Impact of steroids in septic shock requiring low dose norepinephrine

Maryam Abbo, PharmD - Detroit Receiving Hospital
Shannon Blattert, Katri Abraham, BCCCP, Linda Park, PharmD, BCPS

UAN:

Learning Objectives:

1. Discuss the utility of steroid use in septic shock and at what dose of norepinephrine, steroids should be initiated
2. Review current literature and practice guideline recommendations pertinent to the use of steroids in septic shock

Purpose:
Surviving sepsis guidelines suggest corticosteroids should only be initiated when fluid and vasopressor therapy fail to restore hemodynamic stability. Expert opinion suggests that hydrocortisone should only be initiated when norepinephrine doses exceed 0.5 mcg/kg/min, and outcomes are unknown in rates less than this. The purpose of this study is to assess the impact of hydrocortisone on patients with septic shock requiring less than 0.5 mcg/kg/min of norepinephrine.

Methods:
A retrospective study of adult patients admitted to Detroit Receiving Hospital from February 1st, 2012 to June 31st 2018presenting with septic shock and started on a norepinephrine continuous infusion at a rate of 0.5 mcg/kg/min or less. Patients were divided into two groups: 1) those received IV hydrocortisone 50 mg every 6 hours within the first 24 hours of norepinephrine initiation, 2) those who received norepinephrine alone. Exclusion criteria included previous corticosteroid use within 30 days prior to admission, concurrent midodrine, dobutamine, or milrinone. Data collected included: demographics, type of ICU, baseline labs and vitals, microbiological data, severity of illness using SAPS, APACHE II, and SOFA scores, fludrocortisone use, vasopressor administration, renal replacement therapy, mechanical ventilation, and antimicrobial therapy. The primary outcome was number of vasopressor-free days. Secondary outcomes included mortality, time to vasopressor withdrawal, central line-free days, mechanical ventilation-free days, organ failure-free days, ICU-free days, and escalation of vasopressor therapy. Categorical variables will be analyzed using chi-square. Continuous variables will be analyzed using either student's t-test or Mann-Whitney U test. A p-value of

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

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

Evaluation of weight-based dosing of unfractionated heparin in critically ill obese patients

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UAN:

Learning Objectives:

1. Review current dosing recommendations for unfractionated heparin for acute deep vein thrombosis (DVT), pulmonary embolism (PE) and acute coronary syndromes (ACS)
2. Discuss dosing strategies and the effects on patient outcomes for unfractionated heparin in obese patients

Purpose:
Physiologic changes caused by obesity make dosing of medications challenging, including unfractionated heparin (UFH). UFH is dosed using actual body weight for acute DVT, PE and ACS. Dosing UFH in obese patients remains a challenge, potentially leading to prolonged time to therapeutic activated partial thromboplastin time (aPTT). Few studies evaluating the dosing weight of UFH included obese and morbidly obese patients, and even fewer studies included critically ill patients. Thus there is little guidance on how to dose UFH in obese patients.

Methods:
This was a retrospective study of critically ill adult patients treated with weight-based UFH for DVT, PE or ACS between October 1, 2017 and November 30, 2018. The objective of this study was to determine the effect of weight-based UFH dosing in critically ill obese patients on time to therapeutic aPTT. Results were compared between three groups: non-obese (BMI < 30 kg/m2), obese (BMI 30-39.9 kg/m2) and morbidly obese (BMI ≥ 40 kg/m2).

Results:
One hundred and nine patients were included in this study (50 non-obese, 42 obese and 17 morbidly obese). The average time to achieve therapeutic aPTT was 35 hours, 37 hours and 29 hours, respectively (p=0.321). Only 70 patients (64%) reached therapeutic aPTT, 62% in the non-obese group, 69% in the obese group and 59% in the morbidly obese group (p=0.687). There was no significant difference in UFH infusion rate at time of therapeutic aPTT, percentage of subtherapeutic, therapeutic and supratherapeutic aPTT values, bleeding events, or intensive care unit (ICU) and hospital length of stay (LOS).

Conclusions:
No difference was found in time to therapeutic aPTT, infusion rate at time of therapeutic aPTT, bleeding events or ICU and hospital LOS between the groups. However, only 64% of patients treated with UFH ever achieved therapeutic aPTT.

Evaluation of the safety and efficacy of metformin use in hospitalized, non-critically ill patients

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Sarah Petite, PharmD, BCPS, The University of Toledo College of Pharmacy and Pharmaceutical Sciences

UAN:

Learning Objectives:

1. Describe the role of oral agents as alternatives for inpatient management of diabetes.
2. Discuss the significance of factors limiting inpatient metformin use for diabetes management.

Purpose:
The American Diabetes Association recommends insulin as first line therapy for inpatient blood glucose control. Contraindications and precautions to metformin have limited use in the inpatient setting and limited evidence exists evaluating metformin in this patient population. This study aims to determine the safety and efficacy of inpatient metformin use.

Methods:
This study was an IRB-approved retrospective cohort at the University of Toledo Medical Center between June 1, 2016 to May 31, 2018. Adult patients with type II diabetes who received at least one dose of metformin during hospitalization were included. The primary endpoint was to identify hospitalized patients using metformin with at least one contraindication or precautionary warning against its use. Secondary endpoints included assessing efficacy of blood glucose control with metformin, characterizing adverse outcomes of inpatient metformin use, and comparing the efficacy of metformin-containing regimens.

Results:
A total of 200 patients were included. There were 111 patients (55.5%) with 126 cases of potentially unsafe metformin use. The most common reasons were: 94 (47%) age greater than 65 years, 15 (7.5%) heart failure diagnosis, and 12 (6%) metformin given within 48 hours of contrast. Metformin use was contraindicated in two patients (1%) with an eGFR < 30 mL/minute/1.73 m2. The median daily blood glucose in the overall population was 146 mg/dL (IQR 122-181). Patients were then divided into three groups: metformin monotherapy, metformin plus oral antidiabetic therapy, and metformin plus insulin. The median daily blood glucoses were: 129 mg/dL (IQR 110-152), 154 mg/dL (IQR 133-178), and 174 mg/dL (IQR 142-203) (p < 0.001), respectively. Two patients (1%) developed acute kidney injury and no patients developed lactic acidosis.

Conclusions:
Hospitalized patients receiving metformin achieved goal blood glucose levels with limited adverse outcomes. These results support the potential for metformin use in hospitalized, non-critically ill patients.

Safety and Efficacy Comparison of Direct Oral Anticoagulants versus Warfarin Among Venous Thromboembolism Patients with Severe Renal Impairment

Evelina Antypas, PharmD- ProMedica Toledo Hospital/Toledo Children's Hospital
William Kirsch, PharmD, BCPS, Kristen Thomas, PharmD, BCPS , Melissa Flanders, PharmD, Leia Zink, BSPS

UAN:

Learning Objectives:

1. Recall the current guideline recommendations regarding anticoagulation options for the treatment of venous thromboembolism (VTE)
2. Review the literature findings for warfarin and direct oral anticoagulant (DOAC) use in patients with severe chronic kidney disease (CKD)

Purpose:

Chronic kidney disease (CKD) leads to an increased risk of venous thromboembolism (VTE) while also being associated with bleeding complications. Current guidelines recommend warfarin in these patients if oral anticoagulation is warranted; however, recent evidence suggests that direct oral anticoagulants (DOACs) may be a safe and efficacious alternative. DOACs have a high degree of renal elimination, thus, making their use controversial in patients with severe or end-stage CKD. The available literature regarding the use of DOACs to treat VTE in this population is currently limited. Therefore, the purpose of this study is to compare bleeding and thromboembolism rates in patients with CKD stage 4 or 5 with or without dialysis who are taking apixaban, rivaroxaban, edoxaban, dabigatran, or warfarin for VTE.

Methods:

This retrospective, multisite cohort study included patients 18 years or older with evidence of CKD stage 4 or 5 with or without dialysis who received anticoagulation with apixaban, rivaroxaban, edoxaban, dabigatran, or warfarin for VTE for at least 3 months during the time period of November 1, 2016 to November 1, 2018. Patients were excluded if they were pregnant, on anticoagulation for indications other than VTE, had an INR goal outside the range of 2-3 while taking warfarin, or were in acute kidney injury (AKI) and would not otherwise meet CKD stage 4 or 5 criteria. The primary outcome was to evaluate the incidence of major bleeding at 3 months after enrollment. Secondary outcomes included all-cause mortality, minor bleeding, clinically relevant non-major bleeding (CRNMB), ischemic stroke, thromboembolism rates, and emergency room (ER) visits or hospital admission rates due to bleeding, including length of stay (LOS) if admitted.

Results:

Data analysis is ongoing and results will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:

To be presented at the 2019 Ohio Pharmacy Resident Conference.

Evaluating the Potential Role of Statin Therapy in the Reduction of Gentamicin-Induced Nephrotoxicity: A Retrospective Cohort Study

Daniel Arendt, PharmD - PGY-1 Pharmacy Practice Resident with University Hospitals Geauga Medical Center
Mate Soric, PharmD, BCPS

UAN:

Learning Objectives:

1. Explain the mechanism of action of statins and how it relates to their pleotropic renal protective effects
2. Describe the current literature of evidence regarding the utilization of statin therapy to prevent gentamicin-induced nephrotoxicity

Purpose:
Aminoglycosides demonstrate nephrotoxic effects, predominantly related to their uptake via the multi-ligand receptor megalin in the proximal tubule.1 Statin therapy has been shown to decrease receptor-mediated endocytosis by megalin via inhibition of HMG-CoA reductase.2 Additionally, statins have been shown to reduce aminoglycoside toxicity in animal models.3 The primary objective of this study is to determine the overall impact of statin therapy on gentamicin induced nephrotoxicity.

Methods:
This retrospective cohort trial will compare mean change in serum creatinine from baseline to peak in statin using and non-statin using adults receiving gentamicin for at least 4 days within the University Hospitals Health System between January 1st 2008 and September 1st 2018. Patients will be excluded due to Stage 4 or higher CKD, pregnancy, baseline hypotension, dehydration or acute kidney injury.

Results:
Out of 412 patients screened, 41 non-statin users and 27 statin users were identified. Patients using statins were significantly older (67 vs 52 years old, p

Conclusions:
Patients in the statin user group saw a smaller rise in serum creatinine and a lower rate of AKI while receiving gentamicin, although this effect was not statistically significant due to the trial being underpowered. This trial suggests that statins may reduce the extent and rate of gentamicin induced nephrotoxicity. Future studies including a larger number of patients should be utilized to determine if this association is statistically significant.

Impact of Pre-stroke SSRI/SNRI Use on Stroke Severity and Early Functional Recovery

Benjamin M. Ash, PharmD - PGY-1 Pharmacy Resident, Summa Health System
Jessica K. Cather, PharmD, BCPS, BCPP; Philip K. King, PharmD, BCPS

UAN:

Learning Objectives:

1. Outline the postulated mechanisms of brain modulation with serotonergic agents in achieving early functional recovery following an acute ischemic stroke (AIS).
2. Define the National Institutes of Health Stroke Scale (NIHSS) and its clinical application in AIS.

Purpose:
The purpose of this study was to assess stroke severity and early recovery in patients presenting with and without prior use of selective serotonin (SSRI) or serotonin norepinephrine reuptake inhibitors (SNRI) at Summa Health System, Akron Campus (SHSAC). The primary endpoint studied was the impact of preSSRI/SNRI use on baseline stroke severity. Secondary endpoints included the impact of preSSRI/SNRI use on admission mRS, length of stay, mortality, and disposition as well as the effect of re-initiation of SSRI/SNRI on NIHSS and mRS change. Safety was assessed for major/minor bleeding.

Methods:
This retrospective study includes a chart review of patients admitted to SHSAC for AIS. Two study groups were compared (SSRI/SNRI users versus nonusers) by analysis of admission NIHSS. Key exclusion criteria included: tPA intervention and non-SSRI/SNRI prior to admission medications with serotonergic potential. Multivariable linear regression was utilized to generate means and standard deviations for the primary endpoint. Univariate analyses was performed to identify significant baseline differences between the SSRI/SNRI users/non-users dichotomy. Multivariable regression for baseline NIHSS scores was adjusted for baseline characteristic differences yielded by univariate analysis.

Results:
Of 140 included patients, 35 had documented preSSRI/SRNI use. Univariate analysis yielded no statistical significance in admission NIHSS scores between the SSRI/SNRI study group and the control group (5.8 [7.0] vs. 6.6 [7.8]; p= 0.592). Multivariate regression modeling yielded no statistical significance when controlling for baseline characteristic differences. Additionally, safety analysis yielded no difference in frequency of bleeding.

Conclusions:
This study did not find an association with the use of serotonergic agents prior to AIS in reducing stroke severity and/or providing early functional recovery. However, no increased adverse effects were associated with SSRI/SNRIs. Given the incidence of depression post-stroke, it is safe to continue therapy. Additional studies are needed to assess the acute-/long-term clinical impact of SSRI/SNRI re-initiation.

Comparison of a Risk Factor Assessment Tool Versus MRSA PCR Screening in Elective Orthopedic Procedures

Munjal Attawala, PharmD
Lama Hsaiky, PharmD

UAN:

Learning Objectives:

1. Describe surgical site infections and their impact on orthopedic surgeries
2. Review current guideline recommendations on prophylactic antibiotics for orthopedic surgeries
3. Identify the risk factors for methicillin-resistant staphylococcus aureus (MRSA) in orthopedic surgery patients

Purpose:
Compare previously used MRSA risk factor assessment questionnaire with MRSA nasal PCR swab to assess its validity.

Methods:
1. This study will be a retrospective chart review of all patients from August 2015 onwards who had undergone preoperative MRSA nasal screen before their elective orthopedic procedure. Using EPIC, these patients will be screened to see if they have any MRSA risk factors. MRSK risk factors are defined as: Diabetes, Renal dysfunction , Dialysis , Previous hospitalization in last 90 days, Previous antibiotic use in last 90 days , History of skin and soft tissue infection, HIV/AIDS, Obesity (BMI >35), History of MRSA colonization, health care workers, Alternative housing (LTC, Assisted Living, Correctional facility) , or Other immunocompromised conditions (Cochlear implants, cerebrospinal fluid leaks; immunocompromising conditions (chronic renal failure, nephrotic syndrome, HIV, Leukemia, lymphoma, Hodgkin disease, generalized malignancy, solid organ transplant, multiple myeloma), congenital or acquired immunodeficiency (e.g., humoral (B-cell) or T-lymphocyte deficiency, phagocytic disorder), Iatrogenic immunosuppression (e.g., transplant medocatopms. alkylating agents, antimetabolites, long-term systemic steroids, radiation therapy) and functional or anatomic asplenia (e.g., sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, or splenectomy; hypoalbunemia (< 2)).

2. They will also be evaluated for which antibiotics they received, the duration of surgery, antibiotic infusion completion time in correlation to Tourniquet time.

3. The information will be stored on Beaumont Sharedpoint and will only be accessible by investigators involved in the study. The data sheets will be permanently deleted upon preparation of a manuscript and publication.

Eligibility criteria

• Any adult aged 18 or older who had an elective orthopedic surgery at Beaumont Dearborn and had received a MRSA nasal PCR testing.

Exclusion criteria

• Pregnant women, surgeries due to trauma (non-elective), patients with infection at time of surgery.

Results:
Out of the 751 patients included, 162(21.6%) had a positive S. aureus PCR, of which 38(5.1%) were MRSA. There were no statistically significant differences in demographics between non-positive and positive groups: age (67 + 9.8 vs 65 +11.7, P=0.86) and average BMI 33 kg/m2, P=0.91. Pre-operative MRSA assessment tool did not show significant correlation in predicting MRSA colonization. Positive MRSA in the past 12 months had an increased OR of 6.88 (CI 95%, 1.3-35.9) of

having a positive MRSA PCR. Whereas, history of diabetes and hospital stay within 90 days prior to admission had increased OR of 1.45 (CI 95% 0.6-3.3) and 1.37 (CI 95%, 0.5-4.1) respectively, but were not statistically significant. PCR utilization led to an overall vancomycin prophylaxis use of 7.25% compared to 20% predicted use with the assessment tool.

Conclusions:

Previously used risk factor questionnaire is not an appropriate tool to evaluate orthopedic surgery patients for risk of MRSA colonization. Vancomycin use was significantly down as well in orthopedic surgery patients.

Medication Safety in the Neonatal Intensive Care Unit: Assuring Appropriate Dosage Selection for Neonates

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Michael Lucey; RPh, Jessika Richards; PharmD, BCPPS

UAN:

Learning Objectives:

1. Review the importance and necessity for neonatal dosage guidance within the electronic health record
2. Assess the impact of neonatal dosage guidance at Ascension St. John Hospital

Purpose:
Medication errors comprise approximately half of all medical errors in the neonatal intensive care unit (NICU). Multiple regulatory bodies and professional organizations deem miscalculations to be a major cause of medication errors in the NICU. Neonates are vulnerable to medication errors because of their small size and immature organs. The objective of this study is to develop and implement computer physician order entry (CPOE) dosage guidance within the electronic health record (EHR) to reduce the occurrence of neonatal medication-related errors and to assess medication orders for error risk potential pre- and post-implementation.

Methods:
In this quality improvement study, neonatal dosage guidance will be developed and implemented within the EHR for high-risk and high-frequency medications utilized in the NICU at Ascension St. John Hospital. These include medications from the following classes: opioids, benzodiazepines, electrolytes, and antibiotics. Each medication orderable is to contain the following specifications: default weight-based dose (gestational-age, postnatal-age and/or indication specific), automatic activation of dosing calculator, additional guidance in comments, and a standardized “nbs” prefix to create a newborn medication formulary. Additionally, a survey will be completed by providers rotating through the NICU, during a pre-determined month period, pre- and post-implementation to assess trends in prescriber concerns. Pre-implementation neonatal medication errors extracted from the Event Reporting System (ERS) will be used to describe types of medication errors reported in the NICU. To evaluate the potential for neonatal medication errors both pre- and post-implementation, the following yes/no data points will be collected retrospectively and analyzed per 100 medication orders for each orderable: weight-based order, pharmacist modification required, measurable volume, and ordered via orderset. These data points will serve as surrogate markers to compare potential risk of medication errors in both phases.

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

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

Evaluation and improvement of the timeliness of antibiotic administration at a tertiary care VA medidcal center

Rachel Badovick, PharmD, MBA, VA Northeast Ohio Healthcare System
Amy Hirsch, PharmD, BCPS; Mandy Roesel, PharmD, BCPS; Sharanie Sims, PharmD, BCPS; Katherine Salay, PharmD, BCPS

UAN:

Learning Objectives:

1. Discuss the importance of time-sensitive antibiotics being administered to patients in a specified time frame
2. Identify barriers associated with the medication administration process

Purpose:
Delays in antibiotic administration on hospital wards are a common type of medication error that can lead to patient harm and increased healthcare costs. This quality improvement (QI) project was initiated in result of an increase in medication incident reports at the Louis Stokes Cleveland Department of Veterans Affairs Medical Center (LSCDVAMC) related to delayed administration of time-sensitive antibiotic orders, defined as once, now, and stat doses. The purpose of this QI project is to decrease the time to administration of time-sensitive antibiotic orders to ≤2 hours through identifying process defects in the medication administration process and developing, testing, and implementing process improvements. Baseline data collected from July to November 2018 showed the average time to administration of time-sensitive antibiotics was 2 hours and 46 minutes, with only 38.4% of orders ≤2 hours.

Methods:
This QI project will be a continuous evaluation of once, now, and stat antibiotic orders for patients admitted to the general medicine ward at the LSCDVAMC beginning July 15, 2018. The antibiotics to be evaluated encompass a variety of characteristics that may impact the medication administration process including Pyxis stock, non-Pyxis stock, refrigerated, non-refrigerated, restricted, non-restricted, intravenous and oral. For each medication order, documented times of all aspects of the medication process will be collected: prescriber ordering, pharmacy verification, nursing verification, and nursing administration from barcoded medication administration (BCMA) data and the electronic medical record. Time of day and day of the week will also be evaluated as secondary metrics. As needed orders and those ordered in the Emergency Department will be excluded. Improvements will be developed to address process inefficiencies and defects resulting in delayed antibiotic administration.

Results:
Data collection and results are in the process of being analyzed.

Conclusions:
Results and conclusions to be presented at the Ohio Pharmacy Resident Conference.

Impact of antimicrobial stewardship interventions on multicomponent patient outcomes

Emily Beasley, PharmD, PGY1 Pharmacy Resident at The University of Toledo Medical Center
Claudiu A. Georgescu, MD, AAHIVS; Geehan N. Suleyman, MD; Kelli A. Cole, PharmD, BCPS, BCIDP

UAN:

Learning Objectives:

1. Identify categories of antimicrobial stewardship interventions
2. Discuss the value of antimicrobial stewardship interventions performed by pharmacists in an inpatient setting

Purpose:
Prospective audit and feedback (PAAF) is a core antimicrobial stewardship (AS) strategy recommended to improve antimicrobial use. While studies have demonstrated the benefit of PAAF on clinical outcomes in specific disease states or high-risk groups, few have reviewed the broader impact of AS programs that incorporate this strategy. The purpose of this study was to determine the impact of AS interventions on multicomponent patient outcomes.

Methods:
IRB-approved, retrospective cohort including adult inpatients treated with antimicrobials for at least 72 hours at the University of Toledo Medical Center between July 2015-December 2015. Patients readmitted during the study period were eligible for multiple inclusions. Patients with an infectious diseases consultation, on long-term antibiotics, or who were made hospice or comfort care during their admission were excluded. Patients were then grouped according to the presence or absence of a completed AS intervention targeting antimicrobial selection. The primary outcome was the rate of a composite outcome of 30-day all-cause mortality, 30-day readmission, 28-day emergence of antimicrobial resistance, and 90-day Clostridium difficile infection. Secondary outcomes included hospital length of stay (LOS), ICU LOS, days of antimicrobial therapy (DOT), and AS intervention types and acceptance rates.

Results:
338 patient encounters screened, of which 200 were included; 100 with an AS intervention and 100 without. Baseline characteristics were similar between groups except for presence of chronic obstructive pulmonary disease ($p = 0.004$) and diabetes with organ damage ($p = 0.02$). The primary composite outcome occurred less frequently in the intervention group (26% vs. 44%, $p=0.008$), with the greatest difference seen in rates of 30-day readmission (22% vs. 40%, $p=0.006$).

Conclusions:
At our institution, patients who had an AS intervention were found to have fewer negative outcomes compared to those without AS interventions. These results further support pharmacist involvement in patients receiving antimicrobial agents.

Impact of hypoglycemia inpatient protocol at a community hospital

Marissa A. Bellot*, PharmD, PGY-1 Pharmacy Resident, Southwest General
Ashley Brown, PharmD, BCPS, BCPP, Laura Stasiak, PharmD, BCPS

UAN:

Learning Objectives:

1. Recognize the significance of eliminating inpatient hypoglycemia
2. Review proper treatment and management of inpatient hypoglycemia

Purpose:
To evaluate hypoglycemic episodes at a community hospital, identify gaps in hypoglycemia management, and implement a treatment algorithm to prevent recurrent hypoglycemia. This is in anticipation of the Centers for Medicare and Medicaid Services (CMS) new quality core measure involving complete elimination of inpatient severe hypoglycemia, defined as blood glucose less than 40mg/dL.

Methods:
A retrospective analysis was conducted on all adult patients admitted to Southwest General between September 1, 2017 and August 31, 2018 who experienced any hypoglycemic event, defined as a blood glucose less than or equal to 70 mg/dL. A cross sectional method study design was used. Statistical analysis was conducted using logistic regression. The primary outcomes included time to repeat glucose check, documentation of hypoglycemic event, and 30 day readmission rate. A hypoglycemia treatment algorithm was designed and implemented with emphasis on rechecking blood glucose 15 minutes after treatment was administered, documenting hypoglycemic event and treatment given, and special considerations for select patients. After implementation of the protocol, hypoglycemic events were measured and compared to determine effectiveness of the protocol.

Results:
Prior to implementation of the hypoglycemia treatment algorithm,147 hypoglycemia events were reviewed. Of the 147 patients, 26 (17.6%) had an endocrinologist consult while inpatient. Out of the 147 patients that were reviewed, 36 (25%) were readmitted within 30 days. Out of 147 patients, 137 (93%) were on an insulin regimen while inpatient. Of the 147 hypoglycemic episodes included, the majority of them involved no documentation of treatment provided (60.5%).

Conclusions:
This retrospective chart review has provided a significant amount of guidance for specific areas of improvement in hypoglycemia prevention and management at our hospital, which were addressed in an updated hypoglycemia treatment algorithm. Results from the protocol implementation will be presented at the 2019 Ohio Pharmacy Resident Conference.

Efficacy of Levetiracetam for Seizure Prophylaxis in Adults with Intracranial Hemorrhage

Sean Bennett, PharmD - PGY1 Pharmacy Resident, Cleveland Clinic Akron General
Brittany Reed, PharmD, BCPS, BCCCP; Chanda Mullen, PhD; Melissa Fowler, PharmD, BCPS, BCCCP; Jenna Garlock, PharmD, BCPS

UAN:

Learning Objectives:

1. Describe the guideline recommendations for seizure prophylaxis in patients with intracranial hemorrhages
2. Identify medications used to prevent early seizures in adult patients with intracranial hemorrhages

Purpose:
It is common to use prophylactic anti-epileptic medications (AEDs) in adults with intracranial hemorrhage (ICH) in an attempt to prevent early seizures. Current practice trends are shifting towards using levetiracetam as the primary medication for this indication. The purpose of this study was to determine if levetiracetam is effective in preventing early seizures from ICHs, and also to examine the effects of prophylactic levetiracetam on functional outcomes.

Methods:
This was a retrospective, multicenter, cohort study of adult patients with an ICH between October 1st 2017 and September 31st 2018. Patients were included if they had a radiographically confirmed ICH of any subtype, location, or etiology. The patients were grouped into a treatment group of patients who received prophylactic levetiracetam and a control group who did not receive prophylactic AEDs. The primary outcome of the study was the incidence of early seizures. Secondary outcomes included in-hospital mortality, hospital length of stay, and functional status outcomes as measured by a Modified Rankin Scale (mRS) and discharge disposition. Logistic regressions were also performed to associated risk factors with each study outcome.

Results:
A total of 1697 patients were assessed for inclusion and 411 charts were reviewed. Baseline characteristics were significantly different in several criteria. Overall, 8% of patients experienced an early seizure, 12 in the levetiracetam group and 5 in the control group (p=0.073). All early seizure events occurred no later than hospital day four. Use of prophylactic levetiracetam was not associated with a statistically significant difference in any study outcome. The presence of an early seizure was also not identified as a significant risk factor for worse functional outcomes.

Conclusions:
Prophylactic use of levetiracetam did not result in either a significant reduction in early seizures or improved functional outcomes in the patients studied. Further prospective studies are warranted to validate the results of this study.

Improving Performance of a Pharmacy Inventory Management System to Reduce Stock-Outs on High-Use Medications

Christopher Blum, PharmD, VA Northeast Ohio Healthcare System
Amy Hirsch, PharmD, BCPS; Joseph Vescera, PharmD, MBA

UAN:

Learning Objectives:

1. Discuss the importance of an effective inpatient pharmacy management system to support efficient patient care
2. Identify barriers associated with a pharmacy inventory management system and discuss interventions implementing workflow changes to ensure accurate periodic automatic replenishment (PAR) levels

Purpose:
Pharmacy inventory management systems have the potential to save on inventory, expedite workflow, and lead to accurate medication ordering. Currently, the Louis Stokes Cleveland Department of Veterans Affairs Medical Center (LSCDVAMC) utilizes Pharmogistics for its inventory management of the inpatient pharmacy. Since implementation of an inventory management system, our pharmacy has had stocks outs on high-use medications, resulting in emergency ordering, increased costs, inefficiencies, and burden to pharmacy workflow. The purpose of this quality improvement (QI) project is to evaluate current inventory management workflow in order to identify and mitigate current process defects that may be contributing to stock outs and need for emergency ordering of high-use medications. The endpoint is to reduce the number of high-use medication stock outs by the end of March 31st 2019.

Methods:
This QI project will utilize a Lean Six Sigma process improvement approach to evaluate for root causes of stock outs on high-use inpatient medications at LSCDVAMC beginning August 2018. The DMAIC (Define, Measure, Analyze, Improve, Control) framework will be used to determine where defects occur in the inventory management process since the pharmacy inventory management system implementation. The primary metric is the number of stock outs per week of high-use medications. High-use medications will be defined as the top 200 medications ordered by prescribers and dispensed by the pharmacy at LSCDVAMC. Excluded medications will be medications on back-order and not within the top 200 medications ordered and dispensed. Interventions will be identified and implemented using stock-out data from our inventory management system. Once the workflow has been solidified, data will be evaluated to identify inadequate PAR levels. In utilizing this data, the aim is to re-establish periodic automatic replenishment (PAR) levels to ultimately reduce the number of stock outs.

Results:
Data collection and analysis are in process with conclusions to be presented at OPRC

Conclusions:
Data collection and analysis are in process with conclusions to be presented at OPRC

Evaluating the efficacy of Mental Health First Aid (MHFA) training to enhance pharmacy students' knowledge of depression and anxiety

Morgan I. Borders*, PharmD - PGY1 Ambulatory Care Resident, ONU HealthWise
Karen L. Kier, Ph.D., M.Sc., R.Ph., BCPS, BCACP, CTTS, FASHP; Michael J. Rush, PharmD, BCACP, CDE, TTS; Amy M. Fanous, PharmD, BCACP, TTS, Ashley M. Zupancic, PharmD

UAN:

Learning Objectives:

1. Recognize the importance of student knowledge of depression and anxiety
2. Review the efficacy of Mental Health First Aid on student's change in knowledge and confidence to recognize and respond to mental health crises

Purpose:
Student pharmacists may not always be aware of the signs or symptoms of mental illness as pharmacy curriculums focus on the drug therapy, but not necessarily on how to manage an acute episode. Mental Health First Aid (MHFA) is a training that educates on the warning signs of mental illnesses along with methods on how to address acute situations. The primary objective of this study is to evaluate the change in pharmacy students' knowledge of depression and anxiety before and after the MHFA training. The secondary objective is to evaluate the change in students' confidence to apply the MHFA training to someone who displays signs and symptoms.

Methods:
The first 30 students from four pharmacy classes (second to fifth year students) to volunteer were enrolled in the MHFA training. To assess the change in students' knowledge, the researchers administered a pre and post-test of questions based on the MHFA booklet to evaluate their understanding of depression and anxiety and their scaled confidence in helping someone who displays signs and symptoms. Descriptive and inferential statistics were used to analyze the data, including two-tailed t-tests and chi-square tests. The pre to post-test results were compared using paired t-test to determine the impact of MHFA training on student pharmacists' knowledge. Individual questions as well as confidence scores were evaluated using chi-square.

Results:
The primary outcome of change in knowledge improved from the pretest (77.92%) to the post-test (82.86%) with a p

Conclusions:
MHFA training can improve student knowledge of mental illness and enhances their confidence in applying their skills. MHFA training could provide a positive addition to Colleges of Pharmacy curriculums.

Implementation of a clinical decision support software: Are we more productive pharmacists?

Kayla Brackman, PharmD, MBA - PGY1 Pharmacy Resident, The Christ Hospital
Alissa Lee, PharmD, BCPS

UAN:

Learning Objectives:

1. Discuss advantages to use as well as barriers to implementation of a CDSS
2. Discuss strategies to improve implementation and use of a CDSS

Purpose:
The use of clinical decision support systems (CDSSs) in hospitals has demonstrated an improvement in both quality and safety of patient care delivered by pharmacists. Additionally, the use of CDSSs has reduced costs through an increase in the number of pharmacy interventions. The Christ Hospital implemented a CDSS in January 2018 and has since rolled out utilization of the product in phases to various pharmacist roles throughout the hospital. The objective of this study is to evaluate the impact of the system on pharmacy productivity as well as perform a financial analysis to support the ongoing expense of the product.

Methods:
This is a single-center, retrospective study at a large, community teaching hospital. Data will be obtained from April 1, 2018 through November 31, 2018 using the clinical decision support system (CDSS) and electronic medical record (EMR). Productivity data from April 1, 2017 through November 31, 2017 will be used as the historical control. The primary outcome of this study is to evaluate clinical pharmacy productivity by assessing the number of clinical interventions after implementation of the clinical decision support software (CDSS). Secondary outcomes include evaluation of the types of interventions, associated cost savings, expanded scope of clinical coverage, number of non-actionable and unaddressed alerts, impact of pharmacy resident utilization during their weekend staffing commitment, as well as pharmacist perception of the clinical decision support software (CDSS).

Results:
Descriptive analysis will be performed on collected data to characterize the primary and secondary outcomes. Results will be presented at the Ohio Pharmacy Resident Conference.

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

Impact of a pharmacist-led diabetes management clinic in an outpatient internal medicine office

Micaela M. Bresler, Pharm.D. – PGY1 Resident at Mary Rutan Hospital
Karen L. Kier, PhD, RPh, BCPS, BCACP, CTTS – Professor of Pharmacy Practice, Director of Assessment, Director of Drug and Health Information, Preventive Care Specialist for ONU Healthwise Jessi L. Davis, Pharm.D., BCACP – Pharmacy Clinical Manager and Res

UAN:

Learning Objectives:

1. Identify the components of a medication reconciliation (MR)
2. Discuss the impact of pharmacists conducting diabetes education and management on patients in an ambulatory care setting

Purpose:
In Logan County, countless type 2 diabetics (T2DM) are on a host of medications and have low health literacy. Many are unsure what medications they are taking and how to get their diabetes under control. While they may go to several healthcare appointments a year, many providers do not have time to discuss the facets of diabetes. Studies have shown that pharmacists are well suited to perform medication reconciliation (MR) and diabetes education. In fact, pharmacist-led diabetes clinics have shown an increase in medication adherence and decrease in HbA1c and glucose in T2DM. The goal was to spend time reviewing patient's medications and educating them on the disease, how they can control it, medication adherence, and manageable steps they could take moving forward.

Methods:
Patients of the internal medicine office were referred by the care coordination nurse if they were non-adherent and/or a complicated diabetic. At every appointment a pharmacist completed a MR and diabetes education. Recommendations were sometimes made to optimize evidence-based therapy, prevent adverse reactions, and/or address any issues the patient expressed during the appointment. The bulk of the appointment was spent educating patients on diabetes and how they could make small changes that would impact their diabetes over time. At the end of the appointment the patient received two papers: one was a goal sheet that had the changes they were going to implement, and the other was an anonymous survey to assess how the pharmacist provided care. The primary outcome variable was the impact of a pharmacist in educating high risk diabetes patients. The secondary outcome was physician opinion of the pharmacist as part of the team. Descriptive statistics will be used to analyze the data.

Results:
Data is currently being collected and analyzed.

Conclusions:
Results and conclusions will be presented at the 2019 Ohio Pharmacy Residency Conference.

Evaluation of economic and clinical outcome measures for a pharmacist led employee diabetes treatment program

Kaysie Brittenham, PharmD - PGY1 Ambulatory Care Pharmacy Resident - ProMedica Toledo Hospital/Toledo Children's Hospital
Rachel Rocha, PharmD, BC-ADM, CDE

UAN:

Learning Objectives:

1. Describe how medication therapy management (MTM) improves patient outcomes.
2. Identify the benefits of employer sponsored diabetes treatment programs.

Purpose:
Diabetes continues to be a growing issue across the United States. Given the huge economic burden of this disease state, many employers are looking for ways to save money and reduce costs. One potential solution has been employer-sponsored, pharmacist-led medication therapy management (MTM) programs. The purpose of this study was to evaluate the economic and clinical outcomes for the ProMedica Wellness Employee Diabetes Treatment Program.

Methods:
A retrospective chart review was performed between November 2016 and January 2019. The primary outcomes included the change in hemoglobin A1c from baseline to 6 months, as well as, the change in per member per month (PMPM) total medical expenses from 6 months prior to enrollment to 6 months following enrollment. Secondary outcomes included changes in blood pressure, body mass index (BMI), and low-density lipoprotein (LDL) levels. A paired t-test was utilized for evaluation of the clinical and economic outcomes. A p-value less than 0.05 was considered statistically significant.

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

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

Evaluation of the impact of achieving at least 50 percent of target doses of select beta blockers in patients with heart failure on hospitalizations

Emily M Brodict, PharmD - PGY1 Pharmacy Practice Resident, University Hospitals Portage Medical Center
Jaclyn Boyle, PharmD, MS, MBA, BCACP, BCPS - Clinical Pharmacy Specialist, Ambulatory Care, University Hospitals Portage Medical Center

UAN:

Learning Objectives:

1. Recall beta blockers with mortality benefit in patients with heart failure
2. Discuss potential reasons for frequent hospitalizations in patients with heart failure

Purpose:
Patients with heart failure experience frequent hospitalizations due to complicated disease management including patient-specific external factors such as diet and lifestyle choices, and increasing level of care needed for patients who are declining in their health status. The objective of this study is to determine if there is a difference in 6-month hospitalizations between patients on at least 50 percent of the target dose of select beta blockers for heart failure (metoprolol succinate, bisoprolol, and carvedilol) versus those patients on less than 50 percent of the target dose.

Methods:
This study is a retrospective chart review that was conducted at University Hospitals Portage Medical Center from August 2015 to August 2018. Patients at least 18 years of age or older admitted during that time with a diagnosis of heart failure prescribed metoprolol succinate, bisoprolol, or carvedilol at the time of discharge were included. Pregnant women and patients receiving any other beta blocker during the 6 month study period were excluded. Subsequently, study groups were separated into one of two categories: patients receiving greater than or equal to 50 percent of the target dose of the aforementioned medications and patients receiving less than 50 percent of the target dose. The primary outcome was whether or not patients were hospitalized within 6 months from initial admission. Secondary outcomes included overall number of admissions during 6 months, number of 30-day readmissions in 6 months, number of hospitalizations for heart failure in 6 months, and change in beta blocker from admittance to discharge. To meet 80 percent power, 84 patients were enrolled in each group to determine a decrease in 6 month hospitalizations from 60 percent to 36 percent.

Results:
Final results will be presented at the conference.

Conclusions:
Final conclusions will be presented at the conference.

Evaluation of continuous local anesthetic pain ball use in post-cardiothoracic surgery

Hannah Buehrle, PharmD, Rachana Patel, PharmD, BCPS; Julie Falk, PharmD; Linda Lessick, RN,CPHQ; Karen Kier, PhD, MSc, RPh, SCPS, SCACP, TTS; Salil Deo, MD; Jeremy Hoban,MD

UAN:

Learning Objectives:

1. Review The Joint Commission's pain assessment and management standards
2. Evaluate the responses of two pain interventions in patients post-cardiothoracic surgery
3. Analyze data collected to guide pain treatment in post-cardiothoracic surgery patients

Purpose:

The Joint Commission (TJC) updated standards governing pain assessment and management that went into effect January 1, 2018. In the standards, hospitals are recommended to create a pain treatment plan derived from evidence-based practice. Historically, at University Hospitals St. John Medical Center (UHSJMC) continuous local anesthetic pain balls have been utilized in cardiothoracic surgery in an attempt to reduce the use of opioids. Anesthetic pain balls provide a non-opioid pain relief option that releases local anesthetic to the surgical site. Additional pain medications are used as adjunct for breakthrough pain. Recently, UHSJMC has moved away from the use of pain ball in post-cardiothoracic surgery. A retrospective matched cohort review was conducted to evaluate the effectiveness of pain management in post-cardiothoracic surgery with or without a continuous local anesthetic pain ball.

Methods:

A retrospective matched cohort review was conducted from January 2017 through January 2019 of patients who underwent a cardiothoracic surgery. During this time period patients received one of the following pain management regimens: standard of care or standard of care plus continuous local anesthetic pain ball consisting of 550 ml of ropivicaine 0.1% running for 48 to 72 hours. The primary endpoint included the cumulative morphine equivalents at 24, 48 and 72 hours post-cardiothoracic surgery. Secondary endpoints included length of stay from the operating room (OR) to discharge, mean pain scores 24, 48, and 72 hours post-surgery, time to extubation, utilization of other pain medications within 72 hours of surgery, and gastrointestinal (GI) complications related to opioid use. Patients were included if they underwent cardiothoracic surgery defined as coronary artery bypass graft (CABG) with or without a valve replacement, or valve replacement alone. Patients were excluded if they returned to surgery within 24 hours, experienced post-surgical complications of wound infections or pneumonia, had a history of chronic pain or chronic opioid use, or had a length of stay in the ICU ≥10 days. Primary endpoint will be analyzed via a paired t-test. Secondary endpoints will be analyzed via descriptive statistics.

Results:

To be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:

To be presented at the 2019 Ohio Pharmacy Resident Conference.

Total Duration of Antibiotic Therapy in Adults with Community-Acquired Pneumonia requiring Hospitalization

Brett Bushong, PharmD - PGY-1 Pharmacy Resident Mercy Health St. Vincent Medical Center
Deidre Rohaley, PharmD, MBA, BCPS; Aimrie Ream, PharmD, BCACP, BCGP

UAN:

Learning Objectives:

1. Review recommendations for antibiotic duration in community-acquired pneumonia
2. Discuss pharmacist-led antimicrobial stewardship opportunities to decrease excess antibiotic exposure

Purpose:
Community-acquired pneumonia (CAP) is a leading cause of hospitalization and death in the United States. Recommendations from the Infectious Diseases Society of America and American Thoracic Society include using five days of antibiotic therapy with longer than seven days rarely being necessary. However, previous literature reports suboptimal compliance with these recommendations. The purpose of this study was to evaluate the total duration and key elements of appropriate antibiotic therapy in adults with CAP at an academic medical center.

Methods:
This IRB-approved, retrospective chart review evaluated patients diagnosed with CAP requiring antibiotic therapy, admitted to Mercy Health St. Vincent Medical Center (MHSVMC) from September 1, 2017 to March 31, 2018. Exclusion criteria included immunocompromised patients, recent antibiotic use, or a concomitant infection requiring longer therapy. The primary outcome was total duration of antibiotic therapy. Secondary outcomes include days of outpatient antibiotics, antibiotic duplication, appropriate outpatient renal dosing, and median duration of therapy between severe and uncomplicated CAP, as well as between patients ≥65 years old and 18-64 years old. Data analysis included descriptive statistics and Mann-Whitney U tests for secondary outcome comparisons.

Results:
A total of 451 patients were evaluated with 140 patients meeting inclusion criteria. The median duration of therapy was 8 days (interquartile range 6-10) with a median of 5 days of outpatient therapy. Additionally, 58% of patients received >7 days of therapy and 26% received ≥1 day of antibiotic duplication. Furthermore, 94% of patients received appropriate dosage of antibiotics based on renal function. There was no difference in treatment duration between subgroups based on infection severity or patient age.

Conclusions:
The median duration of antibiotic therapy for adults admitted to this institution with CAP was 8 days. Future studies should be completed to evaluate pharmacist-led antimicrobial stewardship interventions in decreasing excessive antibiotic therapy for CAP at MHSVMC.

Evaluation of a pharmacist-driven penicillin allergy assessment on antibiotic prescribing patterns in the emergency department

Samantha Campbell, PharmD
Ellen Immler, PharmD, BCCCP; Pavithra Srinivas, PharmD, BCPS, AAHIVP; Susan Seiti, PharmD; Gregory Hauler, PharmD, BCPS

UAN:

Learning Objectives:

1. Recognize the impact of a reported penicillin allergy on antibiotic prescribing
2. Identify potential outcomes of pharmacist-driven penicillin allergy assessments in the emergency department

Purpose:
The Infectious Disease Society of America endorses allergy assessment as an antimicrobial stewardship tool to optimize antibiotic usage. Approximately 10% of patients in the United States have a self-reported penicillin allergy, and as many as 90% of patients with a history of true IgE-mediated hypersensitivity reaction may be able to tolerate a beta-lactam agent. Cross reactivity rates between penicillins and cephalosporins have been demonstrated to be as low as 0.1-2%, and around 1% with carbapenems. A reported penicillin allergy could lead to use of alternative antibiotics which may increase the risk of antibiotic resistance development, Clostridium difficile infections, and increase health-care costs. We aimed to describe the impact of penicillin allergy assessment on antibiotic prescribing patterns in the emergency department (ED).

Methods:
This is a single-center, retrospective, quasi-experimental study of patients with a documented penicillin allergy receiving antibiotics in the ED at Cleveland Clinic Avon Hospital. The pre-intervention period encompassed March 1, 2017 through August 31, 2017 and post-intervention encompassed March 1, 2018 through August 31, 2018. The intervention comprised a pharmacist in the ED actively performing allergy assessment via chart review and patient interview as well as discussing therapy options with providers at the point of prescription. The primary outcome of this study is the impact of penicillin allergy assessment on antibiotic prescribing patterns in the ED. Secondary outcomes include describing the types of reported penicillin allergies, evaluating the safety of the allergy assessment process, and comparing antibiotic prescribing to a pre-intervention time frame.

Results:
Data analysis in progress

Conclusions:
To be presented.

Incorporation of methicillin-resistant staphylococcus aureus (MRSA) nasal swab to a pharmacy to dose vancomycin (PTD) policy for pneumonia

Kacie Cassell, PharmD - PGY-1 Pharmacy Resident
Rachana Patel, PharmD, BCPS; Melanie Hasel, PharmD; Roberta Persaud, MD; Karen Kier, Ph.D. M.Sc., BCPS, BCACP, TTS

UAN:

Learning Objectives:

1. Describe current practice standards for vancomycin in MRSA pneumonia treatment
2. Discuss the antimicrobial stewardship impact of a the addition of a MRSA nasal swab to a PTD vancomycin policy

Purpose:
Vancomycin is indicated as empiric treatment in many disease states from complicated skin and soft tissue infections to pneumonia, due to its coverage of gram-positive infections, specifically MRSA. As de-escalation efforts are emphasized for antimicrobial management, the nasal swab provides a quick and easy means of interpretation for MRSA pneumonia. A negative MRSA nasal screen provides excellent negative predictability for MRSA pneumonia at 98.5%. Previous studies have shown the use of nasal MRSA swabs in patients with suspected MRSA pneumonia reduced the duration of empiric MRSA-targeted therapy by approximately 1-2 days without increasing adverse clinical outcomes. At University Hospitals St. John Medical Center (UHSJMC), pharmacists are consulted to dose and monitor vancomycin. To improve antimicrobial stewardship, MRSA nasal swab screenings have recently been incorporated into the pre-existing PTD vancomycin protocol. This incorporation allows pharmacists to order MRSA nasal swab, interpret results, and contact the prescriber for therapy de-escalation as part of daily monitoring. The purpose of this study is to evaluate pre and post-implementation of MRSA nasal swab on duration of vancomycin therapy.

Methods:
A retrospective review of patients with pneumonia on vancomycin dosed by pharmacists will be conducted with data from November 2016 to March 2017 (pre-PTD MRSA nasal swab). This data will be compared to patients with pneumonia on vancomycin dosed by pharmacists from November 2018 to March 2019 (post-PTD MRSA nasal swab). A sample size of 40 patients per study group will be required to achieve a power of 80%. The primary objective of this study will be to evaluate the total hours of vancomycin therapy. Secondary objectives will include total number of vancomycin orders discontinued due to negative cultures based on a pharmacist recommendation, potential cost savings, and total number of swabs ordered for pneumonia patients. Patients will be excluded if they are less than 18 years of age, do not have pharmacy to dose vancomycin inpatient order, treated with vancomycin for an indication other than pneumonia or sepsis with pneumonia, or length of stay (LOS)

Results:
Results and conclusions to be presented

Conclusions:
Results and conclusions to be presented

Implementation of pharmacogenomic testing in a community hospital

Melvi Chacko, PharmD - PGY1 Pharmacy Resident, St. Elizabeth Healthcare
Alicia Gesenhues, PharmD, BCOP; Brooke Phillips, MD; Andrea Schumann, PharmD

UAN:

Learning Objectives:

1. Describe the value of pharmacogenomic testing to a healthcare system
2. Discuss implementation of a pharmacogenomic testing pilot program at St. Elizabeth Healthcare

Purpose:
Personalized medicine is a new concept that tailors drug treatment to a patient's genetic makeup. Implementation of personalized medicine is accomplished through pharmacogenomic testing. The purpose of this study is to implement a pharmacogenomic testing service with other healthcare professions. This initiative ensures the right drug is given to the right patient, at the right dose, at the right time.

Methods:
This multi-center, retrospective, cohort study will include patients at least 18 years of age or older with established care at St. Elizabeth Healthcare. Indication for pharmacogenomic testing is provider dependent. This initiative was executed in three phases to address system wide need for pharmacogenomic implementation. The data focuses on patients undergoing testing starting in November 2018. Data collected from the electronic medical record include ordering provider, indication for testing based on order questions, medication(s) associated with pharmacogenomic testing, number of pharmacist interventions documented in chart notes, number of pharmacist consults, and number of therapy adjustments based on pharmacogenomic test results. Pharmacy is routinely consulted to review and provide recommendations for all patients. A survey will be available for patients to assess their experience with pharmacogenomic testing.

Results:
Of 41 patients ordered pharmacogenomic testing, reports for 12 patients are available at time of assessment. Pharmacogenomic testing per patient request occurred in 5/12 patients (42%). Other reasons for testing include failed therapy and previous adverse event. Major depressive disorder was the most common medical condition associated with testing (5/12 consults, 42%). Additional disease states include breast cancer and generalized anxiety disorder. Testing was ordered after documentation of previous failed therapy in 7 out of 12 consults (58%). Changes in therapy based on reports have occurred in 3/12 patients thus far.

Conclusions:
Data collection is ongoing and will be presented later.

Self Learning Questions

1) Which of the following statements accurately describe pharmacogenomic testing?

A) Searches for variations within the genome

B) Provides opportunity to tailor medical treatment

C) Associated with multiple benefits

D) All the above

Answer: D

2) Pharmacogenomics may optimize drug therapy by:

A) Identify patients who may have decreased response to a drug

B) Identify patients who may have increased metabolism of a certain drug(s)

C) Identify patients who may be at risk for experiencing increased toxicity from a drug

D) All of the above

Answer: D

Evaluation of an amiodarone dosing strategy for the prevention of postoperative atrial fibrillation

Megan Chapman, PharmD, MPH, University of Toledo Medical Center
Ashley Schiefer, PharmD, BCPS; Emily McDonnell, PharmD; Kellie Buschor, PharmD, BCPS, BCCCP

UAN:

Learning Objectives:

1. Review current literature and guidelines on the prevention of postoperative atrial fibrillation (POAF) in patients undergoing coronary artery bypass grafting (CABG)
2. Discuss the rates of POAF and adverse events between two different amiodarone dosing strategies for prevention of POAF following CABG

Purpose:
Atrial fibrillation can occur in up to 25-50% of patients following CABG. POAF is associated with longer hospital stays, increased costs, and increased morbidity and mortality. With appropriate pharmacologic prophylaxis, the risk of POAF can be decreased to as little as 5% to 35%. Amiodarone is frequently used to reduce the incidence of POAF in patients who have undergone cardiothoracic surgery and numerous studies have demonstrated its efficacy in this setting. However, various amiodarone dosing strategies have been used and current guidelines provide no guidance for optimal dosing for the prevention of POAF following open-heart surgery. There have also been no studies to date which have compared the efficacy of one amiodarone dosing strategy to another. In September 2017, a new amiodarone dosing strategy was implemented at UTMC. The purpose of this study is to determine if this newly implemented amiodarone dosing regimen significantly decreases the incidence of POAF compared to the hospital's previous standard of care. This information will then better help guide the UTMC cardiothoracic surgery team with the appropriate amiodarone dosing in preventing POAF following CABG.

Methods:
The study is a quasi-experimental retrospective cohort study evaluating the incidence of POAF in patients who have undergone CABG at UTMC between September 1, 2016 to May 1, 2019. Inclusion criteria include age greater than 18 years of age, underwent CABG at UTMC, and initiated on amiodarone prophylaxis as defined in UTMC protocol based on surgery date. Exclusion criteria includes hypersensitivity to amiodarone, bradycardia that resulted in withholding initiation of amiodarone post-operatively, second or third degree heart block, cardiogenic shock, pregnancy, documented atrial fibrillation during hospital stay prior to surgery, liver dysfunction, interstitial lung disease, pulmonary fibrosis, or patients taking amiodarone prior to operation/admission.

Results:
Research is in progress; results and conclusions will be presented at OPRC

Conclusions:
Research is in progress; results and conclusions will be presented at OPRC

Impact of Clinical Decision Support for QTc-Prolonging Medications

Katie M. Chernoby, PharmD- PGY1 Pharmacy Resident Ascension St John Hospital
Stephanie B. Edwin, PharmD, BCPS-AQ Cardiology; Carrie Hartner, PharmD, BCPS, BCCCP; Michael Lucey, PharmD, Michelle Dehoorne, PharmD

UAN:

Learning Objectives:

1. Identify risk factors associated with QTc prolongation
2. Describe the impact of the QTc clinical decision support tool on order verification and adverse events

Purpose:
Hospitalized patients are at high risk of adverse events caused by QTc prolongation. A QTc clinical decision support tool incorporating patient-specific data was recently implemented to improve the value of the electronic alert and thereby prevent complications. The purpose of this study is to evaluate the impact of this clinical decision support tool.

Methods:
This study was a retrospective, quasi-experimental analysis of adult patients at Ascension Southeast Michigan hospitals evaluating the response to QTc alerts. Patients with a pacemaker, automated internal cardiac defibrillator, or comfort care status were excluded. The proportion of continued orders prior to implementation of the new QTc clinical decision support tool (silent phase) will be compared to continued orders in the post-implementation group (active phase). Data associated with the support tool, including the provider's response to the alert, interventions, and provider comments were evaluated. The presence of concomitant risk factors for QTc prolongation were assessed utilizing a validated QTc scoring tool. The frequency of adverse events within 72 hours of the alert were also collected.

Results:
Following implementation of the QTc clinical decision support tool, a 54.6% reduction in orders continued without intervention was noted. In the active phase, 48% of orders were discontinued and 15% were continued with intervention. Electrolyte replacement therapy was the most common intervention chosen by providers in the active phase, occurring in 46.7% of the cases. Most alerts were initially responded to by prescribers, with pharmacist intervention needed in only 33% of cases. QTc-related adverse events were noted to be low in both groups.

Conclusions:
The clinical decision support tool successfully reduced the number of QTc prolonging agents ordered in patients at high risk of adverse events.

Evaluation of a third-shift pharmacy bedside delivery service for emergency department patients using 340b drug discounts

Kevin Chilbert, PharmD
Maria Kahle, PharmD, BCPS

UAN:

Learning Objectives:

1. Identify opportunities to help decrease return visits and readmissions from hospitals
2. Recognize the benefit of bedside delivery service expansion

Purpose:
The purpose of this study was to evaluate the feasibility of implementing a service that provides medications to patients being discharged from the ED during hours in which the current outpatient pharmacy bedside delivery service is unavailable.

Methods:
A single-site, retrospective chart review of patients discharged from the emergency department with written prescriptions at Cleveland Clinic Fairview Hospital was conducted between November 1, 2017 and November 1, 2018. Patients were identified via the electronic medical record during the hours in which the current bedside delivery service isn't offered. The primary objective of this study was to evaluate the hospital specific top 50 ED discharge prescriptions to determine potential revenue generated from leveraging 340b drug pricing against average wholesale prices. Secondary objectives included evaluating if the potential revenue generated would support funding of an additional pharmacist and pharmacy technician in the emergency department for bedside delivery services, and determine if the service will target a true vulnerable patient population based upon geographical demographic data.

Results:
A total of 21,892 patients had prescriptions written to them when the bedside delivery service was not offered. There were a total of 49,938 prescriptions written in the emergency department during this time, and of these prescriptions, the top 50 accounted for 38,176 of them or 76.4 percent. The total potential revenue generated from generated from leveraging 340B pricing was $1,453,772. To evaluate support for additional pharmacists and pharmacy technicians, salaries plus 20%, were subtracted from the total potential revenue totaling $931,137. There were a total of 59.8% of patients with a median household income between $25,000 and $50,000.

Conclusions:
This study demonstrates that an expansion of bedside delivery services to the ED may be both feasible and profitable for hospitals to implement while capturing a truly vulnerable patient population.

Pharmacist led comprehensive medication management services in an outpatient psychiatric clinic

Victoria Cho, Pharm.D., BCPS - PGY2 Ambulatory Care Resident
Ashley S. Brown, Pharm.D., BCPS, BCPP

UAN:

Learning Objectives:

1. Recognize the four categories of medication related needs
2. Describe the differences amongst outpatient behavioral health programs

Purpose:
At Southwest General, there are multiple programs that compose the outpatient mental health services: intensive outpatient program (IOP), partial hospitalization program (PHP), and a chemical dependency intensive outpatient program (CDIOP). Patients are seen either by their primary psychiatrist or a psychiatrist dedicated to these outpatient mental health services employed by Southwest General. Prior to this study, there was no pharmacist involvement in these outpatient programs. In January 2018, the psychiatric pharmacist began rounding weekly with treatment team and led medication education groups in IOP and PHP. The goal of this study was to expand pharmacy services in the outpatient psychiatric programs by providing comprehensive medication management (CMM) into the current workflow.

Methods:
Data was collected on any patient who was newly admitted to IOP or PHP between September 15, 2018 and April 15, 2019. Each patient had the opportunity to review his or her medication list with a pharmacist and ask questions about his or her medications. During this time, the pharmacist reviewed the patient's medication list and identified medication therapy problems (MTPs). The pharmacist also assessed the patient's goals and created medication action plans. Recommendations were communicated to the most appropriate provider given the MTPs identified and the patient's preference. Follow up appointments were made as necessary. This prospective study was classified as a non-human research by the University Hospitals' Institutional Review Board.

Results:
Results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:
Results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Evaluation of Melatonin In Preventing ICU Delirium

Logan Conkey, PharmD - PGY-1 Pharmacy Practice Resident Grandview Medical Center
Nicholas Wolters, PharmD, BCPS

UAN:

Learning Objectives:

1. Describe delirium in the Intensive Care Unit (ICU)
2. Explain the role melatonin may have in preventing delirium

Purpose:
Intensive care unit (ICU) delirium is associated with increased mortality, hospital length of stay, and patient cost. Evidence is available to suggest melatonin may have a relationship in decreasing the incidence of ICU delirium. The purpose of this study is to determine whether prophylactic melatonin administered to patients in the ICU decreases the incidence of delirium compared to patients who did not receive melatonin.

Methods:
A retrospective chart review will be performed on data generated between October 2016 and October 2018. Patients will be included if they are 18 years or older and received melatonin at night while admitted to the ICU. Incidence of delirium will be accessed by CAM-ICU. Patients will be excluded if they were not admitted to the ICU for longer than 48 hours, received melatonin before admission or had delirium upon admission to the ICU. Patient demographics, length of ICU stay, fall rates, antipsychotic use, duration of ventilation, CAM-ICU score, comorbid conditions, melatonin administration details and mortality will also be assessed. We hypothesize prophylactic melatonin treatment will reduce delirium in the ICU by 20% compared to patients who did not receive melatonin. A sample size of 62 in each group will be needed to detect a difference of 20% with 80% power.

Results:
For the primary end-point, patients who were given melatonin in the ICU had a decreased incidence of delirium compared to those who did not (Melatonin 28 of 100 vs. Comparator 44 of 100; p=0.038)

Conclusions:
Patients receiving melatonin in the ICU had a decreased incidence of delirium. However, risk factors for developing delirium remain unclear and the true benefit is unknown.

The implementation of safe workplace practices to ensure compliance with USP General Chapter within a large healthcare system: Educating staff and assessing knowledge and compliance

Logan Conley, PharmD - PGY-1 Pharmacy Resident at Mercy Health St. Rita's Medical Center
Kristi Ziegenbusch, PharmD, BCPS; Lisa Brady, PharmD, MBA

UAN:

Learning Objectives:

1. Explain the many requirements in complying with USP General Chapter .
2. Discuss the various limitations of an implementational project across a large health-system.

Purpose:
With the impending implementation of USP General Chapter "Hazardous Drugs – Handling in Healthcare Settings," compliance with safe handling of the National Institute of Occupational Safety and Health's (NIOSH) list of hazardous drugs will become mandatory in December of 2019. Institutions throughout the country will need to implement appropriate procedures to insure compliance and reduce unnecessary exposure of hazardous drugs to healthcare workers. This project will focus on implementation of new policies and procedures throughout the health system (Bon Secours Mercy Health), to insure compliance with the recommendations in .

Methods:
A review of current policies and procedures regarding hazardous drugs (HDs) at the local and system level will be conducted. These will be updated and revised to include any necessary changes per . Policies to be reviewed will include designation of HD areas, HD receipt and storage, compounding and dispensing, use and maintenance of proper engineering controls, administration, disposal, etc. Assessments of risk (AoR) will be completed for all drugs on the NIOSH list. Review of the AoR will determine what recommendations need made to comply with . AoR and system policies will be reviewed and updated via a working committee consisting of clinical staff throughout the health-system. Competence regarding the NIOSH list and chapter will be assessed for the nursing staff at Mercy Health St. Rita's and the pharmacy staff of the health system. This will be completed via a short 10-15 question examination covering the NIOSH list, USP , and the proper practices regarding handling hazardous drugs. Education regarding these topics will be provided for the same staff to improve knowledge. The same 10-15 question exam will be given post education and again after 30-60 days of procedural implementation. The exam scores will be analyzed to determine the effectiveness of the education and implementation practices.

Results:
Pending

Conclusions:
n/a

Impact of a Chronic Obstructive Pulmonary Disease Exacerbation Order Set on Hospital Length of Stay in a Community Hospital

Nick Coulter*, PharmD, Cleveland Clinic South Pointe Hospital
Melissa Herschman, PharmD, BCPS, Julianne Mazzola, PharmD, BCPS, Lindsey Hoffman, PharmD, BCCCP

UAN:

Learning Objectives:

1. Review guideline recommendations for managing acute exacerbations of chronic obstructive pulmonary disease (AECOPD)
2. Discuss the impact of using AECOPD order sets on patient outcomes
3. Assess the impact of education on an AECOPD order set in a community hospital

Purpose:
AECOPD account for over 600,000 hospital stays annually at a cost of 3.6 billion dollars and are associated with increased mortality. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines provide specific recommendations on the use of steroids and antibiotics in AECOPD to improve patient outcomes. Poor compliance with GOLD guidelines has been associated with increased hospital LOS and increased mortality. Previous studies have demonstrated that use of AECOPD order sets improve guideline compliance. This study evaluated the impact of education on an AECOPD order set on patient outcomes including hospital LOS.

Methods:
This was a single center, retrospective, chart review comparing treatment and outcomes of patients with COPD exacerbations prior to and following education on an AECOPD order set. The study periods were March 1, 2017 to August 31, 2017 and March 1, 2018 to August 31, 2018. Patients were included if they were admitted with a diagnosis code associated with AECOPD, were at least 45 years of age and were not pregnant or incarcerated.

Results:
A total of 399 patients were included, 204 in the pre-education group and 195 in the post-education group. Baseline characteristics were similar between the two groups. The primary outcome was LOS and was 6.0 ± 3.19 days in the pre-education group vs. 5.36 ± 2.97 days in the post-education group. Order set utilization was lower in the pre-education group, 3 (1.5%) vs. 57 (29.2%). Mean daily dose of steroids in prednisone equivalents was higher in the pre-education group103.02 ± 35.42 mg vs. 88.69 ± 37.15 mg. Antibiotic use was also higher in the pre-education group 168 (82.4%) vs. 151 (77.4%) patients.

Conclusions:
There was a trend towards decreased hospital LOS, decreased cumulative steroid dose and decreased antibiotic use in patients with AECOPD following education on an AECOPD order set.

Incidence of Nephrotoxicity in Pediatric Patients Receiving Vancomycin

Caitlyn Crawford, PharmD - Cleveland Clinic Main Campus
Lindsey Glaze, PharmD Michael Spinner, MA, PharmD Elizabeth Neuner, PharmD, BCPS, BCIDP Kaitlyn Rivard, PharmD, BCPS, BCIDP, AAHIVP

UAN:

Learning Objectives:

1. Review pharmacokinetic considerations for pediatric patients
2. Discuss risk factors for nephrotoxicity in pediatric patients receiving vancomycin

Purpose:
Vancomycin is associated with infusion-related toxicities, ototoxicity, and nephrotoxicity. Pharmacokinetic differences in pediatric patients require higher weight-based doses of vancomycin to achieve goal serum trough concentrations. Conflicting results in previous literature leave unanswered questions regarding the association of potential risk factors with the development of nephrotoxicity in patients receiving vancomycin. The aim of study is to determine the incidence of and risk factors for nephrotoxicity in pediatric patients receiving vancomycin at Cleveland Clinic Children's Hospital

Methods:
This retrospective cohort study includes patients ages 28 days to 26 years old admitted to Cleveland Clinic Children's Hospital from June 1, 2015 to July 31, 2018 who received intravenous vancomycin for ≥ 48 hours. Patients with acute kidney injury or receiving renal replacement therapy at time of vancomycin initiation will be excluded. The primary objective is to characterize the incidence of nephrotoxicity in pediatric patients receiving vancomycin. Secondary objectives include: identifying risk factors nephrotoxicity, defining time for nephrotoxicity, and comparing outcomes such as hospital length of stay, intensive care unit length of stay, and in-hospital mortality in patients who develop nephrotoxicity compared to patients who did not develop nephrotoxicity. Analysis will be conducted using the Chi-square test or Fisher's exact test for categorical data and the Mann-Whitney U test for non-parametric data as appropriate. A multivariable logistic regression will identify factors independently associated with nephrotoxicity.

Results:
A total of 329 courses of vancomycin therapy were included in the study, with 20/329 (6.08%) resulting in nephrotoxicity. On univariate analysis, patients who experienced nephrotoxicity were more likely to have higher baseline renal function (median eGFR 201.41 vs 123.90 mL/min/1.73 m2, p=0.001), receive a longer duration of vancomycin therapy (151.83 vs 82.73 hours, p=0.0029), and receive concomitant nephrotoxic medications (70% vs 43%, p=0.011) compared to patients who did not experience nephrotoxicity.

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

Impact of outpatient prescribing of antibiotics for acute exacerbation of chronic obstructive pulmonary disease on 30-day re-exacerbation rates.

Akshith Dass, PharmD
Timothy Brown, RPh, Pharm.D., BCACP, FASHP; Dustin Freshwater, RPh, Pharm.D.; Chanda Mullen, PhD; Bhavin Mistry, RPh, Pharm.D., BCPS, BCIDP

UAN:

Learning Objectives:

1. State current treatment recommendations for acute exacerbations of chronic obstructive pulmonary disease (AECOPD)
2. Discuss the impact of treating AECOPD in the outpatient setting with antibiotics

Purpose:
Acute exacerbations of chronic obstructive pulmonary disease (AECOPD) are associated with accelerated respiratory decline, decreased quality of life, and increased mortality. The benefit of the use of antibiotics for the treatment and prevention of exacerbations in the outpatient setting is inconsistent. The primary objective of this study is to describe the incidence of a re-exacerbation of COPD within 30 days in patients prescribed antibiotics compared to those not prescribed antibiotics after a visit to an outpatient primary care clinic for an AECOPD. The secondary objectives are to determine the incidence of re-exacerbation within 90 days and the risk factors of re-exacerbation.

Methods:
This was a retrospective cohort chart review of primary care patients with an AECOPD. Inclusion criteria were patients at least 50 years of age, prescribed greater than 5mg of prednisone or equivalent, and the presence of maintenance medications for COPD. Exclusion criteria included pregnancy, use of leukotriene receptor antagonists or cromoglycates, and presence of active neoplasm or cystic fibrosis. Risk factors assessed included demographics, previous exacerbations, maintenance medications for COPD, vaccine history, and the type of provider for the study visit.

Results:
A total of 88 patients were included of which 67% received an antibiotic. The proportion of patients with a re-exacerbation of COPD within 30 and 90 days was lower in the group which received an antibiotic (30 days: 14% vs 31%, p = 0.051; 90 days: 31% vs 35%, p = 0.71). A history of AECOPD was the only significant risk factor for a re-exacerbation within 30 and 90 days (30 days AOR 1.77 [95% CI 1.19 – 2.64], p = 0.05; 90 days AOR 2.03 [95% CI 1.40 – 2.94], p < 0.001).

Conclusions:
This study adds to the inconsistency seen in the literature regarding the benefit of antibiotics for the reduction of re-exacerbations of COPD.

Fluid resuscitation and associated outcomes in septic patients at risk for fluid overload

Kelly M Davidson, PharmD PGY2 Critical Care Pharmacy Resident University of Toledo Medical Center
Christina M DiCola, PharmD Candidate; Kellie N Buschor, PharmD, BCPS, BCCCP Critical Care Clinical Pharmacist

UAN:

Learning Objectives:

1. Identify septic patients who may be at risk for inadequate fluid resuscitation.
2. Review supporting literature behind the 30ml/kg fluid resuscitation recommendation from the Surviving Sepsis Campaign.

Purpose:
The Surviving Sepsis Campaign recommends 30 ml/kg intravenous crystalloids as a first-line treatment for sepsis-induced hypoperfusion. Although a strong recommendation, the recommendation is backed by low quality evidence. Expert consensus and observational analyses selected out 30 ml/kg as the recommended fluid resuscitation, but no controlled analyses to date have confirmed the appropriateness of this specific recommendation. Patients with heart failure or chronic kidney disease are more sensitive to fluids and can experience complications from fluid overload more easily. Considering patients with heart failure or chronic kidney disease who present with sepsis or septic shock, the literature determining optimal fluid resuscitation is even sparser. The objective of this study is to determine if ≥ 30 ml/kg fluid resuscitation in sepsis and septic shock impacts clinical outcomes in patients with underlying heart failure or chronic kidney disease compared to patients with underlying heart failure or chronic kidney disease who receive < 30 ml/kg fluid resuscitation.

Methods:
This is a single center retrospective comparative cohort study. Patients 18 years of age and older with sepsis and septic shock and underlying heart failure or chronic kidney disease will be eligible for inclusion. Patients will be selected retrospectively from August 1, 2016 through July 31, 2018. The primary outcome is a composite of new renal replacement therapy requirement and new mechanical ventilation requirement. Secondary outcomes include 28 day mortality, new renal placement therapy requirement, new mechanical ventilation requirement, and length of stay.

Results:
86 patients were eligible for inclusion in the study. 61 patients were excluded, leaving 25 patients included for study analysis.

Conclusions:
Data analysis is currently ongoing with final results to be presented at the 2019 Ohio Pharmacy Resident Conference.

Conversion to a Central Order Processing Model: Impact on Turnaround Time, Clinical Outcomes, Employee and Patient Satisfaction

Emily J. Davis, PharmD
Russell W. Smith, PharmD, MBA, BCPS; Varun A. Vaidya, PhD

UAN:

Learning Objectives:

1. Describe the impact of the conversion from a de-centralized to a centralized order processing pharmacy model.
2. Identify areas of benefit from the conversion of pharmacy models.
3. Recognize further optimization needed for the centralized order processing pharmacy model.

Purpose:

Before June 2018, the pharmacy practice model at the University of Toledo Medical Center was a de-centralized model whereby pharmacists provided order entry and clinical services on a floor-based approach and dispensing was the primary focus of central pharmacy. On June 1, 2018 this model changed to a central order processing model whereby all order entry and dispensing functions were allocated to central pharmacy to allow floor pharmacists to provide dedicated, clinical services to rounding hospitalist teams. The purpose of this study is to assess the impact of this conversion on medication turnaround time, clinical outcomes, employee and patient satisfaction.

Methods:

This study is a retrospective cohort study with the following outcomes: total medication turnaround time, length of stay, number of readmissions, number of pharmacist interventions, medication error rates, pharmacist job satisfaction, and patient satisfaction. Patients were eligible for inclusion if they were at least 18 years of age and they were inpatient status at the University of Toledo Medical Center between January 1, 2018 and November 1, 2018. Up to 10,000 patients and 20 pharmacists were identified to participate. The baseline patient characteristics include: gender, age, race, zip code of residence, and comorbidities (using Case Mix Index). Student's T-tests will be conducted to compare averages before and after the model changes. These variables will include medication turnaround time, length of stay, number of readmissions, and number of pharmacist interventions. Chi-square tests will be conducted to compare medication error rates and pharmacist and patient satisfaction survey responses.

Results:

Statistical analysis is in progress. The results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

The conclusion will be presented at the Ohio Pharmacy Resident Conference.

PHARM-HF: Effect of Pharmacist Interventions in an Outpatient Clinic on 30-day Readmission Rates for Heart Failure

Lisa Do, PharmD, BCPS - PGY2 Ambulatory Care Resident at St. Rita's Medical Center
Staci R. Dotson, PharmD, BCPS, BCACP, BC-ADM and Debra L. Parker, PharmD, BCPS, CACP, CLS

UAN:

Learning Objectives:

1. Identify areas in which pharmacists can make interventions in a heart failure clinic
2. Discuss opportunities that will optimize the impact of pharmacists and medication management in a heart failure clinic

Purpose:

Heart failure (HF) affects approximately 6 million adults in the US and was the leading cause of 30-day readmissions for Medicare patients in 2017. Mercy Health St. Rita's HF readmission rate from January to September 2018 was 24%, which is higher than the Centers for Medicare & Medicaid Services national rate of 21.4% from July 2015 to June 2016. Pharmacists can help fill gaps in care by maximizing education related to efficacy and safety and assisting to optimize associated medication therapy. The purpose of the study is to evaluate the impact of pharmacist interventions on 30-day HF readmission rates.

Methods:

This is an institutional review board approved, single-center, cohort study. There are two patient groups: a historical control group and a prospective intervention group. The historical control group was comprised of patients whose care was managed at a cardiology clinic by a physician and nurse practitioner prior to the addition of a pharmacist. The control group was retrospectively screened for 30-day HF readmission rates from January to September 2018. The intervention group was comprised of patients seen between October 2018 and February 2019 with the additional care of a pharmacist in the same cardiology clinic. The pharmacist's contributions included the following: medication reconciliation, counseling, titrating medication doses, and recommending medication interventions according to American College of Cardiology/American Heart Association (ACC/AHA) guidelines. Patients were eligible for inclusion: if they had a signed informed consent (intervention group) and admission with HF diagnosis (ICD-9 diagnosis code 428 and/or ICD-10 diagnosis code I50). Pregnant patients were excluded. The primary outcome was 30-day HF readmission rates. The secondary outcome was the number of pharmacist interventions.

Results:

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

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference.

Antimicrobial Stewardship Implications of the Nasal MRSA PCR Swab

Bianca Dodgen, PharmD, PGY-1 Pharmacy Practice Resident, Grandview Medical Center
Julia Landis, PharmD, BCPS

UAN:

Learning Objectives:

1. Recall the incidence and mortality of MRSA pneumonia
2. Evaluate different clinical decision making tools used in the treatment of pneumonia
3. Describe the mechanism of resistance detected by the MRSA PCR swab
4. Review the results of the resident research project

Purpose:
Pneumonia caused by methicillin resistant staphylococcus aureus (MRSA) is associated with low incidence, but high morbidity and mortality. This often leads clinicians to add empiric coverage with vancomycin. However, vancomycin is associated with great cost. Grandview Medical Center is a 300-bed hospital that recently implemented a pneumonia order set in which a MRSA nasal swab is pre-checked and performed with associated vancomycin orders. The MRSA PCR nasal swab helps to rule out MRSA as a causative pathogen. The nasal swab is a minimally invasive test that results in four hours and is associated with a high negative predictive value when used in patients diagnosed with pneumonia. This allows clinicians to rule out MRSA and stop vancomycin earlier than if traditional cultures were used. The purpose of this study is to determine if the implementation of the MRSA nasal PCR swab will influence clinical outcomes.

Methods:
A retrospective chart review will be performed on data generated between October 2017 and October 2018. Patients over 18 years of age that have an DRG code for pneumonia and have received vancomycin or linezolid will be included. Patients will be excluded if they have a MRSA infection elsewhere, if their latest PCR nasal swab done more than 21 days ago, or if they have had previous nasal mupirocin use. The patient's laboratory data will be reviewed, along with length of antibiotic therapy, thirty-day readmission, mortality during admission, demographic data, type of pneumonia, respiratory and blood culture data, PCR result, influenza status, history of injection drug use, ventilator status, temperature, comorbidities, and PCR result. We hypothesize anti-MRSA therapy will be reduced by 24 hours with the implementation of the MRSA PCR nasal swab. A sample size of 36 in each group will be needed to detect a difference of 24 hours with 80% power.

Results:
Average vancomycin duration was 3.3 days in the MRSA PCR group vs 4.2 days in the non-MRSA PCR group (p=0.007). ICU Admission was 42% in the MRSA PCR group vs 55% in the non-MRSA PCR group (p=0.164). Mortality was 6% in the MRSA PCR group vs 10% in the non-MRSA PCR group (p=0.497). 30-day readmission was 30% in the MRSA PCR group vs 21% in the non-MRSA PCR group (p=0.305). Negative predictive value was 100%.

Conclusions:
Implementation of the MRSA nasal swab resulted in a statistically and clinically significant difference in vancomycin time

Evaluation of a pharmacist-driven medication reconciliation and delivery service

Charles Dorflinger, PharmD, VA Northeast Ohio Healthcare System
Amy Hirsch, PharmD, BCPS Alexa Petrarca, PharmD, BCPS Diana Walick, PharmD, BCPS Christy Marchiando, PharmD, BCPS Sarah Augustine, MD Michael Hicho, PharmD, BCPS

UAN:

Learning Objectives:

1. Discuss the benefits of pharmacist involvement in the discharge process
2. Identify possible defects and solutions in a meds to beds discharge process

Purpose:
Meds to Beds is a pharmacist-run service that provides medication reconciliation, counseling, and bedside delivery of medications upon discharge. There are potential inefficiencies in the process which may lead to decreased patient satisfaction, negative health outcomes, and delays in discharge. The purpose of this quality improvement project is to decrease time from discharge order to medication delivery.

Methods:
Retrospective data was utilized to establish the process baseline. Interdisciplinary team meetings with stakeholders were conducted to identify barriers in discharge. Based on this information, process improvements were made and post-intervention data was collected. Patients discharged from a single general medicine unit and eligible for medication delivery were included. Progress notes were used to determine the time from discharge order to medication delivery (discharge time). Minitab Statistical Software® was used for descriptive and statistical analyses.

Results:
Baseline data was collected from June 2018 to July 2018. The established workflow was not followed in 249 of 1330 (18.7%) instances, and discharge time was an average of 72 minutes. To account for staffing changes, baseline discharge time was re-evaluated in January 2019, and it was found to have decreased to an average of 53.1 minutes. Using this data, an interdisciplinary team determined that medical resident knowledge of discharge workflow was attributing to increased discharge time. A comprehensive educational program was enacted on January 31, 2019. This education program included standardized, pharmacist-led senior resident training and an intern resident workflow question and answer session in addition to educational posters displayed in medicine service team work rooms. One-month post-intervention, discharge time was an average of 58.9 minutes (p>0.05).

Conclusions:
One month of data post-intervention showed no decrease in discharge time. Further analysis over time may be warranted.

Advancement of pharmacy services in a community hospital setting through the development of a culture review policy and procedure for urine cultures

Theodore J. Dorow, Pharm.D., St. Elizabeth Healthcare
Elizabeth L. Giordullo, Pharm.D., BCPS, BCCCP; Alyssa M. Penick, Pharm.D., BCPS; Deanna J. Fliehman, Pharm.D., BCPS

UAN:

Learning Objectives:

1. Review appropriate treatment for urinary tract infections and previous studies examining pharmacist interventions on urine cultures
2. Describe the impact of pharmacist review of urine cultures on patients discharged from the emergency department

Purpose:
In 2013, there were approximately 2.3 million emergency department (ED) visits for urinary tract infections (UTIs) in the U.S. Multiple studies have evaluated the impact that pharmacists have on the treatment of UTIs in the ED. Pharmacist interventions have been shown to increase guideline adherence, provide recommendations based on ED-specific antibiograms, and save up to 29% of total prescribed antibiotic days for inappropriate treatment of asymptomatic bacteriuria. Lastly, a similar study to the current one showed that nursing management intervened on 50% of positive cultures that required an intervention versus 80% with pharmacists.

Methods:
We conducted a retrospective review of patients discharged from the ED with a positive urine culture between December 1, 2016 to January 31, 2017, where nursing staff was solely involved with follow up and December 1, 2018 to January 31, 2019, where pharmacists oversaw follow up. Patients

Results:
There were 99 and 97 urine cultures included in the pre and post-intervention groups, respectively. There was a statistically significant difference in time to follow up, duration of antibiotic prescription and guideline adherence for duration of prescription (P

Conclusions:
Pharmacist review of urine cultures for patients discharged from the ED provided a significant difference in time to follow up, duration of antibiotic prescription and guideline recommended duration for treatment of UTIs. Pharmacists followed up on all urine cultures in the post-intervention group. Additional studies are needed to determine the impact pharmacists can have on other positive culture results.

Patient Preferences Regarding Vaccinations Administered By Pharmacists vs Registered Nurses at MetroHealth Outpatient Clinics

Emily Doycich, PharmD- PGY1 Resident The MetroHealth System
Mary Ann Dzurec PharmD BCACP; Brian Colbert PharmD

UAN:

Learning Objectives:

1. Review background literature related to pharmacy-based vaccination services
2. Explain observed differences in populations choosing to receive needed vaccinations at the pharmacy versus a nurse clinic

Purpose:

Background Current literature supports satisfaction with pharmacy vaccination services, although bias may be present. These studies do not explain what motivates patients to choose a pharmacy over their doctor's office for immunizations.

Purpose: The primary objective was to measure patient perceptions regarding vaccinations from a pharmacist or registered nurse at respective MetroHealth clinics. Secondary objectives include determining correlations between demographic information and patient perceptions, level of satisfaction, setting, or physical location.

Methods:

Methodology: This was a prospective, multi-site, cross-sectional study performed at eight MetroHealth locations. Non-pregnant, English-literate adult patients were surveyed about demographics, perception, level of satisfaction, site location and setting. Statistical analyses were performed using Mann-Whitney U Tests.

Results:

Results: There were 226 pharmacy surveys and 35 nurse clinic surveys included. No significant differences in baseline characteristics were observed except for location of prescription pickup, those vaccinated at MetroHealth pharmacies were also more likely to fill their medications at MetroHealth pharmacies ($p= 0.00094$). No significant difference in location observed between groups regarding comorbidities where vaccinations are CDC-recommended. No significant difference in location observed regarding influenza vaccination ($p=0.05744$). Pharmacies administered significantly more shingles vaccines ($p=0.01684$) and had more patients complete additional tasks ($p=0.0088$). Nurse clinics administered significantly more other included vaccines ($p=0.00018$). No significant differences were observed when correlating demographics to patient comfort and satisfaction.

Conclusions:

Conclusions: These preliminary data should be interpreted with caution due to the heavier weighting of pharmacist responses; bias may be present. Results support current satisfaction at both MetroHealth pharmacy and nurse clinic locations. Significant findings show those visiting the pharmacy are more likely to complete additional tasks during their visit, suggesting convenience as a potential motivating factor to receive vaccine from pharmacy.

Consultant Pharmacist driven, Pharmacogenomic-Directed Antipsychotic Medication Therapy in Older Adults in Long-Term Care Population

Janetta Emmelhainz, PharmD - Pharmacy Resident, University of Cincinnati
Joshua Postolski, PharmD; Bethanne Brown, PharmD, BCACP; Kaylee Mehlman, PharmD, BCGP

UAN:

Learning Objectives:

1. At the conclusion of this activity, pharmacists will be able to assess patients to determine who may benefit from pharmacogenomic testing to direct antipsychotic therapy.
2. At the conclusion of this activity, pharmacists will be able to identify potential barriers to the adoption of pharmacogenomic testing in practice.

Purpose:

Older adults are at higher risk of experiencing adverse effects from antipsychotic medications, including therapy-limiting and serious side effects including stroke and sudden death. Genetic variations are linked to both likelihood of response to medication and risk of adverse effects. Pharmacogenomic testing may improve outcomes through quicker selection of initial appropriate therapy, reducing pill burden, and decreasing healthcare cost. Currently, studies in older adults are limited to case series, and pharmacogenomic testing is generally underutilized, even though it is covered under Medicare. The purpose of this institutional review board approved study is to determine the impact of a consultant pharmacist driven, pharmacogenomic-directed intervention on antipsychotic therapy in older adults in a long term care population.

Methods:

Patients in a long-term care facility were assessed by a consultant pharmacist for antipsychotic polypharmacy, high dose antipsychotic therapy, or documented treatment failure within 12 months. Recommendations for pharmacogenomic testing with GeneSight were submitted to the psychiatric nurse practitioner managing their care. Once completed, the consultant pharmacist will assessed each patient's genetic report to determine if significant gene-drug interactions were present with the current regimen. If appropriate, the consultant pharmacist recommended changes to antipsychotic therapy to reduce drug-gene interactions. Patient outcomes tracked include: antipsychotic regimen, concurrent psychoactive medications as defined by CMS Mega Rule 483.45, and documented adverse effects and emergency room visits collected at 3 months and compared to baseline.

Results:

Data collection and analysis are in progress. Verbal orders for GeneSight obtained for 28 patients. Baseline demographics of this population include: 35.7% female, mean age 66.5 years [49 to 84], 96.4% diagnosed with schizophrenia or schizoaffective disorder and 71.4% on multiple antipsychotics [mean 1.75 medications].

Conclusions:

Complete results and conclusions will be presented at the Ohio Pharmacy Resident Conference in May 2019.

Pharmacy operations advancement through the use of time studies

Eric Enzweiler, PharmD - PGY1 Pharmacy Resident, Saint Elizabeth Healthcare
Eric Nordman, PharmD, MBA

UAN:

Learning Objectives:

1. Describe the utilization of time studies in assessing productivity and efficiency
2. Identify factors for consideration when modifying workflow operations

Purpose:
Pharmacist and technician workflow in the hospital must be efficient while protecting patient safety and avoiding unnecessary costs. Unnecessary costs may stem from excessive staffing and overestimation of work burden. Alternatively, efficiency is compromised if employment is insufficient to provide coverage for all tasks that must be completed. Additionally, pharmacists and technicians have unique skill sets which should be identified when distributing activities to be performed. The Practice Advancement Initiative (PAI) from the American Society of Health-System Pharmacists (ASHP) details goals of pharmacist and technician performance. This project seeks to improve optimization and standardization of pharmacist and technician workflow while achieving the goals set forth in the ASHP PAI.

Methods:
In order to determine pharmacist and technician workflow, observational time studies are performed by researchers as they shadow various pharmacists and technicians during pre-selected times and shifts. Data is also collected by performing work sampling, a method where employees used a self-reporting checklist to document activities they are performing every 10 minutes. Additionally, standardization across 3 hospitals will be attempted by using surveys to report similarities and differences between facilities. After data analysis, interventions will be made to optimize and standardize workflow.

Results:
Research is in-progress.

Conclusions:
Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Impact of a three-month series of pharmacist-led hypertension management appointments on blood pressure in underserved patients

Amber Etzel, PharmD- PGY-1 Community Pharmacy Resident at University of Cincinnati College of Pharmacy
Lori Sublett, PharmD; Quentin Norman, PharmD; Jonathan Burns, PharmD; Bethanne Brown, PharmD, BCACP

UAN:

Learning Objectives:

1. Discuss the impact of clinical pharmacy hypertension educational appointments in an FQHC setting using data from a retrospective chart review
2. Review limitations experienced when conducting a residency research project in an underserved patient population

Purpose:
To determine if pharmacist-led, standardized educational appointments decrease blood pressure in underserved patients compared to those receiving usual care.

Methods:
This is a multi-site, case-control, retrospective study in a federally qualified health center (FQHC). The primary outcome is number of patients with a blood pressure at goal (130/80 mmHg seen by pharmacist after 11/15/2018. Control Group: average aggregate blood pressure of all patients diagnosed with hypertension (HTN) with two consecutive blood pressures >130/80 mmHg on 11/1/2018 and 2/1/2019. Appointments were scheduled as 30-minute face-to-face visits every four weeks for three months with follow-up phone calls every two weeks. Demographic data was collected at visit one. At each visit, clinical data was recorded including: blood pressure, body mass index (BMI), heart rate, and current lifestyle habits. During visits, pharmacists using a standardized HTN toolkit provided education on hypertension and non-pharmacologic therapies as well as recommendations for medication therapy optimization.

Results:
The control group consists of 2,405 patients with average blood pressure readings of 142/86 and 137/86 mmHg respectively. Intervention group currently consists of 17 patients who have been seen for an average of 1.2 visits with a mean baseline blood pressure reading of 155/95 mmHg (130-200/80-121). Other baseline characteristics include 64% female, average age of 51 years (39-83), BMI 38.87 kg/m2 (26.3-56.7), heart rate 78 bpm (45-103), number of blood pressure medications per person 1.8 (0-4), and currently smoking 36%.

Conclusions:
To date, only 17 of the 50 patients needed to determine effectiveness have been enrolled. Their average baseline blood pressure is significantly higher than the control group. Data collection and enrollment is ongoing.

Filgrastim use in solid organ transplant patients at a large academic medical center

Josh Eudy, PharmD, Cleveland Clinic - Main Campus
Kelly Gaffney, PharmD; Michael Spinner, MA, PharmD; Jessica Bollinger, PharmD, BCPS; Richard Fatica, MD

UAN:

Learning Objectives:

1. Review risks and treatment strategies for neutropenia in solid organ transplant (SOT) recipients.
2. Discuss available literature for the use of filgrastim in SOT recipients.

Purpose:
Neutropenia in SOT recipients can result from pharmacological therapies and possibly lead to infection. Strategies to resolve neutropenia include reducing contributing immunosuppressive or antiviral agents, but this can lead to graft rejection and poor outcomes. Filgrastim, a granulocyte-colony stimulating factor, has been used as a treatment option for neutropenia in SOT recipients, but supporting data for its efficacy and safety in this population is limited. This limited evidence, high cost, and increasing use at our institution resulted in formulary restrictions for filgrastim use in SOT recipients in April 2018. This study aims to evaluate the utilization of filgrastim under new formulary restrictions and resulting outcomes for SOT recipients.

Methods:
This is a single center, retrospective study evaluating inpatient SOT recipients who received at least one dose of filgrastim between April 24 and October 24, 2018 at Cleveland Clinic-Main Campus (CCMC). Exclusions were indications unrelated to SOT. The primary objective was to describe filgrastim utilization following formulary restriction implementation. Secondary objectives were to describe ordering adherence and efficacy for filgrastim.

Results:
From identified orders, 89 (29%) filgrastim doses met all formulary restriction criteria. However, 146 (50.9%) doses met clinical criteria defined as an ANC ≤ 1,000 cell/mm3 and a dose of ≤5 mcg/kg. Overall mortality during the study period occurred in 10 (18%) patients and neutropenia or leukopenia resolution occurred in 29 (37%) encounters with a median time of 3.13 [IQR 1.1-4.5] days after a median number of 1 dose [IQR 1-3].

Conclusions:
The preliminary results suggest that current restriction criteria are not being followed. However with higher rates of clinical appropriateness, modifications to the criteria are likely necessary. Median resolution occurred in 3.1 days after 1 dose suggesting filgrastim should continue to not be scheduled. Future directions include evaluation of pre-/post-restriction mortality and re-evaluation of ANC cutoffs for individual SOT services.

Evaluating use of direct oral anticoagulants (DOACs) in patients with cardiac thrombus

Maggie Faraj, PharmD, PGY1 Pharmacy Resident Detroit Medical Center
Elizabeth Petrovitch, Pharm.D., BCPS; Natalia Jarbou, Pharm.D. Candidate

UAN:

Learning Objectives:

1. Describe the safety and efficacy of direct oral anticoagulants compared to warfarin in patients with an intracardiac thrombus
2. Recommend an oral anticoagulant for the treatment of an intracardiac thrombus

Purpose:
The goal of the study was to evaluate the safety and efficacy of DOACs compared to warfarin in patients with an intracardiac thrombus. The efficacy endpoint is thrombus resolution, and the safety endpoint is major and minor bleeding.

Methods:
This was an Institutional Review Board approved retrospective study conducted at the Detroit Medical Center. Patients between the ages of 18 and 89 years who had a confirmed diagnosis of cardiac thrombus either by TTE or TEE were eligible for inclusion in this study. They had to be admitted to an adult DMC hospital between January 1st, 2012 and July 31st, 2018 and discharged on an oral anticoagulant. Data was collected using the hospital's electronic medical record to include comorbidities, concomitant medications, laboratory values, diagnostic test results, as well as prescribing patterns and it was used to evaluate the efficacy of DOACs for resolution of thrombus. The safety of DOACs compared to warfarin was assessed by evaluating minor and major bleeding, in hospital and 90-day mortality. Patients were followed for up to 1 year from their initial discharge with cardiac thrombus. All nominal data was evaluated using Chi-squared test and continuous data was analyzed using the Student's t test.

Results:
A total of 168 patients with cardiac thrombus were evaluated, 50 in the DOAC group and 118 in the warfarin group. A total of 42 out of 50 patients (84.0%) in the DOAC group were readmitted within 12 months from index event, as compared to 96 out of 118 patients (81.4%) in the warfarin group (p= 0.68), primary outcomes were evaluated in this group. The efficacy outcome occurred in 69.0% of DOAC patients, as compared to 81.8% of warfarin patients. DOACs were noninferior to warfarin (p= 0.16) for thrombus resolution. Rates of bleeding were similar in the two groups. Major bleeding occurred in 19.0% of DOAC patients, as compared with 31.3% of warfarin patients (p= 0.14). While minor bleeding occurred 2.4% of DOAC patients, as compared to 1.0% of warfarin patients (p= 0.54). The patients in the DOAC group were discharged on either apixaban (56%) or rivaroxaban (44%) for treatment. Dosing regimens varied with a small proportion of patients (24%) receiving VTE treatment dosing regimens.

Conclusions:
Use of DOACs was noninferior to conventional therapy with warfarin for the treatment of cardiac thrombus and was not associated with more bleeding.

Efficacy of Intravenous Lidocaine Compared to Morphine for the Treatment of Pain in the Emergency Department

Adam Fife, PharmD - PGY-1 Pharmacy Resident Cleveland Clinic Euclid Hospital
Sean Hackett, PharmD, BCPS; Gregory Hauler, PharmD, BCPS ; Matt Hoover, PharmD, MS, BCCCP, BCPS; Seth Podolsky, MD, MS, FACEP ; Baruch Fertel, MD, MPA, FACEP

UAN:

Learning Objectives:

1. Describe the current prescribing practices for analgesics in the emergency department (ED) and the current opioid epidemic
2. Discuss the system-wide protocol for the use of lidocaine as an analgesic

Purpose:
Pain is the most common complaint in patients who present to the emergency department, and opioids are one of the most common drug classes used for analgesia. Given the highly addictive qualities of opioids, there is a need to use non-opioid alternatives for pain management. Studies have shown that intravenous (IV) lidocaine can be a safe and effective medication for the treatment of pain and can reduce the use of opioids in the emergency department. The primary objective of this study is to determine the efficacy of IV lidocaine compared to morphine for the treatment of pain in the emergency department.

Methods:
This is a retrospective, observational, cohort study looking at data collected from Cleveland Clinic Emergency Departments (EDs) and Freestanding EDs from March 2018 to January 2019. Patients at least 18 years old who presented to the ED and received IV lidocaine or IV morphine for pain control for one or more of the indications listed in the inclusion criteria will be candidates for the study. Patients that received lidocaine dosed at 1.5 mg/kg (max dose: 100 mg) will be compared with patients who received a fixed dose of morphine (2 mg or 4 mg) and matched based on baseline pain score, demographics, and ICD-10 code. The primary outcome of interest will be the difference in reported pain scores from baseline 1 hour after administration of IV lidocaine compared to morphine. Non-inferiority will be determined if there is less than a 1 point margin of error on the numerical pain score (0-10), using the lower bound of the 2-sided 95% confidence interval.

Results:
Final results and conclusions are pending data analysis and will be presented at the Ohio Pharmacy Resident Conference

Conclusions:
Final results and conclusions are pending data analysis and will be presented at the Ohio Pharmacy Resident Conference

Predicting clindamycin resistance in pediatric Staphylococcus aureus infections

Sarah Firmani, PharmD, Children's Hospital of Michigan, Detroit Medical Center
Leah Molloy, PharmD, Nahed Abdel-Haq, MD

UAN:

Learning Objectives:

1. Describe the trend in Staphylococcus aureus susceptibility to clindamycin over time.
2. Recognize risk factors and infection types that may impact the susceptibility of Staphylococcus aureus isolates to clindamycin.

Purpose:
Clindamycin (CLN) is commonly used for empiric treatment of uncomplicated skin, soft tissue (SSTI) and musculoskeletal infections (MSKI) in children when the suspected pathogen is Staphylococcus aureus (SA), despite decreasing susceptibility, as low as 79% per 2016-2017 institutional antibiograms. Patient and infection characteristics associated with CLN-resistant (R) SA are unknown.

Methods:
In this retrospective case control analysis of children with community-acquired SA infections, an initial sample was evaluated for overall CLN susceptibility. Then, additional CLN-R isolates were selected for comparison to CLN-S isolates.

Results:
The initial sample included 103 infections, 87 (84%) of which were CLN-S. The most common infection type in the initial sample was abscess, and 91% (n = 49/54) were CLN-S. This susceptibility rate was significantly higher than the 2016-2017 institutional antibiogram, p = 0.038. For comparison between CLN-S and CLN-R groups, an additional 73 patients were included in the CLN-R group. This yielded a total of 176 patients, 87 in CLN-S group and 89 in CLN-R, with various infections: 45% (79) abscess, 9% (16) other, 9% (15) eye/ear/nose/throat, 8% (14) wound, 6% (11) surgical site, 6% (10) impetigo, 6% (10) eczema superinfection, 5% (8) osteomyelitis, 2% (4) lymph node, 2% (3) pustular rash, 2% (3) pyoderma, 2% (3) staphylococcal scalded skin. Characteristics and infection types more common in the CLN-S group than CLN-R were daycare attendance (9.2% vs. 1.1%, p = 0.012), recurrent abscesses (8% vs. 1.1%, p = 0.013), wound infection (13.8% vs. 2.2%, p

Conclusions:
The CLN susceptibility of SA isolated from skin abscesses was significantly higher than the antibiogram. CLN may continue to be useful in the empiric treatment of community-acquired SSTI and MSKI.

Intravenuos Iron Drug Use Evaluation

Mary Grace Fitzmaurice, PharmD- PGY-1 Pharmacotherapy Resident, Cleveland Clinic Main Campus
Julie Barnes, RPh, Pharm.D.; Kathleen Faulkenberg, Pharm.D., BCPS; Nicole Palm, Pharm.D., BCPS

UAN:

Learning Objectives:

1. Discuss the major causes of anemia, current treatment options and associated risks
2. Describe the use of intravenous iron products at Cleveland Clinic Main Campus

Purpose:

Purpose: The use of intravenous iron has increased amongst a variety of service lines at the Cleveland Clinic - Main Campus. These products are associated with higher costs and can have infusion related side effects. It has been recognized that patients may be receiving this therapy for undefined indications or for prolonged durations, which may affect safety and efficacy. The purpose of this study was to categorize and describe how intravenous iron therapy is being utilized.

Methods:

Methods: This study was a retrospective medical chart review of adult inpatients who have received any intravenous iron product between October 1, 2017 and December 31, 2017. Data collected includes specific iron product, dose, duration of therapy, ordering service, and documented stop date. Hemoglobin, iron study results and receipt of any blood transfusions was also collected. Documented infusion reactions and active orders for antimicrobial therapy were collected to assess safety of the therapy.

Results:

Results: Our search resulted in 309 orders within our specified study period, correlating to 251 unique patients. The most frequent comorbidities at baseline were anemia, heart failure, chronic kidney disease, and malabsorption, respectively. Ferric gluconate was the most frequently prescribed product, comprising 88.7% of the total orders. The median cumulative dose was 250 mg and median duration of therapy was 2 days. Iron deficiency anemia and blood loss were the most common indications for the use of intravenous iron therapy. One-third of patients received a blood transfusion prior to initiation of therapy, and 19.9% received a transfusion during or after completion of therapy.

Conclusions:

Conclusions: Our drug use evaluation found that our formulary restrictions are being appropriately followed. The median dose of ferric gluconate was 250mg. This may suggest the need for additional opportunities to facilitate continued therapy as an outpatient, or that some patients may be receiving therapy when not needed.

Type 2 Diabetes Prescribing Habits Amongst Providers to an Underserved Population

Atem A. Fontem, PharmD
Cynthia A. King, PharmD, BCACP, CACP; Benjamin S. King, PharmD, BCACP

UAN:

Learning Objectives:

1. Review the background literature related to Type 2 diabetes mellitus (T2DM) prescribing habits in the USA
2. Discuss the prescribing practices of providers in the MetroHealth System

Purpose:
The American Diabetes Association recommends drug selection based on patient specific factors; however, formulary restrictions may leave prescribers inundated. Currently, limited evidence is available regarding the primary factors influencing prescribers drug therapy selection. The purpose of this study was to assess the factors that influence MetroHealth providers when selecting antidiabetic medications.

Methods:
At a large, public, academic health-system, all prescribers were sent an electronic, optional, anonymous survey. Inclusion criteria included prescribers treating T2DM in non-pregnant adult patients. The factors evaluated included: cost, A1c elevation, comorbidities, adherence, weight, tolerability, social/physical/mental limitations, algorithms/guidelines/usual practice.

Results:
A total of 87 prescribers responded (response rate of 31%), which included physicians (56.3%), nurse practitioners (21.8%), resident (18.4%), and fellows (3.4%) with the majority practicing in internal or family medicine (47.1%). The most frequently prescribed T2DM medications included: metformin (83.8%), insulin (78.1%), and sulfonylureas (64.8%). The top factors influencing prescribing of the three most commonly selected medications were cost and A1c elevation (cost: 94.1%, 57.4%, 81.2% respectively; A1c elevation: 81.2%, 69.6%, 89.9% respectively). No differences were seen between professional designation and prescribing patterns. GLP-1RA and SGLT2i were not commonly prescribed which was largely driven by cost concerns (63.8% and 64.7% respectively). When comparing specialists to generalist, factors influencing prescribing differed including more positive benefits identified by specialists for use of SGLT2i (p=0.011) versus sulfonylureas had more positive benefits identified by generalist (p=0.001).

Conclusions:
Although guidelines encourage the use of GLP1-RA and SGLT2i as second-line agents in patients with CVD, HF, or CKD, these medications were not reported among the most commonly prescribed. Providers identified positive benefits for patient comorbidities and weight loss; however, the cost of medication seemed to overwhelm the benefits. Since this health-system serves many underserved and uninsured patients, these results may over emphasize the impact of cost.

Comparison of Etomidate and Ketamine for Procedural Sedation in the Emergency Department for Patients Undergoing Orthopedic Reductions

Michael Friebe, PharmD, Hillcrest Hospital – Cleveland Clinic
Matthew Nagar, PharmD, BCPS, BCCCP; Julia E. Kuroski, PharmD, BCCCP

UAN:

Learning Objectives:

1. Review procedural sedation in the Emergency Department
2. Discuss rationale for conducting review of sedation agents
3. Provide Preliminary Results from Data Analysis

Purpose:
Procedural sedation for orthopedic reductions in the Emergency Department (ED) requires close attention and monitoring from skilled physicians and nursing staff.1-4 Two commonly used agents are etomidate and ketamine. In the literature these agents are generally regarded as being equally safe to use, however, they may not perform equally due to differences in their side effect and kinetic profiles. The adverse effect of myoclonus is common with etomidate use, however it is not commonly associated with ketamine use.5-8 Myoclonus caused by etomidate may not allow patients to achieve a relaxed state for orthopedic reduction procedures. There is little evidence to date comparing these two agents head to head for efficacy. The purpose of this study is to compare the safety and efficacy of etomidate and ketamine for the use of procedural sedation in patients undergoing orthopedic procedures in the ED.

Methods:
A retrospective cohort study will be conducted at Hillcrest Hospital in Mayfield Heights, Ohio. Patients will be included if they are ≥ 18 years old and receive either etomidate or ketamine as initial sedative agent for procedural sedation to perform an orthopedic reduction in the ED between 5/1/13 and 5/1/2018. Patients will be excluded if they are < 18 years old, pregnant, or incarcerated, receive multiple sedatives at initiation of procedural sedation, or have multiple joints or limbs needing set. Adverse effects of sedative agents used as well as vital signs of the patients throughout their procedures will be recorded.

Results:
Study results will be presented upon finalization of the study.

Conclusions:
Study conclusions will be presented upon finalization of the study.

Evaluation of the safety and efficacy of apixaban versus warfarin in patients with end-stage renal disease

Elizabeth Gillespie, PharmD - PGY1 Pharmacy Practice Resident at The Jewish Hospital – Bon Secours Mercy Health
Deanna Urasek, PharmD, BCPS, BCGP

UAN:

Learning Objectives:

1. Review current guidelines for anticoagulation in non-valvular atrial fibrillation and venous thromboembolism patients with end-stage renal disease
2. Discuss apixaban and the manufacturer dosing recommendations

Purpose:
Patients with end-stage renal disease (ESRD) have been excluded from trials leading to the approval of the direct oral anticoagulant (DOAC) class of medications. Apixaban is the least renally eliminated of the DOACs and the only one not contraindicated in patients with a creatinine clearance (CrCl) less than 15 mL/min. There has been increased use of apixaban in this patient population. The purpose of this project is to evaluate the safety and efficacy of apixaban in patients with ESRD on hemodialysis compared to warfarin.

Methods:
This was a retrospective, single-center, cohort study. The patient population for this study was gathered from The Jewish Hospital – Bon Secours Mercy Health database between July 1, 2016 to July 31, 2018. Patients were included if they have ESRD on hemodialysis and are receiving either apixaban or warfarin for the indication of non-valvular atrial fibrillation (NVAF) or venous thromboembolism (VTE). The primary outcome was the occurrence of major bleeding. The secondary outcomes were the occurrence of stroke, recurrent VTE, and minor bleeding. All data was collected based on chart review.

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

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

Direct Oral Anticoagulant vs. Warfarin in Morbidly Obese Patients for Prevention of Recurrent Venous Thromboembolism

Allison Golom, PharmD, PGY1 Pharmacy Resident, Beaumont Hospital-Dearborn
Sin-Ling Jennings, PharmD, David Wilpula, PharmD, BCPS

UAN:

Learning Objectives:

1. Recall the components of Virchow's triad and the risk factors for developing venous thromboembolism
2. Outline the pros and cons to using direct oral anticoagulants over warfarin for a specific patient
3. Explain the current recommendations for the treatment of venous thromboembolism in morbidly obese patients

Purpose:

Anticoagulation is the mainstay of treatment for venous thromboembolism (VTE) and prevention of recurrent VTE. Per the American Heart Association CHEST guidelines, factor Xa inhibitors and thrombin inhibitors are recommended over vitamin K antagonists provided there are no contraindications. Numerous studies, including the Atherosclerosis Risk in Communities and Cardiovascular Heath Study have found a significant increase in risk of VTE in obese patients. Unfortunately, anticoagulation initiation in the morbidly obese population is not straightforward. The International Society on Thrombosis and Haemostasis 2016 guidelines recommend avoiding the use of direct oral anticoagulants (DOACs) in morbidly obese patients due to limited and inconsistent clinical data. This study assesses the use of DOACs in the morbidly obese population and aims to show whether DOACs are effective and safe for use in these patients.

Methods:

A retrospective, single-center, multi-site cohort study was conducted of patients older than 18 years, with BMI > 40 kg/m2 or weight > 120 kg, who were diagnosed with VTE and received warfarin or DOAC (i.e. apixaban or rivaroxaban). Patients were excluded if they had a prosthetic heart valve, were pregnant, or had end-stage renal disease. The primary efficacy outcome was the incidence of recurrent VTE. The primary safety outcome was the incidence of major bleeding.

Results:

A total of 161 patients were included in the preliminary analysis. The incidence of recurrent VTE was 6.12% in the DOAC group compared to 12.70% in the warfarin group (rate ratio = 0.448; 95% CI = 0.148 to 1.360; p = 0.157). The incidence of major bleeding was 3.06% in the DOAC group compared to 3.17% in the warfarin group (rate ratio = 0.963; 95% CI = 0.156 to 5.932; p = 0.968).

Conclusions:

Rivaroxaban and apixaban may be considered as alternatives to warfarin for VTE treatment and prevention of recurrent VTE in morbidly obese patients.

Evaluation of ISMP safety recommendations for patients prescribed Direct Oral Anticoagulants (DOACs) in the outpatient setting

Angela Goodhart, PharmD PGY2 Pharmacy Resident - Ambulatory Care, Summa Health System - Akron Campus
Susanna Petiya, PharmD; Rhianna Godios, PharmD, BCACP, CACP; Roger Chaffee, MD, FACC

UAN:

Learning Objectives:

1. Describe the FDA approved use of DOAC agents
2. Identify Institute for Safe Medication Practice (ISMP) safety recommendations for DOAC prescribing and monitoring

Purpose:

Direct oral anticoagulant (DOAC) usage has increased due to standard indication based dose regimens and less frequent monitoring requirements compared to warfarin. However, current literature supports baseline monitoring and routine follow up for patients on DOAC therapy. In 2017 the Institute for Safe Medication Practices (ISMP) published an updated antithrombotic self-assessment tool for health systems to analyze prescribing and monitoring habits associated with DOACs.

The purpose of this quality improvement project was to describe the current prescribing and monitoring habits of Summa Health practitioners utilizing DOACs for antithrombotic therapy. A secondary objective was to describe safety and efficacy outcomes of DOAC agents at Summa Health.

Methods:

This quality improvement project was a retrospective chart review of patients prescribed DOACS by Summa Health practitioners in the outpatient setting. Patients newly prescribed a DOAC (dabigatran, rivaroxaban, apixaban, or edoxaban) in an outpatient office from June 1, 2017-May 31, 2018 were included. Two hundred patients who met the inclusion criteria were randomly selected for data collection. Patients transitioning from one DOAC to another were excluded. Data collected included appropriateness of the initial DOAC dose based on age, renal function, and indication; documented baseline serum creatinine and complete blood counts; follow up within 3-6 months related to the DOAC; major and minor bleeding events; and thrombosis. Data was evaluated with descriptive statistics.

Results:

Of the 200 patients, 74.3% were started on an appropriate initial DOAC dose based on FDA labeling, and 72.2% had baseline labs prior to DOAC initiation. However, only 55.1% of patients had both baseline labs and an appropriate initial dose. While 80.4% of patients had a follow up appointment with their prescriber within 3-6 months, only 24.5% of follow ups documented addressing adherence, safety, and efficacy as recommended by ISMP. Incidences of bleeding and thrombosis were low.

Conclusions:

Majority of patients started on a DOAC agent at Summa Health have baseline labs and appropriate initial doses. Follow-up documentation specifically addressing DOAC agents is fairly low at Summa Health; this presents an opportunity for improvement. Going forward, instances where initial dose was inappropriate will be examined for any common trends to target improvement. Additionally, prescribers will be encouraged to ensure baseline labs are documented in the medical record.

Evaluation of the Pharmacist Medication Reconciliation Process in the ICU

Cassandra Hacker, Pharm.D. - PGY-1 Pharmacy Resident at Cleveland Clinic Main Campus
Amanda Hansen, Pharm.D., MSHA, FACHE; Mollie Lumpkin, Pharm.D., BCPS, BCCCP; Daniel Lewis, Pharm.D., BCPS; Stephanie Bass, Pharm.D., BCPS, BCCCP

UAN:

Learning Objectives:

1. Review the benefits of completing medication reconciliation in the ICU.
2. Discuss the study results regarding differences in outcomes between patients with medication reconciliation completed while in the ICU vs on the regular nursing floor.

Purpose:
Studies of admission medication reconciliation (AMR) for hospitalized patients suggest that AMR improves continuity of care and reduces medication errors, however data are lacking in regard to outcomes of ICU patients who receive AMR. The purpose of this study is to evaluate the outcomes of pharmacist-driven AMR completed in the ICU.

Methods:
This study is a non-interventional, retrospective medical chart review of adult patients admitted to a Cleveland Clinic Main Campus ICU from December 1, 2017 through June 17, 2018 who were identified as high risk (HR) for readmission, identified as HR within their ICU stay and received AMR during same admission. The primary objective is to describe the patient population and workflow process for AMR in ICU. The secondary objective is to compare the number of interventions made for patients with AMR completed in the ICU versus after transfer out of the ICU.

Results:
500 patients were evaluated, with 48.8% (n=244) having AMR completed in the ICU. Median time from hospital admission to HR identification was 3.5 days [1.2-9] and from HR identification to AMR completion was 3.4 days [1.5-6.4]. More patients were discharged home who received AMR out of ICU (50% vs 37%, p

Conclusions:
Although this may delay time to completion of AMR, this study suggests that AMR may be postponed until patients are transferred out of the ICU and may result in more interventions.

Predictors of 30-day readmission in family medicine patients to identify candidates for transitional care management (TCM) services

Erin Harpster, PharmD - PGY1 Pharmacy Resident Cleveland Clinic Fairview Hospital
Lu Wang, MS; Rachel Stulock, PharmD, BCACP

UAN:

Learning Objectives:

1. Discuss literature regarding readmission risk in family medicine patients
2. Identify and define the 3 risk factors most associated with 30-day readmission in family medicine patients

Purpose:
An estimated 19.6% of Medicare fee-for-service beneficiaries are readmitted within 30 days and 75% of these readmissions are considered preventable. Payment penalties for excessive 30-day readmissions and value-based payment models, create an urgent need to identify and target high-risk patients. Previous studies identified 30-day readmission predictors among family medicine inpatient services such as previous hospitalization, Charlson scores, polypharmacy, and marital status. Furthermore, pharmacist provided TCM interventions have shown to identify high-risk patients and reduce readmission rates. Identification of 30-day readmission predictors will allow the family medicine service to target high-risk patients for more intensive post-discharge TCM services, including pharmacist services.

Methods:
This is a retrospective cohort study using multiple logistic regression analysis to identify factors associated with 30-day readmission. The primary objective of this study is to identify the strongest predictors of 30-day readmission in patients discharged from a family medicine residency inpatient service that are not included in current readmission risk prediction methods. The secondary objective is to determine if providing TCM visits with primary care pharmacist involvement serves as a protective factor for 30-day readmission. This study will include 359 adult non-pregnant patients discharged from an inpatient family medicine service from May 2017 to June 2018. Data will be extracted from the electronic medical records. Patients with insufficient primary data points will be excluded from analysis. Statistical analysis will identify three factors that are most associated with 30-day readmission. These factors will then be utilized by the family medicine service to select patients for transitional care management services.

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

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

Evaluating the effectiveness of oral beta-lactam antibiotics for definitive treatment of Enterobacteriaceae bloodstream infections

Andrea Haugtvedt, PharmD - PGY1 Pharmacy Practice Resident, Beaumont Hospital-Royal Oak
Griffin R Calme, PharmD Candidate; Wasym Mando, PharmD Candidate; Veena Rajanna, MS, PharmD, BCPS, BCPPS; Christine N Yost, PharmD, BCIDP

UAN:

Learning Objectives:

1. Discuss current evidence available to guide oral (PO) antibiotic stepdown therapy for Enterobacteriaceae-associated bloodstream infections (EB-BSIs)
2. Describe patient and treatment characteristics that are associated with treatment failure when patients are treated with PO therapy for an EB-BSI

Purpose:
Fluoroquinolones (FQs) are often the preferred oral (PO) antibiotic stepdown therapy for gram-negative bloodstream infections (BSIs) because of their high bioavailability. The use of oral beta-lactams (BLMs), which have moderate to low bioavailability, remains controversial. The objective of this study was to determine the difference in treatment failure at 90 days between PO BLMs vs FQs for the treatment of Enterobacteriaceae bloodstream infections (EB-BSIs).

Methods:
This study was a multicenter, retrospective chart review of hospitalized patients 18 years and older with an EB-BSI. Patients were treated at Beaumont Troy, Royal Oak or Grosse Pointe hospital between 1/1/2012 and 7/31/2018 and discharged home on either an oral FQ or BLM antibiotic as definitive therapy. Patients were excluded if they were pregnant, had a polymicrobial or complicated BSI, discharged to hospice, had greater than a 24 hour lapse in antibiotic therapy within 7 days of the index culture, or had a non-sequential step down from IV antibiotic to PO BLM or FQ therapy. The primary outcome was 90-day treatment failure, which was a composite of 1) all-cause mortality 2) microbiological recurrence or 3) change in antibiotic therapy prior to completion of planned PO antibiotic course.

Results:
A total of 361 patients were included (BLM: 120, FQ: 241). Patients treated with a BLM were older (mean 76±12 years, vs. 70±13 years, p

Conclusions:
Further results and analysis from this study will be presented at the 2019 Ohio Pharmacy Resident Conference.

Vancomycin Nephrotoxicity: Fact or Fiction? A Matched Cohort to Alternative Agents

Taylor Hendrix, PharmD - Mercy Health St. Vincent Medical Center
Rachel Leis, PharmD, BCPS; Alison Paplaskas, PharmD, BCCCP; Deborah Bakle-Carn, PharmD

UAN:

Learning Objectives:

1. Review available literature regarding the incidence of nephrotoxicity with vancomycin compared to ceftaroline, daptomycin or linezolid
2. Compare outcomes associated with the use of vancomycin to alternative agents in a matched patient population

Purpose:
The Infectious Disease Society of America recommends vancomycin first-line for methicillin resistant gram-positive infections, despite its association with nephrotoxicity. Vancomycin alternative agents like ceftaroline, daptomycin, and linezolid have been perceived as less nephrotoxic based on available trials, however these trials have significant limitations. Thus, it is imperative to investigate if use of vancomycin alternatives decrease the incidence of nephrotoxicity to promote cost savings and narrow therapy principles of antimicrobial stewardship.

Methods:
This retrospective matched cohort chart review analyzed patients between January 1st, 2016 to August 31st, 2018 who received one of four antibiotics with no evidence of acute kidney injury at time of enrollment. Patients were matched 1:1:1:1 based on age, severity of illness, and source of infection. Patients excluded were those who received renal replacement therapy in the 30 days prior, received any of the study agents within 48 hours prior to enrollment, currently incarcerated, or pregnant. The primary outcome was the incidence of acute kidney injury between the four groups using KDIGO criteria at day seven. Secondary outcomes included hospital length of stay and mortality.

Results:
Eighty-eight patients were included in this study, with 22 in each group. The overall median age was 57.5 years, median APACHE II score of 8.5 and median baseline serum creatinine of 0.75 mg/dL. The primary outcome was not statistically different between the four antibiotics (vancomycin 4.5%, ceftaroline 22.7%, daptomycin 13.6% and linezolid 9.1%; p=0.384). There was no difference in hospital length of stay (p=0.242) or mortality (p=0.714).

Conclusions:
There was no significant difference in nephrotoxicity between vancomycin and other gram-positive antibiotics. Vancomycin should continue to be used first line for suspected or confirmed methicillin resistant gram-positive infections unless the patient has a valid indication for alternative therapy.

Assessment of the appropriateness of naloxone administration in suspected overdose patients

Nicholas Herbst, PharmD - PGY-1 Pharmacy Resident Aultman Hospital
Scott Perry, PharmD, BCPS and Rebecca Prewett, PharmD, BCPS

UAN:

Learning Objectives:

1. Identify situations where naloxone administration would be appropriate in suspected overdose patients
2. List the signs and symptoms associated with acute withdrawal

Purpose:
Despite recent opioid epidemic efforts leading to a decrease in opioid related deaths, some patients still receive potentially excessive doses of naloxone. The purpose of this study is to assess the appropriateness of naloxone administration in suspected overdose patients presenting to one institution's emergency department.

Methods:
A retrospective chart review was completed of adult patients presenting to the emergency department with suspicion of overdose from January 1, 2017 to December 31, 2017. Patients were identified through the electronic medical record and were included if they were at least 18 years of age and administered at least one dose of naloxone in the emergency department. Appropriate administration of naloxone was determined with the patient meeting one or more of the following criteria: unconsciousness or difficult to arouse, pinpoint pupils, respiratory rate ≤ 8 breath per minute and oxygen saturation ≤ 90%, or one time administration for diagnostic purposes. Patients were excluded if they were less than 18 years of age, suffered cardiac arrest, or if there was missing naloxone dosing information. The primary outcomes of this study included: amount of naloxone administered, incidence of acute withdrawal, and length of stay.

Results:
Of the 50 patients identified through retrospective chart review, 37 met criteria for study inclusion. Of these 37 patients, 11 were administered naloxone inappropriately. The inappropriate administration group received more naloxone (6.0mg vs 2.0mg, $p = 0.001$) and were more likely to experience acute withdrawal symptoms (27.3% vs 3.8%, $p = 0.039$). However, there was no significant difference in length of stay between those inappropriately vs appropriately administered naloxone (58.525 hrs vs 48.440 hrs, $p = 0.984$).

Conclusions:
Patients inappropriately administered naloxone are more likely to receive larger total amounts of naloxone and are more likely to have symptoms of acute withdrawal based on the results of this study.

Medication Transitions in Hematologic Malignancy Patients at a Safety Net Hospital

Rachel Hoffman, PharmD, PGY-1 Pharmacy Resident The MetroHealth System
Jan Kover, RPh, BCOP, Nilam Patel, PharmD, BCPS

UAN:

Learning Objectives:

1. Explain common root causes, risk factors, and consequences of ineffective care transitions
2. Define essential components for effective medication transitions of care

Purpose:
The primary objective of this study is to assess patient, disease, and medication related factors that impact the rate of unplanned readmissions before next chemotherapy cycle or within 30-days since last chemotherapy admission. Secondary objectives include identifying if changes in medications, treatment plans, and adverse events are communicated upon discharge and to assess coordination of follow-up care.

Methods:
This study is a retrospective chart review conducted at The MetroHealth System. All patients with leukemia, lymphoma, or multiple myeloma aged > 18 years that received chemotherapy during an admission from January 1, 2015 to January 1, 2018 were evaluated. Patient data was extracted from the electronic medical record (EMR) system EPICTM. The data was analyzed using descriptive statistics and chi-square tests.

Results:
A total of 107 inpatient chemotherapy encounters and 47 patients were included. Of those encounters that lead to readmission, 68.7% (n=22/32) did not have medications filled prior to discharge, 78.1% (n=25/32) did not receive a follow-up phone call and 40.6% (n=13/32) did not attend their follow-up appointment. Encounters that ended in discharge to a skilled nursing facility (SNF) resulted in more readmissions (12.5% vs. 2.6%; P=0.0079). In all 107 encounters, adverse events occurred in 40.2% (43), only 44.2% (19) of those were communicated upon discharge. Modifications to the treatment plan were made in 33.6% (36) of encounters, of which, only 33.3% (12) were communicated upon discharge. One factor that may have decreased readmission, were pharmacist notes in the treatment plan, 48% (n=36/75) vs. 53.1% (n=17/32).

Conclusions:
Factors that may have led to readmission include: discharge to SNF, not filling medications prior to discharge, not receiving a follow-up phone call, and not attending follow-up appointments. EMR notes made by pharmacists may decrease rates of readmission. There is a need to improve transitions of care communication in patients with hematologic malignancies.

Impact of total body weight on response to norepinephrine and need for additional vasopressors in critically ill adults with septic shock

Courtney B. Holtzapple, PharmD - PGY2 Critical Care Resident - ProMedica Toledo Hospital/Toledo Children's Hospital
Kevin M. Wohlfarth, PharmD, BCPS, BCCCP, BCCP, Roberta E. Redfern, PhD, Michael A. Rudoni, PharmD, BCPS, BCCCP

UAN:

Learning Objectives:

1. Describe the physiologic changes that occur in patients presenting with septic shock.
2. Discuss available literature assessing obesity and norepinephrine dosing strategies in patients with septic shock

Purpose:
Current literature demonstrates variability in norepinephrine (NE) dosing strategies with both weight-based (mcg/kg/min) and non-weight-based (mcg/min) methods considered acceptable. Unfortunately, differences in total exposure and titration of NE may depend on whether institutions employ weight-based dosing (WBD) versus “flat” rates (non-WBD), or the dosing weight utilized. Previous studies have highlighted the variation in practices; however, there has been a lack of standardization in guidelines and design of clinical trials. A critical evaluation of dosing practices may prompt an investigation which could provide clinicians with better guidance for therapy escalation, as well as more insight to the relationship between body weight and sepsis outcomes. The purpose of this study was to evaluate the impact of total body weight on response to WBD norepinephrine and the need for additional vasopressors in septic shock.

Methods:
A single-center, retrospective, observational cohort was performed at a 794-bed, tertiary, academic medical center evaluating patients who received norepinephrine for septic shock between November 2016 and November 2018. Adult patients were eligible if they were admitted to the medical intensive care unit with septic shock and received norepinephrine for at least 6 hours. Patients were excluded if they received an initial vasopressor other than norepinephrine, had a mean arterial pressure (MAP) goal other than 65 mmHg, or if they were transitioned to comfort care. Data were collected via electronic medical records and included: demographics, height, weight, BMI, baseline SOFA score, source of infection, need for mechanical ventilation, baseline MAP, lactate, time to peak NE dose, dose prior to start of second vasopressor, administration of antibiotics, steroids, and fluid resuscitation, and ICU and hospital length of stay. Primary outcomes included time to addition of second vasopressor and proportion of patients requiring a second vasopressor.

Results:
Data analysis is ongoing.

Conclusions:
To be presented at the 2019 Ohio Pharmacy Residency Conference.

Improving Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores in a community hospital via pharmacist and student pharmacist interventions

Stephen C Howell, PharmD, MBA - St. Elizabeth Healthcare
Andrea Jackson, PharmD, BCPS; Scott Simon, PharmD, MBA

UAN:

Learning Objectives:

1. Discuss the HCAHPS survey including its purpose, contents, and impact on hospital reimbursement
2. Identify strategies to improve HCAHPS scores through pharmacy intervention

Purpose:

Patient satisfaction is one of the most important components of assessing the quality of healthcare facilities. In 2006, the Centers for Medicare and Medicaid Services (CMS) implemented the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey to capture specific elements of patient satisfaction. The publicly reported survey data is meant to create incentives for quality improvement and enhance accountability. In 2010, the Affordable Care Act allowed CMS to include HCAHPS scores among the measures to be used to calculate value-based incentive payments which help determine reimbursement rates for hospitals. This study will assess the impact that pharmacists and pharmacy students can have on HCAHPS scores through the discharge medication delivery (DMD) service with counseling. Additionally, this study will evaluate changes in 30-day readmission rates before and after implementation.

Methods:

Patients were eligible for the DMD program at discharge if they were not being admitted to a rehabilitation or long-term care facility. When enrolled, patient's new medications were delivered to bedside prior to discharge. Patients were counseled on indication, duration, and common side effects of any new medications for three months from January 2019 through March 2019 throughout St. Elizabeth Edgewood. HCAHPS scores from January 2017 through March 2017 prior to the DMD service were utilized to compare the impact of the service with counseling. In addition, readmission rates within 30 days of discharge have been obtained from retrospective chart review during the same timeframe and have been compared to rates following implementation of the DMD service with counseling.

Results:

Data collection and analysis are currently being conducted; results and conclusions will be

presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Data collection and analysis are currently being conducted; results and conclusions will be

presented at the Ohio Pharmacy Resident Conference.

Evaluation of safety and utilization of direct oral anticoagulants in a community medical center

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Sarah Suffel, PharmD, BCPS, CACP, Lori Ernsthausen, PharmD, BCPS

UAN:

Learning Objectives:

1. Review previously published data regarding incidence of major and minor bleeding associated with direct oral anticoagulant use
2. Discuss frequency of inappropriate dosing of direct oral anticoagulants

Purpose:
Direct oral anticoagulants (DOACs) are proven to be non-inferior to warfarin in prevention of venous thromboembolism (VTE) and are shown to have a lower risk of bleeding events. Insufficient data exists comparing rates of adverse events of each agent against one another. This study aims to compare risk of major and minor bleeding between rivaroxaban, apixaban, and dabigatran and rates of utilization in a community hospital setting.

Methods:
Retrospective chart reviews were conducted to identify patients ordered rivaroxaban, apixaban, or dabigatran during their hospital admission at Mercy Health – Lorain Hospital from November 2016 through August 2018. Data collected included gender; age; past medical history of diabetes, chronic kidney disease, chronic heart failure, prior stroke or gastrointestinal (GI) bleed; incidence of major, minor, and GI bleeding as defined by International Society for Thrombosis and Hemostasis (ISTH criteria); renal function; and dose of DOAC agent. Data points were assessed through review of patient problem lists, lab values, and physician and nursing notes available in the electronic medical record.

Results:
A total of 444 subjects were reviewed; 216 in the apixaban group, 174 in the rivaroxaban group, and 54 in the dabigatran group. Major bleeding occurred in 12/216 (5.6%) of the apixaban group, 3/174 (1.7%) of the rivaroxaban group, and 3/54 (5.6%) of the dabigatran group. Minor bleeding occurred in 16/216 (7.4%) of the apixaban group, 25/174 (14.4%) of the rivaroxaban group, and 4/54 (7.4%). Average length of stay was 7.2 days in the apixaban group versus 5.1 days in the rivaroxaban group and 4.8 days in the dabigatran group. Readmission within 7 days of hospital discharge occurred in 8.3% of apixaban patients, 7.4% of rivaroxaban patients, and 7.4% of dabigatran patients. Inappropriate anticoagulant dosing based on indication, renal function, age, and weight occurred in 15.2% of the apixaban group, 9.8% of the rivaroxaban group, and 11.1% of the dabigatran group.

Conclusions:
Patients taking rivaroxaban had the lowest incidence of major bleeding, but the highest incidence of minor bleeding compared to apixaban and dabigatran. Dabigatran was associated with a shorter length of stay compared to apixaban and rivaroxaban, but all groups had comparable rates of 7-day readmission. The least amount of inappropriate medication dosing occurred in the rivaroxaban group. No statistical difference in major and minor bleeding occurred. This study did not meet power, yet it highlights the challenges in appropriate DOAC dosing and suggests rivaroxaban may have less risk of dosing errors compared to other DOAC agents.

Implementation of a piperacillin-tazobactam (PTZ) time out in an acute care community hospital

Kelly Huston, PharmD, RPh - PGY1 Pharmacy Resident at Lima Memorial Health System
Brittany Bates, Jason Schumacher, Karen Kier

UAN:

Learning Objectives:

1. Assess the impact of a required indication and time out on PTZ utilization at an acute care community hospital
2. Identify barriers regarding implementation of a required indication and time out

Purpose:
Appropriate antibiotic selection and duration are essential for patients to achieve optimal therapeutic outcomes while reducing antibiotic resistance. Provider-selected indications and antibiotic time outs to re-evaluate the need and clinical appropriateness of the antibiotics are two suggested antimicrobial stewardship interventions. However, there is a lack of published evidence-based literature demonstrating the effectiveness of these interventions. Our hospital identified that our piperacillin-tazobactam (PTZ) utilization exceeds the days of therapy (DOT) benchmarking data available. The objective of this study is to assess the impact of a required indication and PTZ time out at an acute care community hospital.

Methods:
This is a single center, pre/post intervention study at a 329-bed acute care community hospital. The electronic health record software was altered to accommodate this intervention prior to implementation in January 2019. The providers are required to choose a specific indication when entering the PTZ order. Providers have the capability to select “other” and free text an indication. After seventy-two hours, a renewal notice is generated and sent to the provider to prompt re-assessment of the antibiotic regimen. This renewal notice serves as a soft stop. Once renewed, the PTZ order remains active until the hard stop at seven days. The primary outcome is PTZ DOT per 1,000 patient days compared to a historical control. The secondary outcomes include clinical appropriateness, de-escalation rates, utilization of renewal notice, and physician satisfaction with intervention.

Results:
Data analysis in progress. Results will be presented at the 2019 Ohio Pharmacy Residency Conference.

Conclusions:
Will be presented at the 2019 Ohio Pharmacy Residency Conference.

Time between diagnosis and achieving virologic suppression in people living with HIV

Danica Joy Ilagan, PharmD - University of Toledo Medical Center
Kelli Cole, PharmD, BCPS, BCIPD; Lindsey Eitniear, PharmD, BCPS, AAHIVP, CDCA; Joan Duggan, MD; Eric Sahloff, PharmD, AAHIVP

UAN:

Learning Objectives:

1. State the rationale for a shorter time frame between diagnosis of HIV, linkage to care, and initiation of antiretroviral therapy
2. Discuss the current primary literature on initiating rapid antiretroviral therapy in patients diagnosed with HIV

Purpose:
It has been proposed that people living with HIV/AIDS (PLWHA) should initiate antiretroviral therapy (ART) soon after diagnosis to increase retention in care, decrease time to virologic suppression, and decrease risk of transmission; also known as "rapid" ART. This study aimed to assess the time from HIV diagnosis to linkage to care, initiation of ART, and virologic suppression (TVS) in newly diagnosed, ART-naïve subjects at a Midwestern academic institution.

Methods:
IRB-approved, single-center, retrospective cohort including all newly diagnosed, antiretroviral-naïve adult patients seen in the Ryan White Clinic (RWC) for their initial visit between January 1, 2015-December 31, 2015 (control) and January 1, 2017-December 31, 2017 (rapid ART). Patients were excluded if they were previously receiving HIV care or were ART experienced, pregnant, or had an active opportunistic infection. The primary outcome of time from HIV diagnosis to virologic suppression was compared between groups. Additional secondary outcomes include time from diagnosis to initial clinic appointment and time to initiation of ART.

Results:
72 patients were screened and 60 were included; 24 in the 2015 group and 36 in the 2017 group.Median (IQR) time from diagnosis to viral suppression was 137 days (77-318) in 2015 versus 78 (52-152) days in 2017, 88% were male, and 48% white. Secondary outcomes include time of diagnosis to first clinic visit (13.5 days vs. 15.5 days, p=0.791), time of first clinic visit to initiation of ART (15 vs. 0 days, p

Conclusions:
Attempts to shorten time between HIV diagnosis and virologic suppression were successful in this Midwestern cohort. Additional interventions are required to reduce time between HIV diagnosis and the initial clinic visit.

Characterizing medical residents' opioid prescribing patterns before and after implementation of new opioid laws

Reem Ismail, PharmD, Beaumont Hospital - Royal Oak
Sarah Muench, PharmD, CDE, Sara Dadayan, PharmD, CDE, Colleen Lauster, PharmD, BCPS, CDEBianca Aprilliano

UAN:

Learning Objectives:

1. To describe opioid prescribing trends and the Centers for Disease Control (CDC) recommendations to decrease opioid prescribing
2. To explain methods implemented at Beaumont Hospital's Outpatient Clinic to ensure proper prescribing

Purpose:
The United States opioid epidemic has prompted efforts to reduce inappropriate prescribing and use. In 2018, Michigan opioid laws were updated with stricter requirements and limitations. Patients must now be educated on risks of opioid abuse, and providers must be registered with Michigan Automated Prescription System (MAPS) and review reports prior to prescribing controlled substances. In addition, prescribers shall not prescribe more than a 7-day supply of an opioid for an acute pain. The purpose of this study was to assess medical residents' prescribing patterns of opioids and non-opioid pain therapies before and after the law implementation.

Methods:
This was an Institutional Review Board (IRB) approved, single-center retrospective chart review before and after the law implementation. Adult patients with a pain-related complaint addressed during a clinic visit with a medical resident at Beaumont Hospital - Royal Oak were included. Patients were identified based on a review of clinic schedules and electronic medical record. Clinic prescribing patterns were characterized for a 10-day period before and after the law implementation.

Results:
There were 153 (46.7%) clinic visits included before the implementation of the laws with 241 prescriptions written compared to 124 (23.7%) visits included after implementation with 239 prescriptions. The percentage of opioid prescriptions decreased after law implementation [45 (18.7%) vs 34 (14.2%); p=0.2186]. Non-opioid prescriptions increased after law implementation [156 (64.7%) vs 163 (68.2%); p=0.4403]. Non-pharmacologic prescriptions had no difference between both groups [40 (16.6%) vs 42 (17.2%); p=0.8091]. When evaluating opioid prescriptions before and after law implementation: 12 (26.7%) vs 5 (14.7%) new prescriptions, 27 (60%) vs 24 (70.6%) refills, 5 (11.1%) vs 5 (14.7%) de-escalations, and 1 (2.2%) vs 0 escalations.

Conclusions:
There was a favorable but not statistically significant decrease in opioid prescriptions after the law implementation and an increase in non-opioid prescriptions. There was no difference seen in non-pharmacologic management.

Antibiotic prophylaxis with vancomycin in cardiac surgery

Rachel C. Ives, PharmD, Detroit Medical Center
Maknuna Ferdous, PharmD Candidate 2019, Jing Zhao, PharmD

UAN:

Learning Objectives:

1. Describe the current recommendations for antimicrobial prophylaxis in cardiothoracic surgery
2. Identify risk factors for acute kidney injury in cardiothoracic surgery and discuss the risks and benefits of using vancomycin for antimicrobial prophylaxis

Purpose:
An increase in methicillin-resistant Staphylococcus aureus rates at the Detroit Medical Center has prompted routine addition of vancomycin prophylaxis for cardiothoracic surgeries. In addition to the inherent risk of acute kidney injury (AKI) in cardiac surgery, vancomycin is nephrotoxic and can increase the risk of AKI, which is associated with increased in-hospital mortality and reduced-long term survival. The aim of this study was to determine the risk of AKI associated with vancomycin prophylaxis in cardiothoracic surgery.

Methods:
This was a retrospective cohort study conducted at two Detroit Medical Center hospitals, and included patients who received antibiotic prophylaxis for cardiothoracic surgery between January 2008 and August 2017. Patients were excluded if they met any of the following criteria: less than 18 years of age, received antibiotics for another indication within 7 days of surgery, baseline creatinine clearance

Results:
A total of 2,034 patients were screened for inclusion. 967 patients were excluded with the following breakdown: 163 patients had active endocarditis, 69 patients had pre-operative creatinine clearance 48 hours, 285 patients received antibiotics for another indication within 7 days of surgery, 22 patients had incomplete data, and 4 patients did not receive perioperative antibiotics. Data was collected on 1,002 patients who were included in the final analysis.

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

Assessment of vancomycin dosing in critically ill patients on continuous renal replacement therapy (CRRT)

Lejla Jakupovic, PharmD - Pharmacy Resident, Detroit Medical Center
Elizabeth Wilpula, PharmD, BCPS, Zinah Almadrahi, PharmD, Karim Mouabbi, PharmD, Shivam Patel, PharmD Candidate 2019, Krista Wahby, PharmD, BCPS

UAN:

Learning Objectives:

1. Describe advantages of scheduled vancomycin dosing in continuous renal replacement therapy (CRRT).
2. Recognize the factors that must be considered when dosing vancomycin in critically ill patients.

Purpose:
The optimal method of dosing vancomycin in critically ill patients on continuous renal replacement therapy (CRRT) has not been adequately studied. Given the complex pharmacokinetic and pharmacodynamic changes that occur in critically ill patients, numerous studies have found that vancomycin concentrations are often subtherapeutic in patients on CRRT, requiring dosing based on serum level monitoring. Vancomycin dosing based on serum levels requires frequent monitoring and daily follow-up to ensure therapeutic concentrations, which can be time-consuming and costly. If scheduled-dosing of vancomycin produces therapeutic serum level concentrations in critically-ill patients on CRRT, this could reduce the need for time and cost-intensive frequent serum level monitoring required when dosing-by-levels.

Methods:
This was a multi-site retrospective study at an academic medical center assessing the difference between scheduled vancomycin dosing and dosing based on serum-level monitoring in achieving vancomycin levels within target range (10 – 20 mcg/mL) in patients on CRRT. Adult patients with acute or chronic kidney diseases initiated on CRRT in the intensive care unit (ICU) with a vancomycin dosing consult in place at the Detroit Medical Center from January 1st 2015 to December 31st 2018 were included.

Results:
Research is currently in progress. Study results will be presented at the conference.

Conclusions:
We hypothesize that scheduled vancomycin dosing will be non-inferior to dosing based on serum level monitoring in achieving vancomycin levels in target range (10 – 20 mcg/ml) in patients on CRRT.

Evaluation of Apixaban Utilization in Patients with End Stage Renal Disease Requiring Hemodialysis versus Non-Hemodialysis Patients with Atrial Fibrillation

Leanna R. Jaward, PharmD
Rebecca Baker, PharmD, BCPS, BCCCP; Sandra Hartnagle, PharmD, BCPS; Tania Paydawy, PharmD; Jennifer Pilotto, PharmD, BCPS

UAN:

Learning Objectives:

1. Explain the advantages and disadvantages of apixaban compared to warfarin for atrial fibrillation
2. Identify patient populations that meet criteria for dose reduction according to FDA recommended dosing of apixaban for atrial fibrillation

Purpose:
Apixaban is an anticoagulant that is commonly used in the management of atrial fibrillation. Current Food and Drug Administration (FDA) dosing recommendations for apixaban in patients with end stage renal disease (ESRD) requiring hemodialysis (HD) are based off of small, non-controlled pharmacokinetic and pharmacodynamic studies and state that there is no dose adjustment necessary in this population. Due to lack of clear guidance on management of this patient population, the purpose of this study is to evaluate patient characteristics, the occurrence of undesirable patient outcomes and pharmacist interventions in patients with ESRD requiring HD compared to the non-HD patient population.

Methods:
This is a multi-center, retrospective study performed at a three-hospital health system. Adult patients were identified through the electronic medical record and were included if they had an ICD-10 diagnosis of atrial fibrillation, an order for apixaban prior to admission (PTA) and were admitted between August 1, 2016 through July 31, 2018. Patients with ESRD must have received at least one HD session between the aforementioned timeframe to be included. Patients were excluded if they were not on an established HD regimen PTA, had a documented history of valvular heart disease or cardiac valve replacement, had a non-ESRD indication for HD, were prescribed apixaban for dual indications, or were receiving continuous renal replacement therapy or peritoneal dialysis.

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

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

Evaluation of a Pharmacist Intervention to Improve Patient Adherence to Direct Oral Anticoagulants (DOACs) in a Primary Care Population

Heather Johnson, PharmD, The Ohio State University College of Pharmacy and the General Internal Medicine Clinics
Virginia D. Mitchell, Kelli D. Barnes, E. Michael Murphy, Neeraj H. Tayal, MD, Stuart J. Beatty

UAN:

Learning Objectives:

1. Recognize the importance of adherence to DOACs
2. Identify methods to assess and improve adherence

Purpose:
The CHEST and ACC guidelines recommend Direct Oral Anticoagulants (DOAC) as first line therapy over Vitamin K Antagonists (VKA) to prevent clots in patients with atrial fibrillation and venous thromboembolism. Unlike VKAs, frequent laboratory monitoring is not recommended for DOAC therapy to ensure optimal anticoagulation. However, DOACs have short half-lives, thus one missed dose of a DOAC may increase risk for clot making medication adherence critical for therapeutic benefit. The goal of this study is to assess and improve patient adherence to DOACs to ensure long term efficacy and safety of anticoagulant therapy.

Methods:
This retrospective study consisted of a chart review of all patients taking edoxaban, rivaroxaban, apixaban, and dabigatran at 7 general internal medicine clinics at an academic medical center between January 1st, 2018-June 30th, 2018. Utilizing a complete dispense report available in the electronic health record, a medication possession ratio (MPR) was calculated for each patient during this time frame. The dispensing pharmacy was contacted if a complete dispense report was unavailable or appeared to be incomplete. Patients with an MPR less than 90% were contacted via telephone to assess barriers to adherence. Patients were counseled on their specific identified barriers; the primary care physician was notified of poor adherence. Finally, a multidisciplinary plan with shared decision making was developed and implemented for each patient to improve DOAC adherence. The data points collected include the number of patients with an MPR

Results:
Results in progress.

Conclusions:
The results of this study will help determine the need for monitoring of DOAC adherence as well as the role of the pharmacist and primary care team in this area.

Rheumatology Clinic Performance on Rheumatoid Arthritis-Specific Merit-Based Incentive Payment Systems (MIPS) Measures and Drug Monitoring Measures

Megan Johnson, PharmD- University of Toledo Medical Center, Toledo OH
Sarah Lorenzen, PharmD; Laura Manzey, PharmD,BCPP;Holly Smith RPh,MBA;Nezam Altorok MD; Sejal Shah PharmD/MBA Candidate;Deborah Deeter PharmD Candidate; Benjamin Whitney PharmD Candidate

UAN:

Learning Objectives:

1. Review the basic step therapy recommendations from the 2015 American College of Rheumatology Rheumatoid Arthritis Guidelines and safety monitoring for specialty rheumatoid arthritis medications
2. Discuss the Merit-Based Incentive Payment System (MIPS) measures and how to evaluate performance of these measures in a clinic setting

Purpose:
The purpose of this study was to evaluate performance on five rheumatology-specific MIPS measures at a rheumatology clinic within an academic medical center. This study assessed whether providers at the academic medical center were meeting MIPS criteria to ensure quality patient care and enhance reimbursement. Additionally, this study assessed whether patients diagnosed with RA and placed on a traditional DMARD or biologic have undergone the appropriate lab monitoring prior to or while on therapy.

Methods:
This research was been approved by the academic medical center's Internal Review Board for human subjects research. This study is a retrospective chart review that reviewed patient records documented in the academic medical center's outpatient EMR. Patient's with a diagnosis of rheumatoid arthritis and seen in the rheumatology clinic between the dates of 8/1/17 and 8/1/18 were used for this study. Patient information was reviewed for one year prior to the index clinic visit date. Included patients were 18 years of age or older, had a diagnosis of RA using appropriate ICD 10 codes, had at least one year history with the clinic, and had a clinic visit between 8/1/17 and 8/1/18. Rheumatology visit notes, laboratory monitoring data, and medication history were collected from the EMR.

Results:
One hundred patients were included in the final analysis. 81% of patients that were started on a traditional DMARD or biologic had received all of the appropriate guideline/package insert recommended safety monitoring. 6 % of patients had an assessment and classification of disease prognosis documented in the EMR. Additionally, a Disease Activity Scale was only documented in the EMR for 53% patients with a functional status assessment completed for 51% of patients. Lastly, 70% of patients using steroids have been using them for greater than 6 months.

Conclusions:
There are opportunities for increasing the number of patients that are receiving all recommended safety monitoring and quality metric disease activity monitoring based off of the rheumatology MIPS criteria.

Optimization of a Pharmacy-Driven Intravenous to Oral Conversion Protocol Utilizing Student Pharmacists

Nevin Johnson, PharmD - Pharmacy Resident at St. Elizabeth Healthcare
Raymond Meddock, PharmD, BCPS; Sarah Gillian, PharmD, BCPS

UAN:

Learning Objectives:

1. Review the patient and institutional benefits associated with conversion of intravenous (IV) medications to oral (PO) equivalents.
2. Report the potential cost savings associated with optimal timing and selection of IV to PO conversion in eligible patients.

Purpose:
IV to PO conversion protocols have been shown to reduce medication costs, increase patient comfort and safety, and decrease length of stay. St. Elizabeth Healthcare has added several medications to the pharmacy managed IV to PO protocol in the last year. When clinical workflows were assessed, IV to PO conversion takes a lower priority in patient care, despite the potential benefits. The purpose of this study is to increase the number of IV to PO conversions and increase cost savings.

Methods:
This study is a pre-post intervention study of the IV to PO conversion program at St. Elizabeth Healthcare. Interventions include pharmacist education of the importance of IV to PO conversion, protocolized student involvement, and development of easily accessible resources to assist with identifying and initiating patient interventions. A pre-intervention group from January 2019 and a post-intervention group from May 2019 will be randomly selected following pharmacist education and student standardization. Data collected will evaluate eligibility for IV to PO switch, timing of conversion, and cost savings associated with intervention.

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

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

Patient utilization of self-monitoring devices in a community pharmacy

Sarah Jones, PharmD, The Ohio State University College of Pharmacy and Charitable Pharmacy of Central Ohio
Kristin Casper, PharmD, BCACP and Jennifer Seifert, MS, RPh, BCGP

UAN:

Learning Objectives:

1. Describe the role of self-monitoring in management of chronic disease states
2. Define the patient impact of a self-monitoring device program implemented at a charitable pharmacy

Purpose:

Self-monitoring of chronic disease states can be an important tool in achieving clinical goals. In this study, we evaluated data from patient surveys regarding a self-monitoring device distribution program to determine the impact this intervention has on patient perceptions of their health and medications and their self-reported behaviors.

Methods:

This study is being conducted at the Charitable Pharmacy of Central Ohio, which provides prescription medications to underserved patients in Franklin County. Patients who lack appropriate self-monitoring devices are being offered a blood pressure monitor, glucometer, body weight scale, and/or pedometer based on the patients' self-reported diagnoses (prediabetes, diabetes, hypertension, heart failure, or coronary artery disease). The pharmacist or pharmacy student counsels the patient on appropriate use of the device and helps the patient establish appropriate goals. Patients track their self-monitored measurements and follow up with a pharmacist or pharmacy student at each subsequent visit. For this research, patients completed follow-up surveys evaluating their use of the devices, their perceptions about the program, and their engagement in healthy lifestyle changes.

Results:

Between September 2018 and February 2019, 486 self-monitoring devices were distributed. Ninety-eight patients, who reported receiving a total of 151 devices, competed surveys. Over 80% of the devices received by survey participants were reported as being used at least once weekly, and over 80% of patients agreed or strongly agreed that they feel they have more control of their health and they feel more confidence in their medications since receiving their self-monitoring device(s). Additionally, 61% of patients report eating healthier, 37% of patients report getting more physical activity, and 68% of patients report taking their medication as prescribed as a result of the program.

Conclusions:

Patients' self-reported lifestyle changes and feelings about their health and medications following receipt of self-monitoring devices were positive.

Evaluating the impact of pharmacist-led interventions on smoking cessation in an established outpatient medication management clinic

Jesseca Keller, PharmD - Aultman Alliance Community Hospital
Christopher Shelby, PharmD, BCPS

UAN:

Learning Objectives:

1. List and describe the 5 A's of smoking cessation
2. Discuss strategies pharmacists can use to assist patients with smoking cessation

Purpose:
Cigarette smoking is the leading cause of preventable disease and death in the United States. The "5 A's for smoking cessation" has been studied and proven to help guide tobacco users towards smoking cessation. Pharmacists are accessible providers who can help with education, resources, nicotine replacement therapies and other medications to help current smokers reach their goal to quit smoking. The purpose of this study is to examine the impact of pharmacist-led interventions regarding smoking cessation within an established outpatient medication management clinic.

Methods:
Beginning November 1, 2018 patients enrolled in the MEDS Clinic at Aultman Alliance Community Hospital will be screened about their current smoking status. Patients who identify as ready to quit smoking or wanting to decrease cigarettes used per day will undergo an initial visit with a pharmacist who will conduct the "5 A's" of smoking cessation. Interventions will be conducted with the patient's scheduled appointments at the MEDS Clinic. The initial intervention focuses on tobacco use history and answering the Healthy Days Measure questionnaire that focuses on overall assessment of personal health. Together, the patient and pharmacist will create a quit plan that best fits the patients' needs regarding smoking cessation. Follow-up visits will be conducted via telephone or at patient appointments. The Healthy Days Measure will be reassessed at 3 months, for patients wanting to decrease, and 1, 2 and 3 months post-quit date for those who quit completely. The primary endpoint will be change in number of cigarettes smoked per day for those enrolled in the program. Secondary outcomes will include smoking abstinence and evaluation of the Healthy Days Measure questionnaire from baseline. The primary endpoint will be addressed at 30, 60 and 90 days.

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

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

Comparing Traditional Infusion Versus Extended Infusion Piperacillin/Tazobactam in Pediatric Patients with Cystic Fibrosis

Brett A Keskes*, PharmD, ProMedica Toledo Hospital / Toledo Children's Hospital
Tara H. Lines, PharmD, BCIDP and Hannah M. Goldstein, PharmD, BCPS

UAN:

Learning Objectives:

1. Describe the benefits of extended infusion piperacillin/tazobactam in terms of pharmacodynamic parameters
2. Discuss the evidence supporting the use of extended infusion piperacillin/tazobactam

Purpose:
Extended infusion piperacillin/tazobactam optimizes time-dependent pharmacodynamic properties and extensive literature in adults reveal improved outcomes. Cystic fibrosis patients, a population that often carries multidrug-resistant pathogens with higher minimum inhibitory concentrations, have been shown to benefit from extended infusion of certain beta-lactams, but limited evidence exists with piperacillin/tazobactam. The purpose of this study was to compare traditional 30 minute infusion to extended infusion of piperacillin/tazobactam for the treatment of cystic fibrosis pulmonary exacerbations in a pediatric patient population.

Methods:
A descriptive epidemiology study was conducted comparing doses of piperacillin/tazobactam before and after implementation of an extended infusion dosing policy at a 151-bed pediatric hospital. Patients who received multiple dosing regimens were excluded. The primary objective measure was median total daily dose of piperacillin/tazobactam used in each group. Secondary objectives included change in pulmonary function tests from admission to discharge, length of stay, and readmission for cystic fibrosis exacerbation within 30 days of discharge.

Results:
Eighteen separate patient encounters were included (14 in the traditional group and 4 in the extended infusion group). Fifty-percent of patients in each group were culture positive for Pseudomonas aeruginosa. Patients weighing >30kg had a median (IQR) daily dose of 13.5 (13.5-18.0) g in the traditional group compared to 10.125 (10.125-10.125) g in the extended infusion group. Treatment duration was 12.0 (10-15.75) and 14.5 (13.75-16.0) days, and median (IQR) change in forced expiratory volume-one second (FEV1) was 10.0 (7.0-15.25) and 12.5 (6.0-19.5) percent between the traditional and extended infusion group respectively. One patient in the traditional infusion group was readmitted within 30 days of discharge.

Conclusions:
An extended infusion dosing strategy lead to a clinically significant decrease in the median daily dose of piperacillin/tazobactam compared to traditional 30 minute dosing. Further studies are necessary to analyze the long-term outcomes with this dosing strategy in a larger patient population.

The Impact of Marketing on the Utilization of Pharmacy to Dose Vancomycin and Patient Clinical Outcomes

Sabah Khatoon, PharmD-Pharmacy Resident Omnicare
Aaron J Lengel, PharmD, BCACP; Jeremy Sakel, PharmD;Adam McCabe, PharmD; Kelli Jones, PharmD; Katie Sakel, MS

UAN:

Learning Objectives:

1. Outline proper dosing and monitoring protocols for Vancomycin
2. Compare patient clinical outcomes between prescriber dosing and pharmacist dosing

Purpose:

Appropriate vancomycin dosing and monitoring is important in achieving positive clinical outcomes and preventing therapy failure. This is especially true in the long-term care setting where antibiotics are frequently prescribed and there is a high rate of morbidity and mortality associated with infection. A potential solution, pharmacy-led vancomycin dosing, may be beneficial as part of standard of care at long-term care facilities where vancomycin is often prescribed. Utilization of the pharmacy to dose service at Omnicare Pharmacy is currently less than 50%. The purpose of this study is to evaluate the impact of marketing on the utilization of pharmacy to dose vancomycin services and to assess patient clinical outcomes based on pharmacy versus prescriber dosing in long-term care.

Methods:

To conduct this research pharmacy to dose service marketing material was sent out to all prescribers and nursing staff at long-term care facilities in Ohio serviced by Omnicare pharmacy. A retrospective review of patients receiving vancomycin therapy was conducted from September- December 2018 followed by a 3 week pharmacy to dose marketing initiative. Following the marketing phase, a retrospective review of patients receiving vancomycin therapy will be conducted from (what dates). Data collected and evaluated for retrospective review includes: number of vancomycin orders indicating pharmacy dosing versus prescriber dosing; patient demographics including age, sex, and race; clinical data including weight, height, diagnoses, BUN, serum creatinine, trough levels, length of therapy completed, and adverse events. Statistics will be analyzed using ANOVA and regression analysis.

Results:

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

Conclusions:

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

Safety and efficacy of ertapenem vs. alternative prophylaxis for colorectal surgery

Zeana Khodor, PharmD- PGY-1 Pharmacy Resident Beaumont Hospital-Dearborn
Dmitriy Martirosov, PharmD, Lama Hsaiky, PharmD, BCPS

UAN:

Learning Objectives:

1. Recognize risk factors that are associated with surgical site infections.
2. Review appropriate antimicrobial prophylaxis for colorectal surgery based on current guidelines.

Purpose:
Ertapenem (ETP) prophylaxis for colorectal surgery was changed to cefazolin plus metronidazole or gentamicin plus metronidazole (ALT) on January 2017 due to narrower spectrum of activity, improved cost effectiveness and favorable side effect profile. There are conflicting data comparing the efficacy and safety of ETP vs. ALT. The purpose of this study is to determine whether ALT is non-inferior to ETP for prevention of surgical site infection (SSIs) after colorectal surgery at Beaumont Hospital, Dearborn.

Methods:
This quasi-experimental study reviewed patients undergoing colorectal surgery who received ETP from January to December 2016 and ALT from January to December 2017. Patients were excluded if they had emergency or revision of surgery, other antibiotic use, or bacterial infection. The primary outcome of this study was occurrence of SSI within 30 days post-surgery. Secondary outcomes included prolonged neuromuscular blockade and Clostridioides difficile infection (CDI), ototoxicity and acute kidney injury (AKI) within 30 days post-surgery.

Results:
Of the 187 patients who were included, 81 (43.3%) received ETP and 106 (49.4%) received ALT. ALT was found to be non-inferior to ETP for prevention of SSI (2.5%; 95% CI:-1.8%–6.8%). CDI was observed in 1 ETP patient and no ALT patients. There were 3 (3.7%) patients who developed AKI in the ETP group and 6 (5.6%) in the ALT group. There were no reported cases of ototoxicity. There was no significant difference in time to extubation in patients who received gentamicin vs. other antibiotics (16 min vs. 20 min, P = 0.16).

Conclusions:
ALT was non-inferior to ETP for prevention of SSI for colorectal surgery prophylaxis. Therefore, ALT is an effective alternative to ETP for colorectal surgery prophylaxis. Further studies may be necessary to establish a relationship between aminoglycosides and neuromuscular blockade.

Evaluating Older Adult Perceptions of Community Pharmacists and Provided Services as an Aid to Emergency Department Transitions of Care

Danielle Kieck, PharmD PGY1 Community-Based Pharmacy Resident at The Ohio State University and Uptown Pharmacy
Lauren Southerland, MD; Cara Hoyt PharmD; Brianne Porter PharmD, MS

UAN:

Learning Objectives:

1. Describe evolving roles of community pharmacist
2. Identify a need for emergency department transition of care services
3. Discuss areas where community pharmacists can aid in emergency department transitions of care for adults ≥ 65 years old

Purpose:

The role of the community pharmacist continues to evolve with increasing pharmacist involvement in medication therapy management (MTM), immunizations, transitions of care (TOC), and much more. The services offered by pharmacists can be especially important after an emergency department (ED) visit, as 16% of ED prescriptions for older adults have been found to be potentially inappropriate medications and ED revisit rates are as high as one in five patients within 30 days. This study aims to evaluate how older adult patients perceive the role of their community pharmacist during TOC from the ED, and to describe community pharmacist-provided services utilized by patients in the transition from the ED to home.

Methods:

This is a prospective qualitative research study. Eligible patients include those ≥ 65 years old who are being discharged from an urban, academic medical center ED with at least one new medication prescription. Prospective participants will be approached in the ED and then recruited by a research member over the phone 2-3 days post-discharge. Once recruited, participants will be sent a pre-survey focused on gathering background information to describe the patient population and general pharmacy use. Next, participants will participate in focus groups where qualitative data will be gathered centered around the transitions of care experience and the role played by the community pharmacist. Focus group sessions will be limited to no more than 15 study participants per session and will last approximately 1 hour. Focus group sessions will be held until a saturation of major themes is reached. During the focus group sessions, an experienced facilitator will use semi-structured and probing questions to guide discussion throughout the session. The focus groups will be recorded and transcribed and the transcripts will be coded to identify major themes. Data will be analyzed descriptively.

Results:

Research in progress

Conclusions:

Research in progress

Description of Initial Palliative Care Pharmacy Interventions on Patients with Heart Failure at High Risk for Readmission During Transitions of Care at Summa Health System - Akron Campus

Christopher Kingsland, PharmD - PGY2 Pain Management and Palliative Care Pharmacy Resident - Summa Health System - Akron Campus
Pamela Moore, PharmD, BCPS; Sue Fosnight, RPh, BCPS, BCGP; Melissa Soltis, MD

UAN:

Learning Objectives:

1. Identify the impact of advanced heart failure on patients in an acute care hospital
2. Discuss the results of this quality improvement initiative

Purpose:
To describe the impact of Summa Transitions Excellence Program (STEP) application in the advanced heart failure (HF) population. Primary endpoints were 7 and 30-day readmissions. Secondary endpoints included length of stay (LOS), number of palliative care consults, and number of clinically significant interventions.

Methods:
This quality improvement initiative of pre-post design involved patients at Summa Health System - Akron Campus. Patients with HF were stratified based on readmission risk. Those at highest risk for readmission were included in the intervention group (IG) for admission and discharge medication reconciliation. Patients on existing STEP floors were excluded. Disease state or medication-related triggers prompted a palliative care consult recommendation.

Results:
A total of 92 patients were included in the IG. Differences in primary and the secondary endpoints of LOS and number palliative care consults were not statistically significant. There were 1.2 clinically significant interventions per patient (n = 112) within the IG. Incidental findings include, a shorter LOS for patients receiving the full STEP intervention compared to those receiving partial (4.9 versus 7.3 days; P = 0.015) and a higher number of patients converting code status to a comfort care approach when consulted to palliative care (21/29, 72.4% versus 21/63, 33.3%; P < 0.001). Patients with additional palliative care nurse intervention had a 10.5% (2/19) 30-day readmission rate, compared to those without (25/73, 34.2%; P = 0.04). Patients with a stable code status had a shorter LOS compared to those who changed code status (5 versus 7.5 days; P = 0.001).

Conclusions:
STEP and palliative consult trigger application in the advanced HF population at high risk for readmission resulted in non-statistically significant differences in primary and secondary endpoints. Alternative selection criteria and endpoints should be explored for future QI initiatives in this population. Incidental findings should be investigated further.

Opioid Sparing Effects of Calcitonin on Acute Fractures in the Inpatient Setting

Ashley M. Klarich*, PharmD, University Hospitals Geauga Medical Center
Mate M. Soric, PharmD BCPS

UAN:

Learning Objectives:

1. Address the need for new modalities of treatment in acute fracture pain
2. Discuss calcitonin's mechanism of action for analgesia in fractures
3. Explore literature evaluating calcitonin's efficacy in the treatment of pain associated with fractures
4. Define inclusion and exclusion criteria, methods, outcomes and implications for future research opportunities

Purpose:

The purpose of this study is to determine if the use of calcitonin within 24 hours of patient presentation decreases total daily consumption of oral morphine equivalents in fracture patients, and to determine if the use of calcitonin decreases mean daily pain scores.

Methods:

This is a retrospective cohort study evaluating calcitonin naïve patients receiving at least one dose of calcitonin within 24 hours of with or without the use of concurrent analgesic medications. Patients >18 years of age, receiving calcitonin within 24 hours of presentation, confirmed fracture diagnosis, and pain scores assessed utilizing the 0-10 numerical pain scale during calcitonin therapy will be included in this study. Exclusion criteria for participants includes preadmission calcitonin use. A study population of 130 patients in each group is needed to achieve 80% power to detect a 15mg total daily OME difference in opioid consumption for patients receiving calcitonin. Secondary endpoints include mean daily pain score and length of stay. Subgroup analyses include gender, ethnicity, and route of administration. Data analysis for secondary endpoints will utilize the student's t-test for continuous data, log-transformation for any positively skewed endpoint, chi-squared test for nominal data, and Fisher's exact test, when appropriate. A query of electronic health medical records within the University Hospitals Health System from 1/1/2012- 9/30/2018 was utilized.

Results:

Results and conclusions are pending completion of data collection and will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Results and conclusions are pending completion of data collection and will be presented at the Ohio Pharmacy Resident Conference.

Implementation of a Formal Registered Dietitian Referral Process for Patients with Diabetes in a Large Community Pharmacy Chain

Lauren E Klein, PharmD, Kroger Pharmacy/University of Cincinnati
Ashley Johnson, PharmD, BCACP; Erin Puening, PharmD, CDE; Bridget Wojciak, RDN, LD; Katelyn Johnson, PharmD, MS

UAN:

Learning Objectives:

1. Identify barriers to patients with diabetes being referred to and completing a visit with a registered dietitian
2. Discuss opportunities for pharmacists and dietitians to collaborate in managing patients with diabetes, including the implementation of a dietitian referral process in a community pharmacy

Purpose:
The primary purpose of this study is to increase interprofessional collaboration in managing diabetes by designing and implementing a referral process within a large grocery store chain from the pharmacy to a registered dietitian (RD) and determine if this results in increased patient engagement with an RD. The secondary objectives of this project are to evaluate participant nutrition score, a tool that analyzes healthfulness of grocery purchases, as well as the patient's experience with the pharmacy and the RD.

Methods:
Pharmacy personnel identified patients 18 years of age and older who have filled any oral or injectable diabetes medications in the past six months via reports from the electronic dispensing system. Patients were excluded if they did not have a diagnosis for prediabetes or diabetes, if they had gestational diabetes, or if they were currently enrolled in another program for diabetes care that includes a visit with the dietitian. The pharmacist discussed the importance of a visit with an RD and made a referral as appropriate. After the patient's first appointment, the RD sent a visit summary to the pharmacy that included any pertinent information needed for follow-up with the patient. The pharmacist followed up with the patient eight weeks after their initial appointment to complete a survey about the patient's experience. Data will be collected and organized using REDCap, a secure data collection tool that meets HIPAA compliance standards. Descriptive statistics will be used to analyze engagement with the RD and the patient's nutrition score.

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

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

Evaluation of Haloperidol for Abdominal Pain in the Emergency Department

Katherine Knudsen-Lachendro, PharmD, Cleveland Clinic Medina Hospital
Kyle Stith PharmD, BCPS; Laine A. Vicarel PharmD, BCPS; Brandon Mottice, PharmD, BCPS; Brittany Harbert, PharmD, BCPS; Baruch Fertel, MD, MPA, FACEP

UAN:

Learning Objectives:

1. Identify conventional treatments for nausea, vomiting, and abdominal pain
2. Describe why haloperidol is an appealing option for the treatment of abdominal pain

Purpose:

Drug shortages and the opioid epidemic are driving research of alternative treatments for pain, especially abdominal pain. Conventional therapy includes analgesics, antiemetics, and prokinetics. Haloperidol has been used to treat nausea and vomiting in palliative care, and as a structural derivative of meperidine, has potential analgesic properties. This study analyzes differences in morphine equivalent (ME) doses of opioid analgesia between self-matched patient encounters for abdominal pain in the emergency department (ED), one in which the patient received haloperidol plus conventional therapy (H+C-encounter), the other in which they received conventional therapy with opioids (C-encounter). Secondary endpoints include admission rate, ED length of stay, adverse events, differences in pain scores, readmission rates, and use of rescue medications.

Methods:

This retrospective cohort included patients ≥ 18 years old who received haloperidol 2 mg to 5 mg IM/IV for abdominal pain in the ED from July through November 2018 (H+C-encounter). Patients must have an additional ED encounter in which they received opioids for abdominal pain (C-encounter) within 1 year of their H+C-encounter. Patients undergoing abdominal surgery, had outpatient haloperidol prescriptions, or administered haloperidol for anything except abdominal pain were excluded. Seventy-five patients were needed to detect a 3 ME difference with 80% power and two-sided alpha of 0.05.

Results:

One-hundred and seven patients with self-matched encounters were included. Most patients were women (70%) and mean age was 41 years old. H+C-encounters had a statistically significant reduction in ME administered (median 0.0 [IQR 0.0-2.5] vs 5.7 ([IQR 4.0-8.0]; p

Conclusions:

Patients that received haloperidol had a statistically significant reduction in ME administered and lower admission rates when compared to encounters where they received conventional therapy with opioids. There were no differences in ED length of stay.

Safety and efficacy of early versus late initiation of anticoagulation following severe ischemic stroke

Anna Koseck, PharmD, Beaumont Hospital, Royal Oak
Jenna M. Holzhausen, PharmD, BCPS; Allycia M. Natavio, PharmD

UAN:

Learning Objectives:

1. Define hemorrhagic transformation and its associated risk factors
2. Describe considerations for evaluating timing of anticoagulation initiation following acute ischemic stroke

Purpose:
Following acute ischemic stroke (AIS), patients are at increased risk of recurrent ischemic stroke as well as hemorrhagic transformation. The likelihood of these complications must be considered when deciding on timing of anticoagulation initiation following AIS. Current guidelines support starting anticoagulation within 2 weeks of AIS but recommend delaying initiation further in patients with more severe strokes. The purpose of this study is to evaluate if early (≤14 days) versus late (>14 days) initiation of anticoagulation following severe AIS influences the incidence of intracranial hemorrhage or recurrent ischemic stroke.

Methods:
This retrospective chart review included AIS patients admitted to Beaumont Hospital, Royal Oak from 1/1/2014 - 6/30/2018 who had an initial National Institute of Health Stroke Scale (NIHSS) score of ≥16 and were started on anticoagulation within 30 days of stroke onset. Data collected included demographics, past medical history, initial NIHSS, stroke treatment, readmissions, and mortality. Primary safety and efficacy endpoints included incidence of hemorrhagic transformation and recurrent ischemic stroke within 90 days of stroke onset, respectively. Secondary endpoints included subgroup analyses of risk factors for these outcomes.

Results:
A total of 68 patients met study criteria (56 in the early anticoagulation group and 12 in the late). Recurrent ischemic stroke occurred in 3/56 (5.4%) patients in the early group and 0/12 (0%) in the late group (p-value 1.00). Hemorrhagic transformation occurred in 3/56 (5.4%) patients in the early group and 1/12 (8.3%) in the late group (p-value 1.00). Many baseline characteristics were similar between the groups with a few notable differences. Additional analysis is underway.

Conclusions:
In our limited study, there was no difference in incidence of hemorrhagic transformation or recurrent ischemic stroke between patients who were initiated on anticoagulation within 14 days of AIS or after 14 days. Larger, prospective trials are necessary to answer this research question.

Optimization of the Non-Formulary and Restricted Medication Request Process

Nicholas D Krabacher, PharmD - PGY1 Pharmacy Resident, St. Elizabeth Healthcare
Alicia M Gesenhues, PharmD, BCOP; Andrea C Schumann, PharmD

UAN:

Learning Objectives:

1. Discuss the benefits of standardizing non-formulary and restricted medication requests
2. Outline the process of updating formulary policies and procedures

Purpose:
Proactive formulary management leads to expedited turnaround times of medication requests, appropriate utilization of medications, improved patient safety, and decreased cost. Due to rapid new drug approvals and literature expansion, a vital part of formulary management is appropriate and timely handling of urgent requests for non-formulary and restricted medications. A medication classified as non-formulary is not preferred or regularly stocked in the institution. Restricted medications are approved for specific indications or within certain treatment areas. St Elizabeth Healthcare is a rapidly expanding system with multiple hospitals encompassing approximately 900 inpatient beds, 1 outpatient and 3 inpatient pharmacies, and routine system wide coverage for multiple physician specialties. Standardization of the non-formulary and restricted medication process will improve efficiency of request reviews and decrease system wide medication cost. This project aims to update the current process for urgent medication requests, thus improving medication utilization and patient safety.

Methods:
This prospective cost management assessment seeks to evaluate and update current formulary management within St. Elizabeth Healthcare. The primary aim of this evaluation is to standardize and increase efficiency surrounding non-formulary and restricted medications requests by utilizing current staff for clinical review, including pharmacy residents. Upon implementation, adherence to the process of non-formulary and restricted medications will be analyzed by auditing medication orders.

Results:
Implementation and analysis are currently on-going.

Conclusions:
Implementation and analysis are currently on-going.

Improving Bidirectional Communication: The Effect of a Warm-Handoff Transfer Between Ambulatory Pharmacists and Community Pharmacists for High-Risk Patients

Rebecca Lahrman, PharmD PGY2 Community Adminstration Resident at Kroger
Stacey Frede, PharmD, BCACP, CDE; Ana Hincapie, PhD; Suzi Francis, PharmD, BCACP, CDE; Rowena Schwartz, PharmD, BCOP; Kelly Epplen, PharmD, BCACP, FASHP; Pamela Heaton, BS, PhD2

UAN:

Learning Objectives:

1. Review value-based payment models and how community pharmacist can be involved
2. Explain what a warm-handoff is and what was specifically involved in a warm-handoff for this project

Purpose:
Comprehensive Primary Care Plus (CPC+) is an advanced primary care medical home model. To meet CPC+ care delivery requirements, ambulatory care pharmacists are working in primary care physician offices. In addition, primary care offices are partnering with community pharmacists to improve quality and reduce total cost of care. Community pharmacists provide a unique perspective in identifying patient barriers and optimizing adherence to care plans. Key to improving quality of care is consistent bidirectional communication. The most accessible means of bidirectional communication is a warm-handoff, defined as a personalized transfer of information between two providers. The goal of this project was to determine if using a structured warm-handoff protocol from ambulatory pharmacist-to-community pharmacist improved the process of patient care for high-risk patients. Specifically, the objectives were to 1) implement a warm-handoff process between ambulatory care pharmacists and community pharmacists, 2) evaluate the impact of the warm-handoff in the patient care process and 3) assess the impact of the warm-handoff on patient outcomes including hospitalization rates, readmission rates and emergency room visits.

Methods:
This cohort-controlled study examined the difference in standard of care compared to a warm-handoff between ambulatory care pharmacists and community pharmacists. The control patients received usual pharmacy care from the ambulatory pharmacists and the community pharmacists. The intervention patients received the structured warm-handoff using a bidirectional communication protocol between the ambulatory pharmacists and the community pharmacists. Objective one was measured by documentation rates of the warm-handoff. Objective two was measured by community pharmacist-documented follow-up for 30 days after the warm-handoff and satisfaction survey completed by the community pharmacist. Objective three was measured by hospitalization rates, readmission rates and emergency room visit between the control and intervention patients. The planned analysis will involve descriptive statistics and inferential statistics when appropriate for the 50 patients enrolled.

Results:
Data collection and results will be complete at the time of the Ohio Pharmacy Residency Conference.

Conclusions:
Conclusions will be presented at the conference.

Identifying Common Characteristics of a Shared Patient Population to Provide Ideas for Collaboration Between a Charitable Pharmacy and a Health System

Garrett Lambert, PharmD, PGY1 Community-Based Pharmacy Resident, Charitable Pharmacy of Central Ohio
Kristin A. Casper, PharmD, BCACP and Jennifer L. Seifert, MS, BCGP

UAN:

Learning Objectives:

1. Describe characteristics of the shared patient population utilizing a charitable pharmacy and a local health system including medications, disease states, and length of time as a patient at the pharmacy
2. Evaluate opportunities for future collaboration with the local health system based upon a better understanding of the shared patient population

Purpose:

Pharmacists are included as part of interprofessional collaboration (IPC) in a number of existing models such as patient centered medical homes and collaborative practice agreements. During the course of IPC, pharmacists are often involved in the care of underserved patients. The application of a community health needs assessment (CHNA) model as it relates to the development of collaboration between a charitable community pharmacy and a health system has not been described in the literature. Because the patient population of the Charitable Pharmacy of Central Ohio (CPCO) and the health system are similar and include underserved patients, the opportunity to positively impact patient care through IPC likely exists. By applying the first step of a CHNA model and compiling and summarizing information, this study aims to identify the most common characteristics including chronic disease states and conditions experienced by the shared patient population in order to strengthen IPC with the health system and improve care for underserved patients. The purpose of this project is to evaluate opportunities for future collaboration with the local health system based upon a better understanding of the shared patient population

Methods:

This study is a retrospective analysis of information available in the prescription processing system at a charitable pharmacy as well as an existing prescribing report of medications dispensed at the pharmacy during a four month period. Data collection includes dispensed medications, length of time as a patient at the pharmacy, prescriber information, and the office of the prescriber from which the prescriptions were generated. Data from the study will be analyzed for the most commonly occurring characteristics and will be used to develop targeted opportunities for enhanced patient care including collaborative practice agreements and integrated pharmacists' care at outpatient clinics.

Results:

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

Conclusions:

Data is currently being collected. Conclusions will be presented at the Ohio Pharmacy Residency Conference.

Evaluation of the efficacy and the safety of amiodarone duration after ventricular assist device implantation

Jennifer Lee, PharmD
Melissa Snider, PharmD, BCPS, CLS, BCACP; Marie Waddle, PharmD, BCACP; Ayesha Hasan, MD; Mahmoud Houmsse, MD

UAN:

Learning Objectives:

1. Identify common reasons for readmission after VAD implantation
2. Discuss the relationship between efficacy and safety and duration of amiodarone therapy after VAD implantation

Purpose:
To improve quality of life and survival rates in patients with advanced heart failure, a ventricular assist device (VAD) may be used as a bridge to heart transplant or a destination therapy. After VAD implantation, cardiac arrhythmia can be a common complication and is associated with increased morbidity and mortality. Studies report the incidence of ventricular arrhythmia is highest within 2-4 weeks of VAD implantation. Current guidelines state that antiarrhythmic agents may be useful in decreasing arrhythmia occurrence and implantable cardioverter defibrillator (ICD) firings, and specifically that chronic use of amiodarone may be reasonable to prevent recurrence of ventricular arrhythmias; however, evidence level is low and literature does not identify optimal duration of therapy nor account for potential drug associated adverse effects. The objective of this study is to evaluate which duration of amiodarone therapy is effective in preventing recurrent arrhythmia and is minimally associated with drug-induced adverse effects after VAD implantation.

Methods:
A single-center retrospective chart review was conducted. Adult patients 18-89 years old with previous history of arrhythmia who received VAD implantation between December 2008 to December 2018 and discharged with amiodarone monotherapy were included and sorted into different amiodarone duration arms. Patients were monitored up to maximum of 3 years after implantation, until cardiac transplantation, or death. The primary outcome is time-to-first and incidence of emergency department (ED) visits or readmission caused by arrhythmia after VAD implantation. Secondary outcomes include time-to-first and incidence of amiodarone-induced adverse effects and adverse effects warranting dose reduction or drug discontinuation. Exclusion criteria include age less than 18 years or greater than 89, pregnancy, and incarceration.

Results:
Data analysis is currently being conducted.

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

Quality Assurance Project Evaluating the Impact and Sustainability of Medication Therapy Management Services in a Primary Care Setting

Aaron LePoire, PharmD - PGY2 ambultory care pharmacy resident, Mercy Health St. Vincent Medical Center
Lisa McIntyre, PharmD, BCACP

UAN:

Learning Objectives:

1. Describe the impact of providing medication therapy management services in a primary care setting.
2. Discuss the sustainability of providing medication therapy management services in a primary care setting.

Purpose:
Studies have shown that medication therapy management (MTM) services have improved medication appropriateness and adherence, reduced health plan medication expenditures, lowered the risk of hospitalization, and reduced adverse drug events. Pharmacists in a primary care setting may have the opportunity for greater success with MTM interventions than the community pharmacy setting due to having direct access to the provider. The purpose of this quality assurance project is to evaluate the impact and sustainability of providing MTM services to patients in the primary care setting.

Methods:
This is a quality assurance project designed to assess a new service offering MTM services in both a family medicine and internal medicine physician office. In November 2018, a pharmacist led team consisting of one clinical pharmacist, one PGY2 ambulatory care pharmacy resident, one PGY1 pharmacy resident, and fourth year pharmacy students established a contract with OutcomesMTM to provide MTM services to patients of two primary care offices. MTM services are offered whenever a pharmacist is available in the office during the week. Data will be obtained through reports generated through the OutcomesMTM platform. Data from the reports will be used to assess uptake of the program within the pharmacist team and to analyze the impact of the MTM services on the standard of care for ambulatory care patients. Other outcomes assessed will include characterizing and quantifying the categories of MTM services billed, comparing the impact of the services between the two primary care offices, comparing the categories accepted or rejected by prescribers and patients, and quantifying the revenue generated by pharmacy personnel providing MTM services.

Results:
Data collection is ongoing with preliminary results to be presented at the 2019 Ohio Pharmacy Residency Conference.

Conclusions:
Conclusions will be presented at the 2019 Ohio Pharmacy Residency Conference.

Comparison of Apixaban vs Rivaroxaban on Patient Outcomes Involving Thromboembolism or Major Bleeding after Receiving Treatment Doses of Anticoagulation Therapy

Taylor A. S. Lewis, Pharm.D.
Jameela A. Aladimi, Pharm.D., CDE, Lindsay K. Benedik, Pharm.D., BCPS, BCGP, Marcie A. Malone, Pharm.D., Suzanne L. Van Fleet, Pharm.D.

UAN:

Learning Objectives:

1. Identify guideline recommendations regarding anticoagulant preferences for selected indications.
2. Discuss differences between apixaban and rivaroxaban despite being in the homogenous drug class of Factor Xa inhibitors.

Purpose:
Purpose: Many patients requiring anticoagulation are placed on Factor Xa inhibitors, specifically apixaban or rivaroxaban. Deciding whether to use apixaban versus rivaroxaban can be challenging given the paucity of data comparing these newer anticoagulants. The 2016 American College of Chest Physicians (CHEST) guidelines recommend direct oral anticoagulants (DOACs) over warfarin or low molecular weight heparin (LMWH) for the treatment of venous thromboembolism in the absence of cancer. Additionally, the 2019 American College of Cardiologists/American Heart Association/Heart Rhythm Society (ACC/AHA/HRS) recent guideline updates recommend DOACs over warfarin in atrial fibrillation, and warfarin or apixaban, specifically, in patients with end stage renal disease or on dialysis. Despite these recommendations, there is inconclusive evidence to recommend one DOAC agent over another. Although these medications are within the same drug class, they differ with regard to dosing and renal function cutoffs. Therefore, it is not surprising that bleeding and embolism rates between these two medications may differ. While Factor Xa inhibitors are gaining clinical momentum and preference as seen in current guidelines, limited comparative data for DOACs exist. The objective of this study is to evaluate differences in major bleeding rates between rivaroxaban and apixaban.

Methods:
Methods: A retrospective, single center chart review was conducted to determine the rate of major bleeding at one year between patients receiving apixaban and rivaroxaban. Secondary endpoints include minor bleeding, thromboembolism rates, and evaluation of patient specific factors on incidence of bleed or thromboembolism. It was hypothesized that apixaban would be associated with fewer major bleeding events than rivaroxaban.

Results:
Results and Conclusions: An analysis of major and minor bleed rates as well as rates of thromboembolism will be conducted. Additionally, a multivariate analysis will be done to assess the impact of body weight, renal function, and age. Finalized results will be presented at the Ohio Pharmacy Residency Showcase.

Conclusions:
Results and Conclusions: An analysis of major and minor bleed rates as well as rates of thromboembolism will be conducted. Additionally, a multivariate analysis will be done to assess the impact of body weight, renal function, and age. Finalized results will be presented at the Ohio Pharmacy Residency Showcase.

Factors affecting anti-Xa activity target attainment in critically ill patients on enoxaparin

Willy Li, PharmD - PGY-2 Critical Care Resident at Detroit Receiving Hospital
Raymond Yost, PharmD; Linda Park, PharmD, BCPS; Stacy Otremba, PharmD; Katri A. Abraham, PharmD, BCCCP

UAN:

Learning Objectives:

1. Describe the pathophysiology of venous thromboembolism and the different therapeutic options for prevention/treatment.
2. Discuss possible patient factors influencing non-target anti-Xa levels in critically ill patients on enoxaparin.

Purpose:
The purpose of this study is to evaluate the effectiveness of standard enoxaparin dosing in achieving target anti-Xa activity levels for venous thromboembolism (VTE) prophylaxis and treatment in the critically ill population and investigate possible patient-dependent factors influencing non-target anti-Xa activity.

Methods:
This is a retrospective study of patients admitted to Detroit Receiving Hospital, Harper University Hospital, and Sinai-Grace Hospital from January 2012 to June 2018, who received three or more serial doses of enoxaparin for VTE prophylaxis or treatment and had at least one measured anti-Xa activity peak level in the ICU. The primary outcome is proportion of peak anti-Xa activity levels within target range. Secondary outcomes include compliance to institution-specific monitoring guidelines for enoxaparin dosing, rate of bleeding events and heparin-induced thrombocytopenia (HIT), and predictors of non-target anti-Xa activity levels. Outcomes were analyzed using descriptive statistics. Multivariate logistic regression was used to identify predictors of non-target anti-Xa activity levels.

Results:
There were 320 anti-Xa activity levels screened. Of these, 169 levels from 121 patients were included for analysis, 98 patients with 121 levels in the treatment arm and 23 patients with 40 levels in the prophylaxis arm. Seventy-seven patients (63.6%) were placed on the correct starting regimen based on weight and creatinine clearance. Of those 77 patients, 40 (52%) had their first anti-Xa activity level within target range (0.5 to 1 activity units/mL). Of the 37 patients not in target range, only 17 patients received a dose adjustment and only 10 patients had a follow-up anti-Xa activity level rechecked. Overall guideline compliance for dose adjustments in response to anti-Xa activity levels was 60.9%. Guideline compliance for dose adjustments in response to non-target anti-Xa activity levels was 21.8%. Incidence of major bleeding was 10.6%, minor bleeding 4.0%, and HIT 0%. Subgroup analyses and predictors of non-target anti-Xa activity levels will be presented at Ohio Pharmacy Resident Conference

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

Use of nasal swab polymerase chain reaction (PCR) results to guide antibiotic de-escalation for the inpatient treatment of pneumonia

Lauren E. Lowery, PharmD The Christ Hospital
James M. Keeler, PharmD, BCPS; Angela Haskell, PharmD, BCPS

UAN:

Learning Objectives:

1. Identify risk factors for MRSA pneumonia
2. Discuss appropriate tools to guide antibiotic de-escalation

Purpose:
Current Infectious Diseases Society of America guidelines support the addition of vancomycin for the treatment of pneumonia based on pneumonia classification, patient risk factors, and local resistance patterns. Unnecessary vancomycin administration can increase adverse effects, cause bacterial resistance, and delay discharge. Use of methicillin-resistant Staphylococcus aureus (MRSA) nasal screening via PCR technology to discontinue vancomycin has been widely validated, with a negative predictive value reportedly 92-100%. The objective of this study was to assess the impact of an antimicrobial stewardship (AMS) initiative using MRSA nasal screening to guide discontinuation of vancomycin in patients with pneumonia.

Methods:
This single center study assessed the results of an AMS initiative utilizing MRSA PCR guided vancomycin discontinuation. The initiative followed patients admitted to select physician services August 2017-January 2018 (pre-initiative) or August 2018- January 2019 (post-initiative). These patients were stratified using the Charlson Comorbidity Index (≥3 points) and age (≥5 years), then matched 1:2 (post to pre-initiative). Pharmacists on the AMS team identified patients by vancomycin order for respiratory indication on targeted physician list, nasal screening results, and vancomycin order discontinuation. The electronic medical record was used for data collection. Primary outcomes include length of vancomycin therapy (hours), hospital stay (days), and total antibiotic therapy (hours). Secondary outcomes included acute kidney injury (24-hour increase in serum creatinine ≥0.3mg/dL), number of positive MRSA cultures, number of negative MRSA nasal screening results, cumulative vancomycin dose (g), initiation of anti-MRSA therapy (excluding doxycycline) for respiratory infections, 30-day readmission rates, transfer to an increased level of care, complete antibiotic regimen, and 30-day all-cause mortality.

Results:
All continuous data will be analyzed using the Student's t-test; descriptive statistics will be used to describe patient characteristics. Subgroup analysis will be performed to determine differences between physician groups. Results will be presented at the Ohio Pharmacy Resident Conference.

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

The Impact of University Hospitals Specialty Pharmacy (UHSP) Hepatitis C Patient Management Program on Patient and Pharmacy Outcomes.

Svetlana Lyamkin, PharmD. PGY1 Pharmacy Resident, University Hospitals Specialty Pharmacy
Rivka Katz, PharmD

UAN:

Learning Objectives:

1. Review the overall progression of hepatitis C, the common treatment options available for therapy, and when a patient is considered "cured".
2. Identify most common barriers associated with hepatitis C treatment and the challenges patients face throughout therapy.

Purpose:
This study describes the impact and success of University Hospitals Specialty Pharmacy (UHSP) and the role that clinical pharmacists play in managing patients with hepatitis C as measured by the incidence of documented sustained virological response (SVR) after therapy completion and documented patient adherence as compared with outcomes of patients who filled through outside specialty pharmacies.

Methods:
This was a retrospective analysis of adult patients in the University Hospitals Health System (UHHS) that were prescribed hepatitis C treatment between January 1, 2018 and June 30, 2018 and whose prescriptions were electronically sent to the UHSP. Patients who utilized UHSP for their hepatitis C treatment were managed by both the UHSP team and a clinical pharmacist working in the hepatology clinic. The primary outcomes measured the rate of documented sustained virological response after 12 weeks of completing therapy, as well as documented monitoring and adherence throughout therapy. Secondary outcomes focused on the time to prior authorization approvals, financial assistance implementation and the total out-of-pocket treatment cost for patients within UHSP.

Results:
One hundred forty-seven prescriptions for hepatitis C therapy were electronically prescribed to UHSP. A total of 63/147 (43%) patients were started on hepatitis C treatment and managed by UHSP. Out of the 63 patients started, 55(87%) patients completed therapy with 55/55 (100%) of them achieving a documented SVR compared to SVR rates reported from outside specialty pharmacies. Patient monitoring and follow-up was documented 86% of the time. Overall patient adherence to therapy was 91.6% at UHSP. The overall average turnaround time from when prescriptions were sent to the pharmacy to when they were dispensed was 20 days. This timeframe included the prior authorization approval process and financial assistance implementation.

Conclusions:
University Hospitals Specialty Pharmacy provides a comprehensive therapy management program for patients by procuring specialty medications, offering financial assistance, monitoring adherence, and encouraging compliance throughout therapy. The SVR rate of patients treated for hepatitis C at UHSP was 100% and supports the integrated specialty pharmacy model.

Comparison of 4-Factor Prothrombin Complex Concentrate Dosing Strategies for Emergent Reversal of Factor Xa Inhibitors

Eric R. Manning, PharmD, ProMedica Toledo Hospital/Toledo Children's Hospital
William B. Kirsch, PharmD, BCPS; Kristen B. Thomas, PharmD, BCPS

UAN:

Learning Objectives:

1. Review current treatment recommendations for emergent reversal of factor Xa inhibitors
2. Discuss dosing strategies of 4-factor prothrombin complex concentrate for emergent reversal of factor Xa inhibitors

Purpose:
There are limited treatment options when managing factor Xa inhibitor-induced major bleeds. Although 4-factor prothrombin complex concentrate (4F-PCC) has an off-label indication, optimal dosing remains unclear. The purpose of this study is to compare the safety and efficacy of two dosing strategies of 4F-PCC for reversal of factor Xa inhibitor-induced major bleeds.

Methods:
A retrospective chart review was performed to assess adult patients who received 4F-PCC for factor Xa inhibitor reversal due to a major bleed from November 1, 2016, to November 1, 2018. Patients were included if they were at least 18 years of age and received 4F-PCC for reversal of a factor Xa inhibitor-induced major bleed. Patients were excluded if they received 4F-PCC for any other indication, were less than 18 years of age, or had severe hepatic impairment. Patients who received 25 units/kg of 4F-PCC were compared to those who received 50 units/kg. The primary outcome was to assess the efficacy of 4F-PCC in each dosing group as evidenced by the need for re-dosing. Secondary outcomes assessed the incidence of thromboembolic and bleeding events within 14 days or until hospital discharge.

Results:
A total of 55 patients received 4F-PCC for the reversal of a factor Xa inhibitor-induced major bleed. Thirty-nine patients received 25 units/kg while 16 patients received 50 units/kg. No patients in either group required re-dosing with 4F-PCC. No documented thromboembolic or bleeding events occurred in either dosing group. Data analysis is ongoing, and final results will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:
To be presented at the 2019 Ohio Pharmacy Resident Conference.

Deployment of pharmacist-delivered chronic medication management in a primary care physician group

Samuel Martin, PharmD, PGY-1 Pharmacy Resident - Firelands Regional Medical Center
Dawn Fitt, RPh, Darla Gaiser, RPh FASCP, Rachael Macko, PharmD MBA, Kaitlynn Napholz, PharmD

UAN:

Learning Objectives:

1. Identify common barriers to successful medication review in a traditional outpatient setting
2. Discuss the benefits and potential barriers to providing pharmacist driven medication reviews within a primary care physician office

Purpose:
Pharmacists are increasingly involved in evaluating medication use in new patient settings. Pharmacists deliver comprehensive medication reviews in retail settings, oftentimes without access to patient health information. Specific metrics, known as Star-Ratings, evaluate insurance plans and provide data about the quality of their healthcare. Pharmacists have an opportunity to optimize some of these metrics through medication reviews provided in several other practice settings, including ambulatory care clinics and patient centered medical homes. This project aimed to study the impact of adding pharmacy services to a primary care physician group

Methods:
A pharmacist staffed in a primary care office over a three-month period providing clinical pharmacy evaluations in collaboration with primary care providers. Eligible patients were prescribed at least five medications and suffered from at least two chronic conditions. Each evaluation reviewed current medication therapy and assessed opportunities for intervention. Targeted interventions were broken into nine different categories. Recommendations for therapy optimization were discussed with the physician for approval. The primary outcome was the acceptance rate of pharmacist recommendations requiring a new physician order; secondary outcomes included number of recommendations by category and overall provider satisfaction.

Results:
Pharmacists saw a total of sixteen patients. In total, the pharmacists identified 112 medication related interventions. 50 were recommendations directed to the patient, and 62 recommendations required a new physician order. Of the 62 recommendations suggested to the provider, 34 (54.8%) were accepted. The three most common interventions documented were targeted medication education, unnecessary drug therapy, and indicated immunizations. Assessment of provider satisfaction is currently in progress.

Conclusions:
The addition of a pharmacist to a primary-care physician group can increase the number of medication related interventions identified during an office visit. Future studies should assess long-term clinical outcomes associated with pharmacist evaluation, such as rates of emergency room visits and hospital admissions.

Burnout and Resilience in the Community Based Pharmacist Practitioner

Kristine Mason, PharmD, MS
Bella Mehta, PharmD, FAPhA

UAN:

Learning Objectives:

1. Recognize the importance and impact of clinician burnout
2. Review community-based pharmacist burnout and workplace stressors by demographic subgroups
3. Discuss the role of organizations/employers in prevention of burnout

Purpose:
"As the United States healthcare system continues to go through rapid cycles of changes, more workplace pressure and stress are placed on healthcare providers. In addition to personal and societal stressors, increasing organizational and practice stressors may lead to Burnout Syndrome. Burnout Syndrome (burnout) is characterized by high levels of emotional exhaustion and depersonalization, and low levels of sense of personal accomplishment.

Most literature looking at burnout has primarily focused on whether burnout exists with physician providers and medical housestaff. The impact of burnout on physicians and medical residents, and the similarities to pharmacists and pharmacy residents reinforces the need for further research into the depth and impact of burnout on pharmacists."

Methods:
"Community pharmacists are frontline practitioners, who provide direct patient care. Many community pharmacists are challenged with job stressors such as balancing high dispensing volume and providing clinical services such as Medication Therapy Management and immunizations, while working long shifts with limited support staff. To assess burnout amongst community pharmacists in Ohio, the validated tools of Maslach Burnout Inventory (MBI) and the Areas of Worklife Survey (AWS) will be administered via Qualtrics™ to pharmacists in the community and ambulatory setting to assess burnout and workplace stressors. This study will be approved by The Ohio State University Institutional Review Board.

All pharmacists licensed in the State of Ohio will be invited to participate in the research project. Licensed pharmacists will be identified through a publicly available listserv through the State Board of Pharmacy. They will receive an email invitation to participate in an anonymous online survey. All pharmacists that self-identify as practicing in a community or ambulatory setting will be taken to the actual survey and for all others the survey will end. Participants electing to take the survey will be guided through an anonymous online assessment administered via Qualtrics™. The burnout assessment will evaluate pharmacists' emotional exhaustion, depersonalization, and personal accomplishment using the MBI; and will assess workload, control, reward, community, fairness, and values using the AWS. The MBI is a 22-item assessment, the AWS contains 28-items, and the supplemental demographic section contains 6-items. The survey will remain open for three weeks with three reminder emails being sent at the end of week one, end of week two, and middle of week three.

Inferential and descriptive statistics will be completed to evaluate pharmacists level of burnout, workplace stressors, and any contributing factors."

Results:
Data analysis in progress

Conclusions:

The results of this project will provide insight into burnout in community based pharmacist practitioners and allow employers to design appropriate interventions to address the specific areas of burnout.

The Impact of Face-to-Face Pharmacist Transitional Care Management Visits on Medication-Related Problems

Bianca Mayzel, PharmD - Cleveland Clinic Hillcrest Hospital
Sandra Axtell, PharmD, BCPS; Carolyn Richardson, PharmD, BCPS; Nicholas Link, PharmD, BCOP

UAN:

Learning Objectives:

1. Describe types of medication-related problems and their role in classifying barriers to adherence
2. Identify the role of the pharmacist in transitional care medicine in relation to medication reconciliations

Purpose:
Evaluators of adherence have found that the most common type of adherence issue involves patients taking medications inappropriately due to unawareness. These issues related to a medication regimen can be classified as medication-related problems (MRPs) and can be the underlying cause of non-adherence. The purpose of this study is to assess the rate of MRPs in patients receiving pharmacist led medication reconciliation in an ambulatory care clinic.

Methods:
This study involved a retrospective chart review of standard transitional care medicine (TCM) procedure at Cleveland Clinic Hillcrest Family/Internal Medicine clinic and a prospective, team-based TCM visit in the same clinic. Inclusion criteria for both groups consisted of patients discharged from any Cleveland Clinic Hospital and seen in the clinic. Exclusion criteria, in the treatment group only, consisted of patients not seen by the primary care doctor and pharmacist on the same day. The primary outcome was the difference in the rate of MRPs between the prospective and retrospective groups. Secondary outcomes included the number and specific type of MRPs found, classified by the Pharmaceutical Care Network Europe tool, and further subdivided by patient aware or unaware of MRP, as well as 30-day readmission rate.

Results:
Patients in the prospective group had an average age of 67.9 versus 65.5 in the retrospective group. Over 50% were female and Caucasian in both groups. Thirty-six (72%) patients had MRPs in the prospective group versus 9 (18%) in the retrospective, p

Conclusions:
Team-based TCM visits that included a pharmacist led medication reconciliation revealed more MRPs than patients who did not have a pharmacist perform a medication reconciliation.

Pharmacy Technician Involvement in Adherence Conversations for Star Ratings Medications in a Large Community Pharmacy Chain

Brandon McCrea, PharmD-PGY1 Pharmacy Resident with Kroger Health/University of Cincinnati
Joseph Wedig, PharmD, BCACP Ashley Johnson, PharmD, BCACP Michael Pleiman, PharmD, CDE Katelyn Johnson, PharmD, MS

UAN:

Learning Objectives:

1. Identify the role pharmacy technicians have in assisting pharmacists with adherence conversations.
2. Discuss the feasibility and barriers of a pharmacy technician led medication adherence program.

Purpose:
The purpose of this study is to develop, implement, and assess the feasibility of a pharmacy technician driven medication adherence program. The program aims to determine 1) if pharmacy technicians can effectively assist with adherence engagements in a community pharmacy and 2) the impact this program has on the completion and success of Star Ratings adherence interventions for hypertension (RASA), cholesterol (statin), and diabetes (non-insulin) medications.

Methods:
Pharmacy technicians with advanced clinical training underwent resident-led training to identify and conduct medication adherence interventions. Study participants were identified utilizing corporately loaded interventions in the electronic dispensing system identified as non-adherent to a Star Ratings medication, which were displayed in workflow as part of an existing adherence program. Once the pharmacy technician engaged the patient for the adherence intervention, the technician utilized a HIPAA compliant REDCap software preloaded with logic-based questions to help guide the adherence encounter according to patient responses. The pharmacy technician recorded patient responses, identified potential barriers of non-adherence, and documented recommendations of services that support adherence, such as 90 day conversions, automatic refill services, and medication synchronization enrollment. During adherence conversations, technicians consulted the pharmacist as appropriate. Pharmacy technicians documented and submitted the interventions in the electronic dispensing system. Descriptive statistics will be used to analyze the primary outcome of the feasibility of pharmacy technicians assisting in the completion of Star Ratings medication adherence interventions by assessing the number of interventions completed and an assessment of corresponding resolution codes to determine the outcome of an intervention. The primary outcome will be assessed for the duration of the study period compared to the same time period the year prior.

Results:
Data is currently being collected and analyzed.

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

Opioid prescribing trends of discharge prescriptions in the emergency department before and after provider education

Adrian E. McKinney, PharmD - PGY1 Pharmacy Resident, Blanchard Valley Hospital
Sarah Tong, PharmD, BCPS, BCCCP; Kristin Spangler, PharmD, BCPS; Tenna Rhonemus, BSPharm, BCGP

UAN:

Learning Objectives:

1. Review Ohio rules and regulations regarding prescribing of opioid analgesics
2. Discuss recommendations on opioid prescribing in the emergency department

Purpose:

In August 2017, the State of Ohio implemented new rules for prescribing opioid analgesics for the treatment of acute pain limiting prescriptions to no more than a seven-day supply. Additionally, the Ohio Guidelines for Emergency and Acute Care Facility Opioid and Other Controlled Substances (OOCS) Prescribing recommends that prescriptions should be limited to a three-day supply. The objective of this study is to determine if there is a decrease in prescribing of opioid medications in the emergency department after provider education.

Methods:

This study was approved by the Institutional Review Board at Blanchard Valley Hospital and conducted from October 2018 to March 2019. The electronic medical record was used to identify patients that were discharged from the emergency department with a prescription for an opioid. The following data was collected: patient age, gender, prescribing physician, opioid medication, directions, quantity, days supply of discharge prescription, and ICD-10 diagnosis code. The Ohio Automated Rx Reporting System was used to identify previous opioid medications prescribed for each patient. Following the initial data collection from October to November 2018, an in-service was completed in December with the emergency medicine providers to educate on safe prescribing of opioids, recommendations from professional organizations, changes in Ohio law relating to prescribing of opioids, and information on how to interpret the prescription drug monitoring program report. Following the in-service the same data was collected prospectively from February to March 2019. The primary outcome of this study is to determine if there is a decrease in prescribing after education is complete. The secondary outcome is to determine if there is a step up in therapy when the patient is already on an opioid medication.

Results:

Data is currently being collected and analyzed.

Conclusions:

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

Assessment of opioid usage before and after the implementation of opioid prescribing limits in acute pain management

Rebecca K McKinney, PharmD - St. Elizabeth Healthcare
Emily Lodwick, PharmD, BCPS; Andrea Schumann, PharmD

UAN:

Learning Objectives:

1. Discuss the prevalence of opioid misuse and abuse nationally
2. Identify methods to decrease the prescribing of opioids in the healthcare system

Purpose:
Discussion of the opioid epidemic has been increasing over past years in various healthcare settings. Multiple strategies are being implemented to decrease the amount of opioids that are being prescribed to patients in inappropriate amounts and situations. This study will aim to determine the changes in prescribing of opioids in the emergency department after prescribing limits are implemented. This study will also evaluate changes in inpatient opioid usage after order sets are revised to include multimodal pain regimens.

Methods:
Data collection was performed by retrospective chart review from August 2018 – September 2019 prior to implementation of opioid prescribing limits in the emergency department and from November 2018 – December 2018 post-implementation of prescribing limits. Comparison was done between pre- and post-implementation based on the pain medications prescribed at discharge, pain medications received while in the emergency department, and the amount of opioids prescribed at discharge in oral morphine equivalents and days of therapy.

Order sets with pain regimens that were used most often inpatient were identified to be revised to include multimodal pain regimens. Retrospective chart review will be performed on inpatients that are prescribed the order sets to calculate the amount of opioids received in oral morphine equivalents before and after the order sets have been revised.

Results:
Data collection and analysis are currently being conducted; results and conclusions will be

presented at the Ohio Pharmacy Resident Conference.

Conclusions:
Data collection and analysis are currently being conducted; results and conclusions will be

presented at the Ohio Pharmacy Resident Conference.

Incidence of acute kidney injury associated with duration of vancomycin and piperacillin/tazobactam combination therapy

Lisanne McMullen, PharmD - PGY1 Pharmacy Practice Resident at Mercy Medical Center
Rachael Craft, PharmD, BCIDP; Mackenzie Tenkku, PharmD, BCPS

UAN:

Learning Objectives:

1. Identify resistant pathogens and common empiric antibiotic regimens.
2. Review literature regarding the concern for acute kidney injury risk with vancomycin and piperacillin/tazobactam therapy.

Purpose:
Empiric antibiotic therapy for serious infections often requires coverage for resistant pathogens, including methicillin-resistant Staphylococcus aureus (MRSA) and Pseudomonas aeruginosa. These regimens commonly consist of vancomycin plus an antipseudomonal beta-lactam. Recent studies have reported increased acute kidney injury (AKI) risk associated with concomitant vancomycin and piperacillin/tazobactam therapy compared to each agent alone and other empiric regimens covering for MRSA and Pseudomonas. Additionally, limited information is available regarding the duration of therapy and how this may contribute to AKI risk. The objective of this study is to determine if vancomycin and piperacillin/tazobactam combination therapy has an increased AKI incidence compared to vancomycin plus cefepime or meropenem. Furthermore, data will be analyzed to determine if there is a specific duration of combination therapy that is associated with an increased AKI incidence.

Methods:
A retrospective cohort study was conducted analyzing patients who received vancomycin in combination with piperacillin/tazobactam, cefepime, or meropenem between January 1st, 2018 and June 30th, 2018. Data was collected using the electronic medical record at Mercy Medical Center. Adult patients with normal baseline renal function and receipt of at least 48 hours of combination therapy with the two antibiotics initiated within 24 hours of one another were included in this study. Acute kidney injury events, defined by the Risk, Injury, Failure, Loss, End Stage Renal Disease (RIFLE) and Acute Kidney Injury Network (AKIN) criteria, during antibiotic therapy and up to 72 hours after antibiotic discontinuation were recorded. This data was used to calculate the AKI incidence with each regimen and AKI incidence associated with each day of therapy.

Results:
Data analysis is currently in progress. Results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:
Data analysis is currently in progress. Results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Characterization of the off-label use of select programmed death (PD)-1/PD-ligand (L)-1 inhibitors in gynecologic malignancy, associated toxicities and identification of predictors of response

Lori Melikian, PharmD PGY1 Clinical Pharmacy Resident Cleveland Clinic Fairview Hospital
Lu Wang, MS Bernadette Clark, PharmD, BCOP, BCPS Kelly Fargo, PharmD, BCPS

UAN:

Learning Objectives:

1. Describe the background, study rationale and objectives of the study
2. Report the use of PD-1/PD-L1 inhibitors at Cleveland Clinic Cancer Centers

Purpose:
The purpose is to characterize the off-label prescription of PD-1/PD-L1 inhibitors in gynecologic malignancies at Cleveland Clinic facilities in Ohio. Objectives of this study are to identify potential predictors of response and determine the incidence and severity of adverse events.

Methods:
This study is a retrospective chart review. Data for characterization was descriptive and included drug, diagnosis, genetic/biomarker testing and toxicity information. Data related to response included time to and reason for discontinuation. All toxicities related to the agent were rated and given a CTCAE grade while toxicities not related were given a Naranjo score.

Results:
Upon review, the final cohort consisted of 44 patients. Preliminary results indicate the following cancer diagnoses: ovarian (52%), endometrial (25%), cervical (9%), fallopian (6.8%), and vulvar (6.8%). The most commonly prescribed off-label agent was nivolumab in 35 (80%) patients. Twenty-eight (66%) patients discontinued therapy due to disease progression while 4 (9%) discontinued due to toxicity. In the group that experienced progression during the study period, 22 patients (50%) were discontinued prior to 12 weeks of treatment. The average time on therapy for this subgroup was 1.5 months. The most common side effect was fatigue (39; 88.6%). The most common laboratory change was elevations in TSH (19; 43.2%). Of those that continued treatment past 12 weeks, the average time on therapy was 4.1 months. Nine (41%) patients remain on therapy at the end of the study period.

Conclusions:
In this study, 50% of patients were discontinued prior to the iRECIST recommendations and therefore warrant further evaluation. Due to the potential side effect profile and lack of robust data, the decision to initiate treatment is multifactorial and quality of life should be considered.

Evaluating antipsychotic use for intensive care unit delirium in an academic medical center: a focus on transitions of care

Sean W Mertz, PharmD - PGY1 Resident Beaumont Hospital, Royal Oak
Allycia M Natavio, PharmD; Alexandra M Serafino, PharmD

UAN:

Learning Objectives:

1. Discuss appropriate delirium assessment in critically ill patients
2. Identify the risks associated with antipsychotic therapy

Purpose:
Many patients in intensive care units (ICUs) experience delirium, a condition characterized by changes in mental status. Delirium is associated with negative outcomes such as prolonged hospital stay and increased mortality. Current guidelines state patients with agitated delirium may benefit from short-term use of antipsychotics. Although delirium is a temporary condition, some patients are inappropriately continued on antipsychotics long-term. The purpose of this study is to characterize the incidence of antipsychotic continuation following patient transfer out of the ICU and at hospital discharge.

Methods:
This was a single-center, retrospective cohort, evaluating adult patients who received an antipsychotic while in an ICU. Patients were excluded if they were taking an antipsychotic prior to ICU admission or for a reason other than delirium. Data collection included patient demographics, hospital stay, antipsychotic regimen, delirium assessments, risk factors for delirium, sedation regimens, and discharge disposition. The primary outcome was the continuation of antipsychotics following transfer out of the ICU and at hospital discharge. Preliminary secondary outcomes included characterizing the specific antipsychotic being continued.

Results:
A total of 267 patients were included with a mean age of 73.1 years. Almost half of patients were surgical (132, 49.4%). The average ICU length of stay was 12.1 days. Of patients who survived their ICU stay (n=254), almost half were continued on an antipsychotic following transfer out of the ICU (114, 44.9%). Of patients who survived their hospital stay (n=236), antipsychotics were prescribed at discharge in a small number of patients (12, 5.1%). The most common medication regimens continued were as needed haloperidol (57, 42.9%) and scheduled quetiapine (60, 45.1%).

Conclusions:
Almost half of the patients initiated on an antipsychotic for ICU delirium had the medication continued upon transfer out of the ICU, but very few patients were discharged from the hospital on an antipsychotic.

Efficacy of Intravenous Diltiazem versus Metoprolol for Rate Control of Acute Atrial Fibrillation with Rapid Ventricular Rate in the Emergency Department

James T. Middendorf, PharmD--UC Health: West Chester Hospital
Marcie A. Malone, PharmD; Caitlin E. Pfaff, PharmD, BCPS; Hanna B. Earich, PharmD;

UAN:

Learning Objectives:

1. Review pathophysiology of atrial fibrillation with rapid ventricular rate.
2. Describe acute atrial fibrillation with rapid ventricular rate management in the emergency department.

Purpose:
Atrial fibrillation (AF) with rapid ventricular rate (RVR), defined as heart rate exceeding 100 beats per minute (bpm), is an arrhythmia characterized by rapid and disorganized atrial conduction resulting in loss of synchronized atrial contraction and reduction of cardiac output. In patients presenting to the emergency department (ED), severe sequelae such as hemodynamic instability and death can manifest if prompt recognition and treatment is not initiated. For rate control pharmacologic management, intravenous (IV) diltiazem and metoprolol have become mainstays of treatment; however, conflicting data on safety and efficacy exist.

Methods:
This single-center, retrospective study evaluated patients who presented to an academic affiliated community ED and received IV diltiazem or IV metoprolol for treatment of AF with RVR. The primary outcome compared the proportion of patients achieving a heartrate < 110 bpm 30 minutes after study drug administration. Secondary outcomes included rate control at 60 minutes post-administration and select safety endpoints.

Results:
The study enrolled 106 patients, 53 patients in each group. No significant differences were observed between groups with respect to baseline characteristics with the exception of heartrate (diltiazem 140 bpm [IQR 26.5] vs metoprolol 126 bpm [IQR 19.5]; p = 0.006). There were no differences between groups in achievement of rate control at 30 minutes (27 [50.9%] diltiazem vs 27 [50.9%] metoprolol, p=0.846). No differences were observed between groups regarding rate control at 60 minutes. More patients in the diltiazem group experienced bradycardia 10 [18.9%] diltiazem vs 2 [3.7%], metoprolol; p = 0.032).

Conclusions:
This study demonstrated no difference between diltiazem and metoprolol in achievement of rate control within 30 minutes in acute AF with RVR. Given the observed efficacy rate was lower than anticipated, no definitive conclusions can be made from this study.

Evaluating the impact of a pharmacist directed procedure on appropriate vaccination of high-risk patients in an inpatient setting

Juliet P. Milburn, PharmD, PGY1 Pharmacy Resident, St. Elizabeth Healthcare
Charles A. Harvey, Pharm.D., BCPS

UAN:

Learning Objectives:

1. Explain why patients with a history of intravenous drug abuse and asplenia are at increased risk for infections preventable by vaccination
2. Report the impact of pharmacist directed procedures in improving vaccination status of these patients at high risk for infection

Purpose:

Vaccinations are highly effective at preventing many diseases, but many patients are not appropriately vaccinated due to cumbersome vaccination schedules and lack of follow up. This is particularly problematic for individuals at increased risk for infections, including patients with functional or anatomical asplenia or with history of intravenous drug use (IVDU). Two pharmacist directed procedures initiated by the antimicrobial stewardship team were designed to bridge this gap and increase vaccination administrations in these two patient populations. The purpose of this project is to determine the impact of these procedures at improving vaccination rates in these patient populations.

Methods:

A two-armed retrospective chart review was performed for each procedure and compared information collected before and after protocol implementation. For one arm, all patients with an ICD-10 code diagnosis of congenital or post-surgical asplenia from 5/1/2018 to 12/31/2018 were included. For second arm, all patients admitted to a unit dedicated to long term intravenous antibiotic treatment and a history of IVDU from 5/1/2018 to 12/31/2018 were included. For both arms, the following information was collected: age, length of stay, sex, race, vaccinations indicated, vaccinations ordered, and vaccinations received during admission. The primary endpoint for both arms was defined as difference in number of indicated vaccinations received during admission before and after protocol initiation. Secondary endpoints included adherence to procedure, percentage of vaccines ordered in post analysis by pharmacists, number of missed vaccinations opportunities during admission, and unnecessary vaccines received during admission.

Results:

Data collection and analysis are currently being conducted. Results will be presented at the 2019 Ohio Pharmacy Resident Conference (OPRC).

Conclusions:

Pending analysis of results, conclusions will be presented at the 2019 OPRC.

Retrospective study of an unfractionated heparin dosing protocol in venous thromboembolism in the morbidly obese

Rachael D. Miller, PharmD, PGY1 Resident, Mercy Health - Fairfield Hospital
Brie Baker, PharmD, BCPS, Mercy Health - Fairfield Hospital

UAN:

Learning Objectives:

1. Describe the importance of dosing heparin safely and effectively in venous thromboembolism (VTE)
2. Discuss the lack of guidance on dosing morbidly obese patients with heparin for VTE

Purpose:
Unfractionated heparin has been widely used for the treatment of VTE for many years. The exact incidence of VTE is unknown in the United States but has been reported to affect as many as 600,000 people (1 to 2 per 1000) each year. According to the 2012 CHEST guidelines, when treating VTE with heparin, a weight-based dosing protocol is recommended. However, the guidelines do not indicate whether actual, ideal, or an adjusted body weight should be used for dosing in patients who are overweight, obese, or morbidly obese. Several studies have investigated if there is a difference in outcomes between heparin dosing in obese and nonobese patients. In these studies, some found significant differences with activated partial thromboplastin time (aPTT) values and bleeding outcomes, while others did not.

Due to unclear dosing in the guidelines and conflicting data from previous studies, our aim is to determine if morbidly obese patients at Mercy Health - Fairfield Hospital with VTE are receiving heparin doses that align with our institution's aPTT goals.

Methods:
This study is a retrospective cohort study of initial aPTT in patients 18 years or older who were diagnosed with VTE on admission through the emergency department and treated with high dose heparin protocol between June 1, 2018 – March 31, 2019. The heparin dosing in Fairfield's protocol is supported by the CHEST guidelines. Participants were split into two groups: morbidly obese and non-morbidly obese. The World Health Organization definition for Class III obesity, commonly known as morbid obesity, with a body mass index cutoff of greater than 40 was used. The primary outcome of the study is the percentage of patients experiencing initial aPTT above therapeutic range (aPTT greater than 90). The secondary outcomes include time to therapeutic aPTT (aPTT 54-90), percentage of patients experiencing initial aPTT greater than 248, and mean initial aPTT.

Results:
Research is still in progress.

Conclusions:
Research is still in progress.

Multi-Center Study on Prescribing Errors Intercepted by Pharmacists

Sarah A. Miller, PharmD - PGY1 Pharmacy Resident, University Hospitals Ahuja Medical Center
Jodie Fink, PharmD, BCPS

UAN:

Learning Objectives:

1. Describe the impact of pharmacists on intercepting prescribing errors
2. Discuss standardized metrics that can be implemented to quantify pharmacists' impact on patient safety

Purpose:
Medication errors are very common despite increased attention to the topic; a hospitalized patient is subject to approximately one medication error every day, and medication errors cost healthcare systems billions of dollars each year. Five risk points for the medication use process have been defined: prescribing, transcription, dispensing, monitoring, and administration. Multiple studies have confirmed the high incidence of prescribing errors as well as the opportunity for pharmacists to intervene. There are currently no standardized metrics to measure the impact of pharmacists in preventing patient harm. This multi-center study, coordinated by Vizient University Health Consortium, will assess prescribing errors intercepted by pharmacists at 45 hospitals nationwide.

Methods:
A standardized methodology will be utilized to determine the prevalence and severity of prescribing errors. During the 6-week data collection period, pharmacists documented interventions describing the intercepted prescribing error and associated potential severity for patient harm in the electronic medical record. Standardized categories of prescribing errors were used to categorize the error. Severity ranking has been adapted from the NCC MERP Index. To validate the data, a second pharmacist independently categorized the prescribing error and severity ranking associated with the case. A physician will be involved in reviewing the prescribing error severity congruence for all potentially life-threatening cases and a percentage of serious potential for harm. Pharmacist-led services, such as vancomycin and renal dosing policies, will be excluded from the aggregate data. Data analysis will include number of errors intercepted per patient days, most common categories of errors, most common medication classes involved, and the potential for severity of harm of errors.

Results:
Preliminary results suggest that pharmacists intervened most frequently on medication reconciliation errors.

Conclusions:
Site-specific final results and conclusions will be reported at the 2019 Ohio Pharmacy Residency Conference.

Comparison of continuous versus intermittent pantoprazole dosing in upper gastrointestinal bleeding: A retrospective cohort

Caitlin Mills, PharmD - Cleveland Clinic Fairview Hospital
Lori Rose, PharmD, BCPS; Lu Wang, MS

UAN:

Learning Objectives:

1. Explain the role of intermittent pantoprazole dosing in the treatment of upper GI bleeding
2. Describe the cost savings that can result from intermittent dosing compared to continuous infusion treatment

Purpose:
Due to national drug shortages, minibags that were used to prepare proton pump inhibitor (PPI) continuous infusion products for the treatment of upper gastrointestinal (GI) bleeding became unavailable in 2017. There are few studies available to evaluate alternate dosing strategies, however, twice daily dosing of PPIs became the treatment standard for many hospitals. The objective of this study is to evaluate differences between intermittent dosing versus continuous infusion pantoprazole for the treatment of upper GI bleeding.

Methods:
Data for each dosing regimen was collected in 8-month blocks based on the timing of the minibag shortage. Adult patients were identified from Fairview hospital in Cleveland, Ohio, who were admitted for upper GI bleeding and underwent endoscopic evaluation. A variety of data was collected including, but not limited to, the cause of GI bleeding, changes in hemoglobin, platelet count at time of diagnosis, the use of NSAID's, ASA, or anticoagulants, and patient specific factors. Differences in rebleeding within 7 days of treatment, length of stay, need for surgical intervention, transfusion requirement, in-hospital mortality, and cost of treatment were evaluated between groups.

Results:
One-hundred and ninety-one patients were included in this retrospective trial. No difference was seen in rebleeding rates within 7 days of treatment, length of stay, need for surgical intervention, transfusion requirement, or in-hospital mortality. A statistically significant difference was seen in the cost of treatment, in which the intermittent treatment group saved on average $13.00/patient.

Conclusions:
Limited differences were seen between the two dosing groups in clinical outcomes showing intermittent dosing of pantoprazole does not sacrifice patient safety. Cost saving seen gives additional support to the continued use of this dosing strategy post-minibag shortages. To determine if there is truly no clinical difference between the two dosing strategies, a non-inferiority study would need to be completed.

Implementation and evaluation of a pharmacist-driven chronic obstructive pulmonary disease care bundle at a community hospital

*Jenna M Mills, PharmD – PGY1 Pharmacy Practice Resident at Lima Memorial Health System
Brett A Randolph, RPh, MBA; Jeremy A Ebert, PharmD, BCPS; Karen L Kier, PhD, MSc, BCPS, BCACP

UAN:

Learning Objectives:

1. Recall the components of a chronic obstructive pulmonary disease care bundle delivered by pharmacists in the inpatient setting
2. Identify a comprehensive care bundle using a multidisciplinary team approach for chronic obstructive pulmonary disease across inpatient and outpatient settings

Purpose:

Acute exacerbations of chronic obstructive pulmonary disease (COPD) contribute to disease progression, future exacerbations, morbidity, mortality, and rehospitalization. The benefit of clinical pharmacy services during hospital stay and the 30-day post-discharge period has demonstrated reduced 30-day all-cause hospital readmission rate. However, pharmacy and multidisciplinary contributions coupled together to form a comprehensive COPD care bundle have yet to be evaluated. The purpose of this study is to determine if a pharmacist-led, multidisciplinary COPD task force's delivery of a comprehensive COPD care bundle decreases 30-day all-cause hospital readmission rate at a 329-bed community hospital.

Methods:

A multidisciplinary COPD task force delivered a comprehensive COPD care bundle consisting of medication reconciliation, insurance formulary review, co-pay assistance, smoking cessation counseling, and education over a 6-week period. Pharmacists assessed medication-related knowledge, potential barriers to treatment, and symptom severity at admission. During hospitalization, focus was placed on facilitating medication affordability and patient understanding of their inhaler regimen, as well as coordinating outpatient provider follow-up. Student pharmacists called patients 2-3 days and 14 days after discharge to follow-up on their COPD care plan. The medication-related knowledge and symptom severity assessments were re-administered at the end of the 14-day phone call. Partnership with a local college of pharmacy assisted with conducting post-discharge phone calls. The primary outcome of this study is 30-day all-cause hospital readmission rate in the intervention group compared to a historical control. Secondary outcomes include change in medication-related knowledge, change in symptom severity, COPD task force adherence to the COPD care bundle, and provider usage of the COPD care bundle.

Results:

Data analysis is in progress. Results will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Change in hemoglobin A1c following pharmacist provided education for type 2 diabetics in a community hospital

Amy Milo PharmD, PGY-1 Pharmacy Resident, Western Reserve Hospital
*; Kathryn Corlett, PharmD, BCPS; Courtney Hochman, PharmD, BCPS; Erin Onder, PharmD, BCPS; Karen Kier PhD, M.Sc., BCPS, BCACP,TTS

UAN:

Learning Objectives:

1. Discuss the role of diabetes self-management education on patient outcomes
2. Discuss the impact of pharmacist provided diabetes education on hemoglobin A1c

Purpose:

According to the 2017 Diabetes Statistics Report from the Centers of Disease Control and Prevention (CDC), it is estimated that 28 million people have type 2 diabetes (T2D); 15.6% of which are not achieving a hemoglobin A1c (A1c) of 9% or less.1 Literature has shown that poor diabetes self-management and medication non-compliance leads to increased healthcare utilization.2-3 Evidence supports the inclusion of pharmacists in interdisciplinary diabetes education.5 The Western Reserve Hospital (WRH) standard of care is to provide T2D patients with thorough education prior to discharge. The purpose of this study is to evaluate the change in A1c for T2D patients following consistent discharge education provided by an interdisciplinary team, including a pharmacist. The primary outcome is to evaluate the change in A1c three months post discharge in T2D patients that receive education by a pharmacist. The secondary outcomes are hospital readmission rates for the study participants at 30 and 90 days

Methods:

A quality improvement project was initiated in October 2018, when a multidisciplinary team began providing consistent discharge education to T2D patients. This project was exempted by the Western Institutional Review Board. Patients were included in the study if they were 16 and older, English speaking, discharged to home, and had T2D with an A1c ≥ 8% within 90 days of admission. Patients were excluded if they had type 1 diabetes, delirium or dementia. A retrospective chart review was conducted for patients admitted to WRH from October through December 2017 based on inclusion criteria as a control group. The intervention group was patients admitted to WRH from October through December 2018. Outpatient medical records were reviewed to determine if an A1c was collected approximately 3 months post-discharge. Data collected included age, race, sex, oral and parenteral anti-diabetic medications, hospital obtained A1c, post-discharge A1c, and primary care physician. Patient data was de-identified and compared between groups to determine effectiveness of education.

Results:

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

Conclusions:

Effect of early emergency room discharge of low-risk VTE patients on total hospital cost and length of stay

Leeanne M. Mobayed, PharmD, PGY-1 Resident, Aultman Hospital
Scott Perry, PharmD, BCPS; Rebecca Prewett, PharmD, BCPS

UAN:

Learning Objectives:

1. Review the background literature supporting early emergency room discharge for patients presenting with low-risk deep vein thrombosis (DVT) and pulmonary embolism (PE).
2. Discuss the potential for reduced healthcare costs and length of stay of low-risk VTE patients.

Purpose:
The purpose of this project is to assess length of stay and total healthcare costs after implementation of a pharmacist driven protocol promoting early emergency room discharge with a direct oral anticoagulant for patients with low-risk deep vein thrombosis (DVT), and to determine the potential cost benefit of applying this protocol to patients presenting to the emergency room with low-risk pulmonary embolism (PE).

Methods:
This retrospective chart review was approved by the Institutional Review Board. Patients presenting to the emergency room with a DVT in 2018 were evaluated for appropriateness of inpatient admission, appropriateness of early discharge, length of stay and cost. This data was then compared to data from an internal study completed in 2016 to determine if inappropriate admissions, length of stay and total healthcare costs decreased after implementation of a pharmacist driven protocol promoting early emergency room discharge for low-risk VTE patients. Patients presenting to the emergency room with a pulmonary embolism were evaluated for qualification for early emergency room discharge. Average cost of these admissions was compared to the expected cost for a patient directly discharged from the emergency room to determine hypothetical total healthcare cost reduction with early emergency department discharge.

Results:
Preliminary results showed zero inappropriate admissions for patients presenting to the emergency room with a low-risk DVT, likely indicating a significant decrease in length of stay and total cost for patients discharged from the emergency room with direct oral anticoagulation. 26.7% of PE patients presenting to the emergency room qualified for early discharge on direct oral anticoagulation. Formal analysis of potential cost reduction is currently in progress.

Conclusions:
A pharmacist driven protocol promoting early emergency room discharge for low risk VTE patients may decrease rate of inappropriate admission, length of stay and total healthcare cost.

Optimization of Pain and Sedation Weaning in Pediatric Patients

Alyssa Mohler, PharmD-ProMedica Toledo Hospital/Toledo Children's Hospital
Hannah Goldstein, PharmD, BCPS and Kenneth Hecht, PharmD, BCPS

UAN:

Learning Objectives:

1. Review current recommendations for sedation and analgesia weaning regimens in pediatric patients.
2. Discuss the use of methadone and clonidine as treatment for iatrogenic drug withdrawal in pediatric patients.

Purpose:
Children admitted to the intensive care unit often require sedation to facilitate mechanical ventilation. Despite their widespread use, however, the optimal strategy for weaning sedation and analgesia in pediatric patients remains unclear. Regimens are often based on physician preference, which can lead to highly variable results. Strategies include converting to oral formulations, substituting with long-acting formulations, and decreasing daily dose by 10-20% every 24-48 hours. The purpose of this study was to identify characteristics of an effective wean.

Methods:
A retrospective chart review was conducted to investigate the characteristics of sedation and analgesia weaning regimens in pediatric patients at risk for withdrawal. Patients were considered at risk for withdrawal and included if they received a continuous infusion of fentanyl, morphine, or dexmedetomidine for ≥72 hours. Patients were excluded if they experienced non-iatrogenic withdrawal, or if they received an opioid via patient-controlled-analgesia during the same admission. Patients were stratified into three treatment groups based on duration of continuous sedation prior to weaning; 10 days, respectively.

The electronic medical record was used to collect all data, including patient demographics and recorded clinical data. Duration of continuous infusions and maximum infusion rates as well as concurrent pain or sedation medications were recorded for each patient. Additional data collected includes methadone and clonidine weaning regimens, Withdrawal Assessment Tool Version 1 (WAT-1) scores, rescue doses given for withdrawal, documented withdrawal symptoms, intensive care unit and hospital length of stay, and pharmacy consult recommendations.

Results:
Results will be presented at the 2019 Ohio Pharmacy Residency Conference.

Conclusions:
Conclusions will be presented at the 2019 Ohio Pharmacy Residency Conference.

Characterization and management of patients with immune-related adverse events during checkpoint inhibitor therapy

Shelby Moore, PharmD
Anli Francis, PharmD, BCOP

UAN:

Learning Objectives:

1. Describe immune-related adverse effects and review recommendations for toxicity management
2. Discuss possible predictors of immune-related adverse effects in oncology patients receiving immune checkpoint inhibitor therapy

Purpose:
Immune checkpoint inhibitors (ICIs) have revolutionized cancer treatment but are frequently associated with immune-related adverse effects (irAEs), which can affect any organ system. Recommendations for management of irAEs are provided by the American Society of Clinical Oncology and the National Comprehensive Cancer Network. Recommendations include holding offending agents and administering corticosteroids or other immunosuppressant agents. Extensive research has been performed to investigate predictors of efficacy with ICIs, but little is known regarding which patients are susceptible to toxicities. The primary objective of this study is to analyze potential risk factors for irAEs in oncology patients receiving ICI treatment. Additional objectives include evaluation of irAE management strategies and creation of a treatment protocol to optimize toxicity management within this health network.

Methods:
This study is a retrospective chart review of patients that have received treatment with ICIs during the period of January 1, 2015 through June 30, 2018. Information to be collected will include age, gender, cancer diagnosis, ICI agent and dosage used, concurrent medications, co-morbidities, number of previous lines of therapy, number of previous immune-related adverse effects, number of hospitalizations, and certain baseline lab values. Data analysis will be performed to identify potential correlation between risk factors and the incidence of toxicities. The change in toxicity grading after implementation of management strategies will also be reviewed. Based on successful management trends, an internal treatment protocol for irAES will be created.

Results:
Data collection and analysis are being conducted. Results will be presented at the Ohio Pharmacy Resident Conference.

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

Safety and efficacy of high-dose cefazolin therapy in obesity

Timothy Simpson, PharmD, PGY-1 Pharmacy Resident, Cleveland Clinic Marymount Hospital
Janet Wu, PharmD, BCIDP, Sneha Shah, PharmD, BCPS, Jason Pogue, PharmD, BCPS, BCIDP

UAN:

Learning Objectives:

1. Discuss the effects of obesity on pharmacokinetics implications for antimicrobials
2. Review current literature regarding cefazolin dosing in obesity

Purpose:
Current evidence demonstrates altered pharmacokinetics in obesity. However, optimal antimicrobial dosing strategies have not been established in this population. Although higher weight-based dosing of cefazolin is recommended in surgical prophylaxis, there is paucity of published literature to support higher treatment dosing. This study aims to establish whether high-dose cefazolin has similar safety and efficacy versus traditional-dose cefazolin in obese patients.

Methods:
This was a multi-center, retrospective, cohort study of obese adults receiving cefazolin for at least 48 hours and admitted to the Cleveland Clinic Health System between September 1, 2013 and August 31, 2018. Patients with creatinine clearance < 30 mL/min or cultures positive for methicillin resistant Staphylococcus aureus were excluded. Patients were matched 1:1 based on BMI, infection type and severity of illness. The primary objective was to compare the incidence of adverse effects between high- (2 g every 4-6 h) and traditional-dose (1 to 2 g every 8 h) cefazolin. Secondary objectives were to compare the rate of treatment failure, length of stay, mortality, and hospital readmission. Student's T test and chi squared tests were used to analyze continuous and categorical variables, respectively. Primary and secondary endpoints were analyzed using McNemar's test.

Results:
There were a total of 166 patients in each group. Of the baseline demographics, Charlson comorbidity index and age were significantly higher in the traditional-dose group. The incidence of adverse events were significantly higher in high-dose group (24.1% vs. 16.9%, p=0.0001, 95% CI 0.32 to 0.52). Treatment failure was encountered in 15.1% high-dose vs. 24.7% traditional-dose group patients, p=0.0001, 95% CI 0.31 to 0.51).

Conclusions:
Further analysis will be conducted to determine the differences in outcomes between the two dosing groups.

Evaluation of the Clinical Interpretation of the Anti-Platelet Factor 4 Assay (PF4 ELISA) in the Absence of Reported Optical Density Units

Alexandra Muma, PharmD - PGY1 Pharmacy Resident, Detroit Receiving Hospital
Raymond Yost, PharmD, Detroit Receiving Hospital; Joshua Raub, PharmD, BCPS, Detroit Receiving Hospital; Katherine Pinkey, BS, Detroit Receiving Hospital; Denise Sutter, PharmD, BCPS, Detroit Receiving Hospital

UAN:

Learning Objectives:

1. Describe the challenges associated with using the available clinical scoring tools and laboratory assays to diagnose HIT.
2. Interpret Anti-Platelet Factor 4 Assay (PF4-ELISA) results using a 4T score-stratified approach to predict a patient's probability of HIT.

Purpose:
Screening for heparin-induced thrombocytopenia (HIT) relies on clinical scoring tools such as the 4T score and the anti-platelet factor 4/heparin enzyme-linked immunosorbent assay (PF4 ELISA). At the study institution, PF4 ELISA results are reported as positive/negative in the electronic medical record. Current research suggests improved interpretation accuracy when implementing a 4T score-stratified approach to interpret PF4 ELISA results rather than a single cutoff value. The purpose of this study is to determine the incidence of "false-positive" diagnoses of HIT based on "positive" PF4 ELISA results despite optical density units which would have been more appropriately classified as "unlikely HIT."

Methods:
This study will be conducted as a retrospective cohort study of patients who were admitted to a multi-site hospital system between October 2012 and December 2018. Patients will be identified based on the presence of a PF4 ELISA result in the electronic medical record (EMR). Patients will be included if they are at least 18 years of age. Patients transferred from outside hospitals will be excluded if data in the EMR is insufficient to calculate a 4T score. Data to be collected includes baseline demographics, anticoagulant use and indication, incidence of major bleeding, PF4 ELISA result as optical density units, and serotonin release assay results. Data necessary to calculate a 4T score will also be collected including platelet count, duration of anticoagulation therapy, incidence of new-onset thromboembolism, and presence of other causes of thrombocytopenia.

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

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

A Population Health Management Approach to Improve Utilization of Direct Oral Anticoagulants (DOACs) in a Primary Care Population

E. Michael Murphy, PharmD
Virginia D. Mitchell, PharmD, BCPS, Kelli D. Barnes, PharmD, BCACP, Heather A. Johnson, PharmD, Neeraj H. Tayal, MD, Stuart J. Beatty, PharmD, BCACP

UAN:

Learning Objectives:

1. Relate indications and dosing for DOACs
2. Recall required laboratory monitoring for DOACs

Purpose:

Direct oral anticoagulants (DOACs) for the indication of long-term anticoagulation in nonvalvular atrial fibrillation and in venous thromboembolism (VTE) treatment and secondary prophylaxis are often recommended in guidelines for patients over other anticoagulants. DOACs do not require as frequent monitoring as vitamin K antagonists, however, their prescribing and monitoring require close attention to guidelines and primary literature. As the use of DOACs have increased, it remains unclear if their use meets these best practice recommendations. Inappropriate prescribing and lack of monitoring of DOACs may increase the risk for significant morbidity and mortality including stroke, VTE, and bleeding. The purpose of this study is to determine if a pharmacist-led population health management intervention can improve the appropriate prescribing and monitoring of DOACs.

Methods:

A retrospective chart review was conducted for patients with a primary care physician (PCP) within a general internal medicine (GIM) network at one academic medical center who were prescribed a DOAC between January 1, 2018 and June 30, 2018. Patients were included in one of four DOAC groups (i.e., apixaban, dabigatran, edoxaban, or rivaroxaban). Patients were excluded if their PCP was not a GIM physician, if they were not prescribed a DOAC for at least six months during the study period, if they had completed anticoagulation therapy, or if they were deceased. The following data was collected: patient demographics, height, weight, current problem list/diagnoses, PCP, DOAC, indication, dose, DOAC starting date, value and date of last: sCr, liver function tests, INR and hemoglobin. DOACs were reviewed for appropriate dosing, indication and safety, including adverse drug reactions, drug-drug interactions, and contraindications. When interventions were identified, recommendations for improved DOAC prescribing and monitoring were discussed with each PCP.

Results:

Data analysis is currently being completed. Results and conclusions plan to be presented at the 2019 Ohio Pharmacy Residency Conference.

Conclusions:

Risk Versus Benefit of Combined Aspirin and Warfarin Therapy in Patients with Atrial Fibrillation

Tara Nagaraj, PharmD- PGY-2 ambulatory care pharmacy resident, Ohio State Wexner Medical Center
Melissa J. Snider, PharmD, CLS, BCACP; Erica Davidson PharmD, CLS, BCACP; Raul Weiss, MD; Muhammad Afzal, MD

UAN:

Learning Objectives:

1. Review the background literature related to aspirin recommendations in anticoagulated patients
2. Discuss if risk exceeds benefit with aspirin use in anticoagulated atrial fibrillation patients

Purpose:
Patients with atrial fibrillation (AF) and indicated for anticoagulation often have comorbidities that may necessitate antiplatelet medication. However, studies have shown that patients may be on warfarin and aspirin without a clear aspirin indication. Current guidelines conflict in regards to aspirin use in anticoagulated AF patients who have stable coronary artery disease (CAD) or diabetes. The purpose of this study was to evaluate the incidence of major bleeding and thromboembolic events in patients with AF treated with warfarin alone versus combined warfarin and aspirin therapy in pharmacy-run clinic patients. The primary outcome was to compare incidence of bleeding and thromboembolic events between combined therapy and warfarin alone overall and between aspirin indications. Secondary outcome was to compare patient characteristics between groups.

Methods:
This was a retrospective, cohort study of patients of a pharmacist-run anticoagulation clinic with AF receiving anticoagulation between January 2013 and January 2014 observed over 5 years. The intervention group consisted of patients on warfarin and aspirin, whereas the control group, patients were on warfarin alone.

Results:
Research is in process

Conclusions:
Preliminary results reveal a trend towards higher event rate in bleeding and comparable thromboembolic rates.

Impact of Pharmacist Involvement in Heart Failure Transition of Care

Rachel Neu, PharmD, Ascension St. John Hospital
Christopher A. Giuliano, PharmD, MPH; Melvin A. Leonard, PharmD; Samantha J. Scalia, PharmD; Pramodini B Kale-Pradhan, PharmD, FCCP

UAN:

Learning Objectives:

1. Discuss the impact of a pharmacy-led discharge TOC program on the HF 30-day readmission rate at Ascension St. John Hospital.
2. Identify interventions made by pharmacists, students, and interns.
3. Describe the impact of the TOC program on HF core measures compliance rate.

Purpose:
A pharmacy-led heart failure (HF) transition of care (TOC) program was implemented at Ascension St. John Hospital in June 2017. This program, which involves pharmacists, residents, and students, focuses on the provision of patient education prior to discharge and completion of medication reconciliation for patients with HF on admission and before discharge. The purpose of this project is to evaluate the impact of pharmacy-led HF TOC program.

Methods:
This was a single-center quasi-experimental study using a pre-post design conducted at Ascension St. John Hospital. Patients were included if they were admitted to cardiology medical floors with a primary HF diagnosis between March 1st, 2016 to August 31st, 2018. Patients were excluded if they were admitted for a non-HF related diagnosis, admitted for 24 hours or less, had a stage IV cancer or dementia diagnosis, or were transferred to hospice care.

The primary outcome was HF 30-day readmission rate. Secondary outcomes included pharmacist interventions and Centers for Medicare & Medicaid Services (CMS) HF core measures compliance rate.

Data collection consisted of baseline demographics, left ventricular ejection fraction, admitting diagnosis, length of stay, discharge disposition, as well as number, reason, and location of 30-day readmission(s). The number and nature of pharmacy interventions in the post-implemented group were also collected.

The target sample size was 329 patients per group to detect an 8% absolute rate reduction with an alpha error rate of 0.05 and 80% power. Descriptive statistics will be used to characterize the study group. Differences between study groups will be assessed using the chi-squared test, Student's t-test, and analysis of variance. Multivariable analysis will be done using logistic regression. Kaplan-Meier and Cox proportional-hazards model will be used to analyze the time to readmission.

Results:
N/A (Research in-progress)

Conclusions:
N/A (Research in-progress)

Evaluation of mTOR inhibitor management in patients requiring surgery post liver transplant

Kristen Neuhaus, PharmD, Cleveland Clinic
Jamie Eckardt, PharmD, BCPS; Michael Spinner, MA, PharmD; Bijan Eghtesad, MD

UAN:

Learning Objectives:

1. Describe the place in therapy of mTOR inhibitors for use in solid organ transplant
2. Discuss concerns and potential complications associated with mTOR inhibitors

Purpose:
The mammalian target of rapamycin inhibitors (mTORi) are used for the prevention of allograft rejection in solid organ transplantation. mTORi, everolimus and sirolimus, are an alternative immunosuppressant in liver transplantation. They are associated with complications such as impaired wound healing, hepatic artery thrombosis, and lymphocele. Data is limited on mTORi management in patients undergoing surgical procedures. Our standard of practice for hernia repair is to hold mTORi therapy six weeks prior to and after surgery. Practice for other surgeries varies. Our goal is to evaluate the safety and efficacy surrounding the current practice of mTOR inhibitor management in post liver transplant recipients requiring surgery.

Methods:
This is a retrospective, descriptive study in post liver transplant patients undergoing a surgical procedure from January 1, 2013-December 1, 2018. Data was collected on all patients age ≥ 18 years old, liver transplant recipients, patients receiving immunosuppression with an mTORi, and that have underwent a surgical procedure. Patients were excluded that had a surgical procedure completed at an outside hospital or patients that received multi-organ transplants. Baseline characteristics, transplant history, mTORi characteristics, and surgical characteristics were collected.

Results:
Forty-three patients and a total of 118 surgical procedures were identified for inclusion. Five patients that had a minor surgery held mTORi a median of 14 days (12-24) prior to surgery. Twenty-seven patients that had a major surgery held mTORi a median of 42 days (26-47). In the remaining 86 patients that continued mTORi the median trough prior to surgery was 5.4 ng/mL (3.7-7.6). Twenty-one surgical complications were identified, 11 of these patients had a detectable mTORi trough and 2 patients had a trough not documented. Surgeon review attributed none of the surgical complications to use of mTORi.

Conclusions:
The use of mTOR inhibitors was not found to have an association with surgical complications. There is no need to discontinue mTOR inhibitor prior to surgery.

The impact of pharmacist-driven medication education classes on readmission rates for psychiatric patients

Dr. Karleigh Newmister, PharmD - PGY1 Resident at ProMedica Flower Hospital
Dr. Kristen Monarch-Mocek, PharmD and Megan Shulkosky, 2021 PharmD Candidate

UAN:

Learning Objectives:

1. Identify patient risk factors for psychiatric readmissions
2. Describe pharmacist interventions that can help to decrease readmission rates for patients with psychiatric illnesses

Purpose:
The psychiatric population is especially susceptible to readmission. To reduce readmissions, hospitals are working on effective transitions of care including pharmacist-provided medication education. Prior studies have shown that medication education and other pharmacists' interventions are effective for reducing psychiatric readmission. The objective of the study is to determine the effect of pharmacist-provided medication education on 30-day readmission for psychiatric cause.

Methods:
This study has been approved by the ProMedica Institutional Review Board. A single-center, quasi-experimental quality improvement project for ProMedica Hospitals was completed by a pharmacist who provided group medication education to adult patients admitted to the psychiatric unit. Patients who attended the group and were subsequently discharged home were included in the intervention. The control group consisted of similar patients who were admitted to the psychiatric unit during the same time frame one year prior. The control group data was collected through a retrospective chart review of the electronic medical record. The primary outcome was readmission for psychiatric cause within 30 days of discharge. Data collection included age, sex, race, diagnosis, length of stay, number of new medications, number of medication changes, and total number of medications at discharge. Data was analyzed using Fisher's exact and chi square tests for categorical data and independent t-tests for continuous data.

Results:
A total of 466 patients were included. The primary outcome of 30-day readmission was significantly reduced in patients who received pharmacist-led medication education compared to control (8% vs 15%; p=0.02). Readmitted patients were an average of 43.1 ± 12.2 years old while patients who were not readmitted averaged 36.6 ± 13.7 years of age (p=0.0004). Readmission was associated with a greater number of medications at discharge but was not statistically significant.

Conclusions:
Pharmacist-provided group medication education interventions significantly reduced the 30-day readmission rate to the psychiatric unit.

Impact of a resident led antimicrobial stewardship intervention on optimal management of community-acquired pneumonia

Divien Nguyen, PharmD- Pharmacy Residency, Detroit Medical Center Sinai-Grace Hospital
Aji Njie, M.D., Malitha Hettiarachchi, M.D., Jason Pogue Pharm.D., BCPS-ID

UAN:

Learning Objectives:

1. Assess impact of a resident-led antimicrobial stewardship intervention on the management of community-acquired pneumonia
2. Review recommendations on optimal management of community-acquired pneumonia

Purpose:
Inpatient management of community-acquired pneumonia (CAP) is variable due to limitations in diagnosis, suboptimal antimicrobial selection, and individual prescriber preferences for duration of therapy. A recent study revealed that an antimicrobial stewardship team consisting of an infectious diseases physician and pharmacist produced significant decreases in duration of CAP therapy and improvements in rates of de-escalation of antibiotic therapy and readmission. Since many institutions have limited resources, the objective of this study is to assess the impact of an antimicrobial stewardship team consisting of medical trainees on improving the management of CAP.

Methods:
This study is a retrospective quasi-experimental study of adult patients diagnosed with community acquired pneumonia admitted to Sinai-Grace Hospital, a university-based community teaching hospital. The pre-intervention group consists of patients with CAP managed from November 1, 2017 – March 30, 2018. These patients were managed by their primary care teams with no active intervention. Beginning in November 2018, an active stewardship intervention will be made to improve the management of CAP patients. These patients will be evaluated by a team consisting of both a pharmacy and chief medical resident for appropriateness of therapy and areas of optimization. The team will meet every Tuesday and Friday to assess CAP patients with respect to diagnosis, antibiotic selection, dose, and duration of therapy. The team will then verbally communicate recommendations to the primary team and document their recommendations for therapy in the electronic medical record. The intervention arm will be assessed from November 1, 2018 through March 30, 2019, and will be compared to those in the control arm. The primary outcome is duration of therapy for CAP. Secondary outcomes include duration of therapy in patients who did not meet diagnosis of CAP, 30 day readmission, and incidence of antibiotic related adverse events.

Results:
Data collection in progress.

Conclusions:
In progress.

Hemodynamic Adverse Effects of Dexmedetomidine and Propofol in a Critically Ill Trauma and Surgical Population: A Retrospective Cohort

Carli Nicholson, PharmD - PGY1 Pharmacy Resident, Cleveland Clinic Akron General
Chanda Mullen, PhD; Lawrence A. Frazee, PharmD, BCPS; Michaelia Cucci, PharmD, BCPS, BCCCP

UAN:

Learning Objectives:

1. Review the current recommendations for sedation in mechanically ventilated, critically ill patients.
2. Discuss the observed hemodynamic differences of dexmedetomidine and propofol.

Purpose:
Based on clinical practice guidelines, both dexmedetomidine and propofol are recommended for agitation in mechanically ventilated intensive care unit (ICU) patients. Direct comparisons between the two sedatives have been unable to demonstrate a significant difference in the incidence of hemodynamic adverse effects. However, the need for a therapeutic intervention for hemodynamic adverse effects appears to differ. The purpose of this study was to evaluate the incidence of hemodynamic adverse effects and rate of therapeutic interventions in critically ill trauma and surgical patients who received dexmedetomidine compared to propofol.

Methods:
This was a retrospective review of mechanically ventilated, critically ill trauma and surgical patients admitted from October 1, 2017 through October 31, 2018 who received dexmedetomidine or propofol. Exclusion criteria were as follows: sedated for a procedure or operation, history of heart block, permanent pacemaker, lack of intra-arterial blood pressure monitoring, received a bolus dose of the sedative, received both sedatives concomitantly for more than 24 hours, or status epilepticus. The primary outcome was the proportion of patients who required at least one therapeutic intervention for an adverse hemodynamic event within the first 24 hours of sedation.

Results:
A total of 800 charts were reviewed and 85 patients (dexmedetomidine [n=35] and propofol [n=50]) were included. No difference in the primary outcome was observed (17 [49%] vs. 27 [54%], p=0.624). There was no difference in the incidence of hemodynamic adverse events (18 [51%] vs. 30 [60%], p=0.433). Patients who received dexmedetomidine had a greater median decrease in heart rate compared to those who received propofol (23 bpm [IQR 16, 41] vs. 14 bpm [IQR 5, 24], p=0.002).

Conclusions:
The incidence of hemodynamic adverse events and rate of therapeutic interventions is similar in critically ill trauma and surgical patients who received dexmedetomidine compared to propofol.

Instituting pharmacist-driven procalcitonin monitoring at a community hospital

Vincent Notareschi, PharmD - PGY1 Pharmacy Resident, Southwest General
Rebecca Margevicius, PharmD, BCPS, BCIDP; Samantha Rasure, PharmD; Ashley Brown, PharmD, BCPS, BCPP

UAN:

Learning Objectives:

1. Describe the importance of procalcitonin monitoring and utilization.
2. Recognize the applications and limitations of procalcitonin laboratory values.

Purpose:

According to the Centers for Disease Control and Prevention, antibiotics are the most commonly prescribed class of medications in the United States and are considered the most significant culprit for inducing antimicrobial resistance. In addition, antimicrobial resistance has been recognized to increase patient morbidity, mortality, and healthcare costs. Procalcitonin (PCT) is well documented as a clinical tool to help reduce antibiotic exposure, costs, mortality, and 30-day readmission rates. Previously, PCT was underutilized at Southwest General. The goal of this study was to determine if instituting pharmacist-driven PCT monitoring would decrease antibiotic exposure and costs in patients with sepsis and lower respiratory tract infections in a community hospital with an established antimicrobial stewardship program.

Methods:

This study was classified as non-human research by University Hospitals' Institutional Review Board. Data for this prospective analysis was collected from November 1, 2018 to March 1, 2019 from patients with suspected or confirmed sepsis and lower respiratory tract infections admitted from the emergency department. Patients included in the analysis had a baseline PCT level measured within 24 hours of their initial dose of antibiotics. Subsequent PCT labs were ordered as needed to track the patients' progress. After PCT levels were gathered and results reviewed, pharmacists made recommendations to ordering physicians with the help of a PCT concentration monitoring chart. The primary outcome measured was length of antibiotic treatment in days.

Results:

Will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Will be presented at the Ohio Pharmacy Resident Conference.

Optimization of Sugammadex Use at St. Elizabeth Healthcare

Daniel S. Pardue, PharmD - St. Elizabeth Healthcare
Jaime Schwendenmann, PharmD; Brad Schmidt, PharmD; R.J. Frey, PharmD

UAN:

Learning Objectives:

1. Identify medications used for neuromuscular blockade and reversal
2. Discuss indications and dosing for sugammadex

Purpose:
The purpose of this project is to develop criteria for use of sugammadex (Bridion) to optimize its usage and expenditure at St. Elizabeth Healthcare. Sugammadex is a modified gamma cyclodextrin that can bind to aminosteroidal neuromuscular blocking agents (rocuronium or vecuronium) to reverse paralysis in adult patients undergoing surgery. Receiving FDA approval in December 2015, it has become a popular reversal agent due to its ability to quickly reverse neuromuscular blockade and lack of adverse effects.

Methods:
Appropriate use of sugammadex will be defined through evidence-based literature search of sugammadex and cost-effective treatment strategies for neuromuscular blocker reversal of rocuronium and vecuronium. Through a medication-use evaluation (MUE) the usage pattern of sugammadex at St. Elizabeth Healthcare will be identified through retrospective chart review of at least 100 randomized patients who received sugammadex from July to December 2018. Criteria for usage of sugammadex will be created according to best evidence-based practice and trends identified from the MUE. The criteria for use proposal will be presented at the Pharmacy and Therapeutics Committee for approval of implementation. Once approved, anesthesia team will be educated on criteria for use. Initial impact of criteria for use will be monitored through monthly sugammadex expenditure to evaluate cost savings post-implementation. Additional MUE may be created in the future if needed to reassess specific trends of usage.

Results:
Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:
Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Evaluation of pharmacist-directed interventions on meropenem usage and appropriateness at Mercy Health-Fairfield Hospital

Piper Parker, PharmD - PGY1 Resident, Mercy Health-Fairfield Hospital
Andrea Seeger, PharmD

UAN:

Learning Objectives:

1. Review Centers for Disease Control and Prevention (CDC) antibiotic resistant (AR) threats
2. Discuss the importance of antimicrobial stewardship
3. Identify the role of a pharmacist as it pertains to antimicrobial stewardship

Purpose:
Due to increased carbapenem use worldwide, there is an emergence of carbapenem resistance leading to a global public healthcare problem. Inappropriate prescribing of available antibiotics resulting in uncontrolled public access and/or subtherapeutic dosing, along with a lack of infection control measures, contributes to an increasing rate of resistance. The aim for this study is to determine whether the increase in meropenem use at Mercy Health-Fairfield Hospital is appropriate.

Methods:
A retrospective chart review was performed for all patients who received meropenem for community acquired pneumonia (CAP), health care associated pneumonia (HCAP), cellulitis or skin structure infections, urinary tract infections, bacteremia and/or sepsis. The study population includes all patients admitted to Mercy Health-Fairfield Hospital between January 1, 2017 and June 30, 2017 as well as January 1, 2018 and June 30, 2018. For each patient identified, a chart review was conducted to determine the duration of meropenem use, evaluate cultures and susceptibilities, identify if infectious diseases were consulted and whether pharmacists were involved in antibiotic management through the presence of pharmacist-entered iVent documentation. Appropriateness was determined using the 2010 Acute Uncomplicated Cystitis and Pyelonephritis in Women Infectious Diseases Society of America (IDSA) guidelines, 2011 American Academy of Family Physicians (AAFP) CAP guidelines, 2014 skin and soft tissue infections IDSA guidelines, 2016 HAP/VAP IDSA guidelines, 2018 Surviving Sepsis Campaign guidelines, culture results and susceptibilities, and a review of patient allergies.

Results:
During the study period of January 1, 2017 through June 30, 2017 and January 1, 2018 through June 30, 2018 there were a total of 340 meropenem orders included. Meropenem was appropriately prescribed 74.5% of the time.

Conclusions:
The three most commonly identified reasons for inappropriate use of meropenem were a duration of treatment exceeding guideline recommendations, drug-bug mismatch, and the lack of growth on cultures.

Evaluating the Effect of Alvimopan in Colorectal Surgical Procedures at a Large Academic Medical Center

Chandni Patel, PharmD- PGY1 Traditional Pharmacy Resident, Cleveland Clinic
Marcia Wyman, PharmD, BCPS; Marina Stepanski, PharmD; Sarah Welch, PharmD, BCCCP

UAN:

Learning Objectives:

1. To review ways to mitigate the risk of developing postoperative ileus (POI).
2. To evaluate the literature regarding the role of alvimopan in alleviating POI.

Purpose:
Over 330,000 patients undergo bowel resection in the United States each year with 5000 of those surgeries performed at the Cleveland Clinic. Following these procedures, patients may experience POI, which can result in an increased hospital length of stay (LOS). To mitigate POI, the enhanced recovery after surgery (ERAS) protocol was developed, which includes a variety of non-pharmacologic and pharmacologic interventions. Alvimopan (Entereg), a mu-opioid antagonist, was incorporated into the ERAS protocol to help accelerate time to gastrointestinal (GI) recovery. The goal of this study was to evaluate the efficacy of alvimopan in colorectal surgical procedures.

Methods:
This single-center, retrospective cohort study was conducted from February 2016 to December 2018. Patients were divided into groups based on pre and post use of alvimopan within the ERAS protocol. Adults (> 18 years) who had undergone an open or laparoscopic bowel procedure were included. Those with multiple colorectal surgeries performed during one encounter or who were ordered but not administered alvimopan were excluded. The primary outcome was time to GI recovery, and secondary outcomes were LOS and adherence to the recommended alvimopan dosing regimen.

Results:
Of the 290 patients included, 113 patients received alvimopan. On a univariate analysis, the median composite time to GI recovery was 1 day in both groups (p=0.25). More specifically, time to GI recovery component endpoints were assessed: the time to upper GI function was statistically significant (p

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

Retrospective, Enterprise-Wide Evaluation of Ketamine for Management of Acute Pain in the Emergency Department

Kaitlin Patterson, PharmD, PGY1 Clinical Pharmacy Resident, Cleveland Clinic Fairview Hospital
David Shifrin, PharmD, BCPS; Maria Kahle, PharmD, BCPS; Lu Wang M.S.

UAN:

Learning Objectives:

1. Define the role of ketamine for acute pain
2. Recognize the side effect profile associated with ketamine

Purpose:
Consensus guidelines on the use of intravenous ketamine for acute pain management were updated in 2018 to indicate the use of ketamine to treat acute pain. Use of subdissociative ketamine has been shown to treat pain as effectively as morphine leading to decreased prescribing of opioids. The purpose of this study was to evaluate the effectiveness of subdissociative ketamine for acute pain while also determining the incidence of rescue analgesia following ketamine administration and the side effects associated with ketamine.

Methods:
A retrospective, enterprise-wide chart review was conducted on patients that received ketamine for acute pain in 10 Cleveland Clinic Emergency Departments (ED) from May 9, 2017 to December 1, 2018. The efficacy of ketamine was analyzed using a paired t-test to assess the change of pain scores. Additional information including rescue analgesia and side effects was also analyzed.

Results:
115 patients were included in this study. There was no significant difference between groups in demographic and pre-treatment measures. The median dose of ketamine was 19.7 mg (15.9-24.1). After ketamine administration, pain scores decreased by an average of 4 points (p

Conclusions:
This study determined ketamine can reduce pain in patients presenting to an emergency department. The use of ketamine had minimal side effects and effect on vital signs. This agent can be used to effectively treat pain while limiting the use of opioids.

Formulary Stewardship Maintenance for Selected Medications at St. Elizabeth Healthcare

Betty K. Petrovich, PharmD - PGY1 Pharmacy Resident, St. Elizabeth Healthcare
Paul S. Sinclair, RPh; Andrew J. Steinmetz, PharmD

UAN:

Learning Objectives:

1. Define formulary management and its importance as it relates to patient outcomes.
2. Recognize St. Elizabeth Healthcare-specific appropriate criteria for use for alvimopan, bupivacaine liposome injectable suspension, intravenous (IV) acetaminophen, and rifaximin.

Purpose:

The United States Food and Drug Administration (FDA) set a record for new drug approvals in 2018 with 59 novel drugs and biologics approved by the agency's Center for Drug Evaluation and Research (CDER). With the rise in number and complexity of drug products and escalating drug prices, the formulary management process allows health care systems to objectively evaluate the efficacy, safety, and cost-effectiveness of medications. Through formulary stewardship maintenance, medications are more likely to be prescribed according to their approved criteria for use, ultimately reducing potential for patient harm and avoiding unnecessary costs. The focus of this cost management process is to assess adherence to approved criteria for use for alvimopan, bupivacaine liposome injectable suspension, intravenous (IV) acetaminophen, and rifaximin.

Methods:

The primary methodology of this study was a retrospective review of medication appropriateness of use per St. Elizabeth Healthcare guidelines involving alvimopan, bupivacaine liposome injectable suspension, IV acetaminophen, and rifaximin. Depending on the results of the retrospective review, a concurrent review of these medications was also conducted. These medications were previously assessed for appropriate usage, and new guidelines were implemented based upon findings. Initially, we reviewed whether target cost avoidance was met for each of the medications mentioned previously. If unmet, we proceeded with retrospective review of medication appropriateness. Each retrospective data collection reviewed five to 25 orders, based on prescribing frequency, weekly for five weeks, beginning 30 days post-guideline implementation. Based on these findings, additional tactics were employed as needed. Potential tactics include, but are not limited to, targeted education, order set modification, and order set creation.

Results:

Research in progress.

Conclusions:

Research in progress.

Adherence to the medication components of the surviving sepsis 3 and 6 hour resuscitation bundles

Marina Pittiglio, PharmD-Beaumont Hospital, Royal Oak
Jim Winegardner, PharmD, BCCCP, BCPS; Sheena J. Merwine, PharmD, BCPS; Rachael Fuller, PharmD

UAN:

Learning Objectives:

1. Define sepsis and identify or diagnose sepsis in patients
2. Discuss the management components of the surviving sepsis 3 and 6 hour resuscitation bundles
3. Assess areas for improvement with adherence to the surviving sepsis 3 and 6 hour resuscitation bundles

Purpose:

Sepsis is the body's response to active infection, which can lead to diminished blood flow, altered or impaired mental status, and multiple organ failure. Early goal directed therapy is currently recommended by the 2016 Surviving Sepsis Campaign guidelines for the management of sepsis. It has been shown that compliance with the 3 and 6 hour resuscitation management bundles leads to a decrease in in-hospital mortality, reduced length of stay and improved patient outcomes. The objectives of this study are to assess the adherence to the management components of the 3 and 6 hour Surviving Sepsis resuscitation bundles at our institution and evaluate potential areas for improvement.

Methods:

This study is a single-center retrospective chart review of patients with a primary diagnosis of sepsis from January 1, 2016 to September 31, 2018 conducted at Beaumont Hospital, Royal Oak. Patients were included if they were 18 years or older with a primary ICD-10 diagnosis of sepsis within the emergency department. Patients were excluded if they were transferred from a different institution and if they had a do not resuscitate (DNR) or hospice status at the time or within 6 hours of sepsis diagnosis. Data collected includes date of admission, date and time of diagnosis, baseline patient characteristics, hemodynamic parameters, baseline laboratory values, cultures obtained, and antibiotic administration. Characterization of patients that met sepsis or severe sepsis criteria and were adherent to the 3 and 6 hour sepsis management bundles will be reviewed.

Results:

Data analysis is currently in progress. Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Data analysis is currently in progress. Results will be presented at the Ohio Pharmacy Resident Conference.

Does Melatonin Decrease the Use of As-Needed Antipsychotics in Non-Critically Ill Hospitalized Patients?

Adina Poparad-Stezar, PharmD Pharmacy Practice Resident Ascension St. John
Shutian Ju, PharmD; Opal Bacon, PharmD, BCPS, BCPP; Diana Sigler, R.Ph.,CACP; Carly Burns, Renee Paxton, PharmD, BCPS, BCCCP, Christopher Giuliano, PharmD, MPH

UAN:

Learning Objectives:

1. Describe the proposed benefits of using melatonin to treat insomnia and prevent delirium
2. Discuss the risk factors for development of delirium in the inpatient setting

Purpose:
The purpose of this study is to evaluate the use of antipsychotics in patients receiving scheduled melatonin compared to patients receiving scheduled zolpidem or benzodiazepes(BZDs) for sleep while hospitalized on regular medical floors.

Methods:
This is a multi-center retrospective cohort study evaluating adult patients admitted to general floors who received at least three doses of either nightly melatonin, zolpidem, or BZD for sleep and had an active PRN order for antipsychotics between August 2012 and December 2018. Patients were excluded if they received scheduled antipsychotics and BZD prior to admission for conditions other than sleep, were treated for alcohol withdrawal, received study medications for less than 120 hours, or received concomitant melatonin and zolpidem or BZD for sleep. Patients diagnosed with dementia, suspected meningitis, encephalopathy, acute stroke/TIA/ICH, metastatic cancer, bipolar disorder, schizophrenia or schizoaffective disorder were also excluded.

The primary efficacy outcome compares the proportion of patients who received new breakthrough antipsychotics versus those who received nightly zolpidem or BZD for sleep. The secondary outcomes evaluate the association between dose of melatonin and total amount of antipsychotics received, and the proportion of patients who received breakthrough antipsychotics in each arm. The association of demographic and clinical variables with each dependent variable will be done using Student's t-test, the Mann-Whitney U test, analysis of variance, the Kruskal-Wallis test and chi-squared analysis as indicated by the data. Multiple logistic regression will be performed to model the dependent variables after controlling for any variables found to be significantly related on univariate analysis. A p-value of 0.05 or less will be considered to indicate statistical significance.

Results:
To be presented at the Ohio Pharmacy Residency Conference

Conclusions:
To be presented at the Ohio Pharmacy Residency Conference

Evaluation of an antimicrobial stewardship initiative on antimicrobial prescribing for intra-abdominal infections at a community hospital

Brandi Posten, PharmD, Cleveland Clinic Medina Hospital
Samantha Loutzenheiser, PharmD, BCPS; Andrea Pallotta, PharmD, BCPS, BCIDP, AAHIVP

UAN:

Learning Objectives:

1. Discuss stewardship interventions that can be utilized for intra-abdominal infections
2. Describe the pharmacist-impact in antimicrobial stewardship for intra-abdominal infections

Purpose:
Treatment options for intra-abdominal infections (IAIs) include a variety of antimicrobials including broad spectrum agents. To address inappropriate broad spectrum antimicrobial use, antimicrobial stewardship programs (ASP) have shown improved antibiotic utilization in management of IAIs. This study assessed the effectiveness of an ASP, including an empiric therapy guide and thrice weekly prospective audit and feedback, on empiric antibiotic prescribing for IAIs. Secondary outcomes compared duration of treatment and transition from intravenous to oral therapy.

Methods:
Adult patients admitted to Medina Hospital with mild-to-moderate community-acquired IAI from January 1, 2014 to September 1, 2015 (pre-group) or January 1, 2017 to September 1, 2018 (post-group) were included in this retrospective, quasi-experimental study. Exclusion criteria included: high-risk or hospital-acquired IAI, previous study enrollment, concurrent infection other than community acquired pneumonia, urinary tract infection or C. difficile infection. Concordant therapy was defined as selection of ceftriaxone/metronidazole or, for life threatening beta lactam allergies, ciprofloxacin/metronidazole.

Results:
Ninety-nine patients were included (50 pre-group, 49 post-group). Mean age, presence of a beta-lactam allergy, surgical interventions, and admitting service did not differ between groups. Diverticulitis was more common in the post-group (65.3%) than the pre-group (42%, p=0.02). Significant improvement in antibiotic selection was shown after ASP initiative (10% pre- versus 53.1% post-group, p

Conclusions:
An ASP initiative showed a significant improvement in empiric antibiotic selection for IAIs and highlighted opportunities to address duration of therapy with future ASP efforts.

Adherence to Pre-Treatment Dental Examinations and Documentation Practices in Oncology Patients Receiving Intravenous Bisphosphonates or Denosumab

Kelsey Quinion, PharmD, OhioHealth Riverside Methodist Hospital
Teresa Meier, PharmD, BCOP; Kara Ashley, PharmD, BCOP; Chelsea M. Bolyard, PhD; Anand Gupta, MBBS, MPH

UAN:

Learning Objectives:

1. Discuss the mechanism by which antiresorptive agents cause adverse effects and review indications for these agents in oncology patients
2. Describe current recommendations regarding dental care amongst oncology patient receiving treatment with intravenous antiresorptive agents

Purpose:

Antiresorptive agents including denosumab, pamidronate, and zoledronate are used in oncology patients to manage bone related complications associated with malignancy. Medication-related osteonecrosis of the jaw (MRONJ) is a rare, but serious adverse effect associated with the use of these agents. To reduce the risk of MRONJ, it is recommended that patients receive dental examination prior to and throughout therapy. Current institutional practices do not include a protocol ensuring reception or documentation of this dental care. As a result, oncology patients receiving antiresorptive therapy at OhioHealth may not be receiving recommended dental care, placing them at a higher risk for the development of MRONJ. The primary objective of this study is to assess whether oncology patients receiving intravenous therapy with bisphosphonates or denosumab received dental examination prior to initiating or throughout treatment. Additionally, this study will aim to identify documentation practices of this information within the electronic medical record, and describe barriers patients faced in accessing prophylactic dental care.

Methods:

This is an IRB-approved, retrospective and prospective, multi-center study comprised of a retrospective chart review and prospective scripted patient phone call. This study includes oncology patients who have received intravenous treatment with an antiresorptive agent at any of nine OhioHealth care sites between the dates of July 1, 2017 and July 31, 2018. The primary outcome of this study is to describe the frequency at which oncology patients receiving antiresorptive drugs received dental care before and/or throughout their therapy. Secondary endpoints include patient-reported barriers to accessing recommended dental care and documentation of this information within the electronic medical record. Patients less than 18 years of age, non-oncology patients, those receiving pamidronate, zoledronate, or denosumab for a non-oncology related indication, and hospice patients will be excluded.

Results:

During the study period, 13.8% of cancer patients received appropriate pre-treatment dental examination. 7.2% of patients had documentation regarding dental examination status. 61.3% of patients did not face any barriers when accessing dental care. The primary barrier patients faced in accessing dental care was cost.

Conclusions:

Oncology patients receiving antiresorptive agents are not receiving appropriate pre-treatment dental examinations. Adherence to dental examinations is rarely documented within the electronic medical record. Consistent patient education and follow-up may lead to increased adherence to recommended dental care.

Effects of a comprehensive medication management clinic on high-risk medication use in the elderly

Muzaina Ramzanali, PharmD
Alexander Hoffman

UAN:

Learning Objectives:

1. Determine the effectiveness of a pharmacist-driven comprehensive medication management clinic on the amount of high-risk medication use in a geriatric population
2. Compare the percentage of patients aged 65 years or older on a high-risk medicaition before and after the clinics intervention

Purpose:
High-risk medications increase adverse events and decrease quality of life of elderly patients, but they are still prescribed heavily. Use of these medications leads to hospitalization and increased morbidity and mortality. A retrospective cohort by Davidoff et al found that 43% of patients aged 65 years or older were prescribed at least one high-risk medication. Various tools, such as the Beers criteria, the Screening Tool to Alert Doctors to the Right Treatment (START), and the Screening Tool of Older Persons Potentially inappropriate medications (STOPP) have been used to assess high-risk medication use. Studies have shown that the use of comprehensive medication reviews in elderly patients at an outpatient clinic decreased the number of medication related problems and improved patient safety. Advanced practice models such as Comprehensive Primary Care Plus (CPC+) also track high-risk medication use in elderly patients as a marker of care quality. In an effort to improve performance on patient safety at a University Hospitals internal medicine clinic, geriatric patients were screened for high-risk medication use with the National Committee for Quality Assurance (NCQA) quality ID #238: Use of high-risk medications in the elderly. Patients taking one or more high-risk medications were offered comprehensive medication management services either in person or over the phone with the goal of reducing high-risk medication use.

Methods:
A non-interventional retrospective chart review performed on patients who received care in the high-risk medications comprehensive medication management clinic. The inclusion criteria were all patients who were screened using the NCQA metric age 65 years or older using at least one high-risk medication. A retrospective chart review will be performed by the pharmacy resident to determine the total number of patients still on a high-risk medication after the clinics intervention. The primary endpoint is to compare the percentage of patients aged 65 years or older on a high-risk medication after the intervention. The Secondary endpoint is to evaluate the effectiveness of in-person compared to phone call interventions.

Results:
Data collection and analysis are currently being conducted. Results will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:
A pharmacist-driven clinic can be beneficial to patients by providing extra care to improve health outcomes. Conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

The Impact of Pharmacy Driven Medication Histories in a Community Hospital Emergency Department

Ethan D. Rauch, PharmD - PGY1 Pharmacy Resident at ProMedica Flower Hospital
Malihe Sheikhi, PharmD and Kristen Monarch-Mocek, PharmD

UAN:

Learning Objectives:

1. Identify the most common medication history errors on a hospital admission medication history
2. Describe the effectiveness of pharmacy-driven medication reconciliation

Purpose:
The United States had 136 million emergency department visits in 2015. Of these patients, 18 million were admitted to the hospital. An estimated 67% of patients admitted to the hospital have medication reconciliation errors. Therefore, understanding and improving the process of medication reconciliation is necessary to provide the best possible patient care. This quality improvement project will investigate if a pharmacy driven medication history in a community hospital emergency department has an impact on prior to admission medication error rates.

Methods:
This prospective exploratory quality improvement project investigated pharmacist driven medication histories on adult patients admitted through a community hospital's emergency department. Patients were excluded if they were discharged home, not taking any medications prior to admission, refused care, recently admitted to a hospital, admitted for psychiatric concerns or if they were unable to communicate. The primary outcome was the percentage of patients with medication history errors. Secondary outcomes included the type of medication errors, the average number of medication errors per patient, and the percentage of medications with errors. Data was collected by chart review, interviewing patients and/or their care givers, community pharmacies, and the Ohio automated Rx reporting System. A medication administration record was also utilized if available from an outside institution.

Results:
A total of 107 patients were included in the analysis. A majority of patients were female with an average age of 69.7 years. The primary outcome resulted in 88% (margin of error 9%) of patients having a medication history error upon admission. The most common type of errors were identified as omission and commission.

Conclusions:
Medication history/reconciliation errors are common for patients upon hospital admission. Patient safety increases as these errors are discovered and corrected. Pharmacists are capable of identifying and resolving these medication history errors.

Improving pharmacy acuity scoring to optimize workflow and patient care

Charlie Reekers, PharmD - PGY1 Pharmacy Resident St. Elizabeth Healthcare
Katherine Moore, PharmD, BCCCP; Jillian Arrasmith, PharmD; Bryan Travis, PharmD; R.J. Frey, PharmD

UAN:

Learning Objectives:

1. Discuss the utility of work prioritization tools in overcoming barriers to patient care
2. Recognize patient-specific factors that warrant more immediate workup and intervention

Purpose:
As clinical pharmacists adapt to expanding roles and increased workloads, it becomes necessary to prioritize patients with the highest acuity and greatest potential for intervention. Prioritization tools, such as acuity scoring, have been developed within the electronic medical record to guide pharmacists to the most important clinical tasks, thus optimizing workflow, performance, and patient care. However, no standardized or validated scoring systems currently exist. The purposes of this study are to evaluate prioritization factors that reflect true patient acuity, incorporate these factors into the current acuity scoring system used at St. Elizabeth Healthcare, and examine changes in levels of utilization, pharmacist satisfaction, and correlation to actual patient acuity pre- and post-implementation.

Methods:
Face-to-face interviews and online surveys were first utilized to determine pharmacists' levels of utilization, methods of utilization, satisfaction, and recommendations for improvement of the current scoring system used at St. Elizabeth Healthcare. Feedback from pharmacists was combined with findings from primary literature review to create a new scoring system and criteria for high, medium, and low levels of patient acuity. The electronic medical record was used to analyze assigned acuity (based on the current scoring system) versus perceived acuity (based on predetermined criteria) for 100 randomly-selected medical, surgical, and transitional care unit patients and 50 randomly-selected intensive care unit patients. After implementation of the new scoring system, the assigned versus perceived data collection and online survey were repeated to measure the differences in system utilization, pharmacist satisfaction, and correlation of assigned score to actual patient acuity.

Results:
Research-in-progress. Results will be presented at the Ohio Pharmacy Resident Conference

Conclusions:
Research-in-progress. Conclusions will be presented at the Ohio Pharmacy Resident Conference

The effect of audit and feedback on procalcitonin use and duration of antibiotic therapy in patients hospitalized with suspected respiratory tract infections

L. Hunter Reese, PharmD MetroHealth Medical Center
Andrea H. Son, PharmD, BCPS, BCIDP, Nina Naeger Murphy, PharmD, BCPS AQ-ID, Michelle T. Hecker, MD

UAN:

Learning Objectives:

1. Describe the rationale for use of procalcitonin laboratory testing in patients with upper respiratory tract infections
2. List disease states which may lead to inappropriate procalcitonin interpretation

Purpose:
Procalcitonin (PCT) may be a useful biomarker to assist in the differentiation of bacterial versus viral etiology in respiratory tract infections and thus reduce unnecessary antibiotic use for nonbacterial infections. PCT testing has limitations. Certain disease states, such as non-bacterial aspiration pneumonitis and chronic kidney disease, are associated with elevated PCT levels. Modified use and interpretation of PCT testing in these disease states is required. Previous studies have noted relatively poor adherence to suggested algorithms for initiating and discontinuing antibiotic therapy based on PCT levels. Our primary objective is to determine if implementation of a PCT use guideline with audit and feedback would reduce antimicrobial days of therapy for patients with suspected respiratory infections.

Methods:
This is a quality improvement study including patients ≥ 18 years who were admitted to general medicine floors with suspected respiratory infection from November 5, 2018 through February 28, 2019. During this period, an education session on PCT use was provided to internal medicine providers. Patient census lists of four internal medicine teams were reviewed Monday through Friday by a pharmacist for inclusion criteria. The intervention group, consisting of providers on two of the four teams received recommendations about whether to order PCT, how to interpret PCT if ordered, and which, if any, antibiotic regimens to use for patients on their team meeting inclusion criteria. The other two internal medicine teams, the control group, did not receive this intervention, but were not excluded from other antimicrobial stewardship interventions unrelated to PCT. We sought to describe the antibiotic days of therapy/1000 patient days and PCT use in these two groups.

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

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

Improvement in medication reconciliation post-discharge HEDIS measure following implementation of a pharmacist-run service

Hannah Rhinehart, PharmD - PGY2 Ambulatory Care Resident, The Ohio State University Wexner Medical Center
Melissa Snider, PharmD, BCPS, CLS, BCACP; Amy James, PharmD, BCACP, BC-ADM; Laurence Blosser, MD

UAN:

Learning Objectives:

1. Identify the benefit of pharmacist involvement in the improvement of HEDIS measure in an ACO-like setting
2. Discuss the role for pharmacy in transitions of care after surgical discharge

Purpose:
Medication reconciliation post-discharge (MRP) completion rate is a HEDIS measure and reported as part of CMS Star Measures. For our physician-owned primary care medical group with ACO-like contracts, the measure is challenging, as patients discharged after surgery often see non-PCP specialists post-discharge, thus documentation is lacking for completion of MRP. Therefore, a pharmacist-led MRP service was implemented May 2018 with focus in this population. The purpose of this study is to evaluate the impact of a pharmacist-led post-surgical discharge medication reconciliation program in an ACO-like setting.

Methods:
A retrospective chart review was conducted utilizing a list of discharges from inpatient facility included in the MRP measure from four different payers in 2017 and 2018 for overall calendar year rates. The primary outcome was change in post-surgical MRP completion rate by usual care May – Dec 2017 as compared to May – Dec 2018, which was post-implementation of the pharmacy-led service. Secondary outcomes included: comparison of 30-day readmissions or ED visits for post-surgical patients during May – Dec evaluation periods, change in overall calendar year MRP completion rate, and description of pharmacist interventions in the pharmacy-led service.

Results:
1162 post-surgical discharges were included. There were 512 post-surgical discharges eligible for MRP in the 2017 usual care group and 648 in the 2018 group. In the 2018 group including the pharmacy-led service, there was a 41% increase in MRP completion rate (78.9% vs 55.86% in 2017 usual care) and a 9.8% relative risk reduction in 30-day readmission rates (6.17% versus 6.84% in 2017).

Conclusions:
Further results and data analysis will be presented at the Ohio Pharmacy Resident Conference.

The effect of antibiotic availability and time to administration on sepsis patients in the emergency department

Vanessa Rohm, PharmD, PGY-1 Pharmacy Resident, Aultman Hospital
Scott Perry, PharmD, BCPS, Aultman Hospital, Rebecca Prewett, PharmD, BCPS, Aultman Hospital, Thomas Bonsall, PharmD, BCPS, Aultman Hospital

UAN:

Learning Objectives:

1. Review the typical signs and symptoms of a patient presenting to the emergency department (ED) with sepsis
2. Discuss the importance of antibiotic administration in treating sepsis patients

Purpose:
The purpose of this study was to determine if there is a difference in time to antibiotic administration in sepsis patients who present to Aultman Hospital's ED when empiric antibiotics are readily available compared to being dispensed from main pharmacy.

Methods:
This is a retrospective, single-center chart review comparing time to antibiotic in septic patients who received piperacillin-tazobactam 3.375 grams IV before and after stocking the product in the ED medication room. Patients were included if they presented to the ED between August and September 2018 and had suspected infection, received piperacillin-tazobactam IV, and had sepsis documented in the chart or met specific sepsis defining criteria (2 or more Systemic Inflammatory Response Syndrome (SIRS) criteria and one organ dysfunction). The primary outcome was time to antibiotic administration from time of order. Secondary outcomes included time to antibiotic administration from either time of triage in the ED or time of medication removal from automated dispensing cabinets. Continuous data was evaluated with the Mann-Whitney U test. Statistical significance was established at p

Results:
83 patients met inclusion criteria for sepsis with 33 receiving the 3.375 gram dose of piperacillin-tazobactam. Of the 33 patients assessed, 14 were treated prior to piperacillin-tazobactam being stocked in the ED medication room. A median time to antibiotic administration from time of order in the before versus after stocking piperacillin-tazobactam groups was 150 minutes and 177 minutes respectively (p=0.382). The median time of time to antibiotic from triage in the before and after stocking piperacillin-tazobactam groups was 48 and 70 minutes respectively (p=0.316).

Conclusions:
The time to antibiotic administration in sepsis patients when piperacillin-tazobactam was stocked in the ED versus sent from the pharmacy was similar, therefore additional investigation may be necessary to determine the cause of administration delay.

Evaluation of Dispensing Practices of Insulin Lispro (Humalog®) in the Inpatient Treatment of Hyperglycemia

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UAN:

Learning Objectives:

1. Discuss the impact of imposing standardized dispensing practices of insulin lispro (Humalog®) on pharmacist order verification and resulting patient safety and cost effectiveness on a medical unit.
2. Discuss and compare alternative strategies other institutions utilize in dispense preparation of insulin within the institutionalized setting.

Purpose:
Insulin therapy has been a cornerstone to prioritized treatment of hyperglycemia in hospitalized diabetic patient populations. This therapy may consist of basal once or twice daily dosing alone, or combined with prandial insulin. The use of sliding scale insulin as a single regimen in patients with diabetes is not acceptable and may result in hypoglycemia, unmanaged hyperglycemia and an increased risk of hospital complications. Mercy Health – Lorain Hospital currently uses a standard protocol of dispensing patient specific prandial insulin vials with auxiliary labeling to patients that need additional therapy to basal insulin. While having immediate access to prandial insulin at all times is important for patient outcomes, not all patients receive prandial insulin ordered on admission. This results in an excess waste of medication that the patient never receives. The purpose of this study is to evaluate a standardized practice to dispense insulin lispro (Humalog®) for all patients that are properly identified to receive therapy.

Methods:
A retrospective chart review was conducted to identify patients diagnosed with prior diabetes and treated with insulin lispro (Humalog®) at Mercy Health – Lorain Hospital from March 2019 through April 2019. Data collected includes gender, age, documented A1C, glucose on order entry, documented insulin administration during admission, hyperglycemia, hypoglycemia, and subsequent glucose readings on admission. Reported hyperglycemia and hypoglycemia were assessed through review of physician and nursing notes. All of the data was analyzed and compared between the control and treatment groups to evaluate efficacy, safety, and cost effectiveness of therapy standardization. For the treatment arm, a policy was implemented where only patients with recorded acute hyperglycemia via point of care (POC) testing above 180 mg/dL would receive prandial insulin dispensed on initial order verification by a pharmacist. Administration with POC glucose >180 mg/dL would help reduce events of hypoglycemia by preventing patients with lower glucose levels from obtaining prandial insulin. In addition, patients that get transferred or never receive prandial insulin on admission will not have vials dispensed in their names which may result in a reduction of pharmaceutical expense.

Results:
Final results and conclusions to be presented at the Ohio Pharmacy Resident Conference.

Conclusions:
Final results and conclusions to be presented at the Ohio Pharmacy Resident Conference.

Major Bleed Rates Following Systemic vs. Catheter-Directed Alteplase for Pulmonary Embolism

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UAN:

Learning Objectives:

1. Summarize the classification and current treatment options of acute pulmonary embolism (PE)
2. Describe previous studies that evaluated bleed rates associated with systemic and catheter-directed alteplase administration for PE treatment

Purpose:

Pulmonary embolism (PE) may be classified as low-risk, submassive or massive and pharmacologic treatment options include anticoagulation or thrombolytics. Systemic thrombolytic therapy may improve hemodynamic parameters and reverse right ventricular (RV) dilation and dysfunction, but is associated with major bleeding events and intracranial hemorrhage. Catheter-directed therapy has the potential to produce fewer adverse effects, as a lower dose is being administered. Currently, there are limited studies evaluating systemic versus catheter-directed thrombolytic therapy, and existing data is limited by variability in dosing, administration route and thrombolytic agent. The objective of this study was to compare major bleed rates associated with catheter-directed therapy versus systemic alteplase in patients with pulmonary embolism.

Methods:

This retrospective chart review included adult patients with a suspected or confirmed PE who received alteplase therapy for PE treatment between November 1st, 2012 and July 31st, 2018. Patients were excluded if they received alteplase for an indication other than PE or received alteplase during cardiac arrest for a suspected PE. The primary outcome was major bleeding within 7 days of alteplase administration. Secondary outcomes included minor/clinically relevant bleeding within 7 days, repeat thrombolytic therapy within 7 days, intensive care unit (ICU), total in hospital, and in-hospital following alteplase administration length of stay (LOS), and 30 day recurrent venous thromboembolism and death.

Results:

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

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference.

Implementation of a rolling cycle of patient evaluation and education sessions focused on diabetes-related comorbidities in a pharmacist-run ambulatory care clinic

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UAN:

Learning Objectives:

1. Identify important standards of care for individuals with diabetes outside of target hemoglobin A1c values.
2. Recognize ways in which pharmacists can help meet standards of care set forth by the American Diabetes Association.

Purpose:
Diabetes is a prevalent disease in the United States associated with significant morbidity, mortality, and healthcare expenditures. In addition to meeting glycemic targets, the American Diabetes Association also recommends assessment and treatment of various comorbidities related to diabetes, including hypertension, dyslipidemia, atherosclerotic cardiovascular disease, kidney disease, retinopathy, neuropathy, smoking, and immunizations. The objective of this study is to determine if incorporating focused evaluation and educational sessions targeting various diabetic comorbidities and complications into regular patient visits increases the number of diabetes patients who meet current standards of care in a pharmacist-run chronic disease state management clinic.

Methods:
All active patients with a referral to the diabetes clinic will be enrolled in this single-center pilot study. Patients seen for a diabetes management visit will be given an evaluation and educational session as part of their regularly scheduled appointment. The patients will cycle through a total of four different themed sessions as follows: Cardiovascular I, Cardiovascular II, Microvascular, and Preventative. The Cardiovascular I session will focus on cardiovascular disease risk and antihyperlipidemics. Next, the Cardiovascular II session will focus on antihypertensives and antiplatelets. The third session, Microvascular, will focus on nephropathy, retinopathy, and neuropathy. Lastly, the Preventative session will focus on immunizations and smoking status. Pharmacist follow-up actions will include initiating or modifying therapy under a collaborative practice agreement, communicating recommendations to physicians, ordering labs, performing physical assessment, administering immunizations, and providing smoking cessation resources.

Results:
At the end of the five-month study period, pre-study compliance rates to standards of care will be compared to post-study compliance rates.

Conclusions:
Data collection is currently ongoing and final results and conclusions will be presented at the 2019 Ohio Pharmacy Residency Conference.

Transitioning pharmacy interns from technical staff to pharmacy extenders in an urban community based academic medical center

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Michael Hoying, Rph, MS; Chanda Mullen, PhD

UAN:

Learning Objectives:

1. Discuss PAI initiatives related to pharmacy students
2. Understand how pharmacy interns can be used as pharmacist extenders
3. Analyze the impact of changing the intern model at Cleveland Clinic Akron General

Purpose:
Cleveland Clinic Akron General's (CCAG) pharmacy has a goal of completing admission and discharge medication reconciliation for all high readmission risk patients. These activities in combination with a discharge summary completed within 48 hours of discharge and scheduling a PCP follow up appointment, are components of a "Core 4" that has demonstrated decreases in hospital readmissions and increased patient satisfaction. CCAG has historically completed its medication reconciliations through clinical specialists and residents. Meeting this objective has proven challenging with the current model. The engagement of pharmacy interns will increase resources and provide support during hours that often encounter staffing challenges related to this goal.

Methods:
A single-center, quality improvement initiative. Third and fourth professional year interns were positioned to patient care activities while first and second year interns focused on central pharmacy distribution and sterile compounding. Data related to the number of covered activities completed and percentage of high-risk patients receiving admission and discharge medication reconciliation were collected between September 2018 and February 2019 and compared with the 6-month period before initiation of the project.

Results:
696 high-risk discharges were completed during the study period with 582 (83.7%) receiving admission reconciliation, 623 (89.6%) receiving discharge reconciliation and 519 (74.2%) receiving both admission and discharge reconciliation. The pharmacy interns completed 287 (49.3%) of the admission reconciliations and 89 (14.3%) of the discharge reconciliations. The 6-month period prior to initiation had 679 patients discharged with 559 (82.5%) receiving admission reconciliation, 594 (87.5%) receiving discharge reconciliation and 493 (72.6%) receiving both admission and discharge reconciliation. There was an increase of 1.2% for admission reconciliation, 2.1% for discharge, and 1.6% for both.

Conclusions:
The repositioning of pharmacy interns towards patient care has demonstrated a benefit in terms of work completed by the interns and learning opportunities provided. The benefits were not without unforeseen challenges. Future plans will include more defined expectations in terms of productivity metrics and additional observations and coaching utilizing a standardized tool. This project proved beneficial for the department of pharmacy and intern development, however a substantial increase in the percentage of patients receiving the measured pharmacy services was not demonstrated.

Evaluation of the Efficacy of Individual and Combined Therapies for Treating Hyperkalemia in the Emergency Department

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Raymond J. Yost, PharmD, Detroit Receiving Hospital Rachel E.S. Wein, PharmD, BCPS, Detroit Receiving Hospital Mark H. Pangrazzi, PharmD, BCCCP, Sinai-Grace Hospital Elizabeth A. Petrovitch, PharmD, BCPS, Harper University Hospital

UAN:

Learning Objectives:

1. Review the pathophysiology of hyperkalemia
2. Describe the pharmacology and differences between hyperkalemia treatment agents

Purpose:
Hyperkalemia is a common and potentially lethal electrolyte disorder in patients presenting to the emergency department, however there is a lack of universally accepted guidelines and randomized controlled trials evaluating the efficacy of different treatment modalities. The purpose of this study is to assess the efficacy of individual and combined pharmacological agents, as well as hemodialysis, on reducing serum potassium levels in patients with hyperkalemia.

Methods:
This retrospective cohort study will identify patients from November 1st-November 30th 2018, ages 18-89 years old, presenting to four separate Detroit Medical Emergency Departments within 4 hours of ED admission presenting with a potassium level of >5.5 mmol/L . This initial potassium level will be denoted as the index event. Treatments will be recorded for up to 4 hours after initial potassium is drawn, and repeat potassium levels will be recorded up to 8 hours after the index potassium level. Patients will be excluded if they do not have repeat potassium levels, treatments are not recorded within 4 hours, or if a sample is hemolyzed. After the initial index event, the type, dose and time of medication(s) administered and total dialysis duration will be recorded. Following hyperkalemia treatment, a final K result will be determined. From there, a backwards, stepwise, logistic regression analysis will be performed to determine the magnitude of change from the initial serum K level of 5.5 mmol/L and correlation of the treatment modalities on the change in serum K levels

Results:
To be presented at the Ohio Pharmacy Residency Conference

Conclusions:
To be presented at the Ohio Pharmacy Residency Conference

Implementation and Evaluation of a Direct Oral Anticoagulant (DOAC) Management Service in the Anticoagulation Clinic

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UAN:

Learning Objectives:

1. Identify considerations regarding DOAC therapy selection and monitoring in the geriatric population
2. Discuss the feasibility of implementing a pharmacist run DOAC management service

Purpose:
The introduction of direct oral anticoagulants (DOACs) has lead to an increasing number of patients receiving anticoagulation. DOACs are often perceived as more convenient compared to warfarin, due to reduced monitoring needs and drug interactions. However, new challenges exist with their management, warranting ongoing monitoring. There is limited data available that examines DOAC management models. The objectives of this study are to evaluate the operational feasibility, categorize pharmacist interventions, and assess satisfaction regarding implementation of a DOAC management service within an established, pharmacist-led anticoagulation clinic at a Geriatric Center of Excellence.

Methods:
This is a single center, retrospective study conducted post-DOAC management service implementation. Adult patients who had been enrolled in the service for at least 3 months were eligible for inclusion. The electronic medical record was used to collect demographics, past medical history, prescribed medication, fill history, number of DOAC service visits, medication discrepancies, adverse effects, bleeding and thromboembolic events, baseline and follow-up laboratory parameters, and type of drug interactions. Additionally, pharmacist time to complete each visit and associated tasks was recorded. Physicians within the clinic and eligible patients were sent validated satisfaction surveys. Their responses were de-identified by a third-party, non-clinic staff member to maintain patient confidentiality. The data will be analyzed using descriptive statistics.

Results:
Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:
It is hypothesized that the implementation of a pharmacist-led DOAC management service will improve adherence, monitoring, and appropriateness of DOAC therapy in our population while not disrupting the clinic workflow. Patients will have more contact with providers regarding their anticoagulation therapy, which should increase patient education and satisfaction with their care.

Effects of Educational Interventions on Appropriate Prophylactic Antibiotics for Prevention of Surgical Site Infections

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Suzanne Marques, PharmD, BCPS, BCCCP; Laura Schulz, RPh, BCPS

UAN:

Learning Objectives:

1. Describe current guideline recommendations for pre-operation antibiotics and risks associated with improper use
2. Identify patient populations who require dose/therapy adjustments for pre-operation antibiotics
3. Evaluate impact of pharmacist driven interventions on pre-operation antibiotic prescribing

Purpose:
Surgical site infections are a leading cause of surgical complications. Most often, these infections are related to improper selection, dose, and/or timing of prophylactic antibiotics prior to incision. Other factors include the surgeon's technique, the environment, the sterility of equipment, pre-operation preparation, and patient comorbidities. The primary objective is to increase compliance with appropriate selection, dosing, timing, and re-dosing of antibiotics after educational interventions. The secondary outcome will look at the rate of surgical site infections.

Methods:
This study was reviewed and approved by the local institutional review board. Three interventions were implemented to improve compliance to current guideline recommendations for prophylactic antibiotics. The first intervention reviewed order sets of the targeted surgeries and update them to be congruent with current guidelines. The second intervention provided education to all personnel involved in surgery verbally and through handouts regarding correct selection, dosing, timing, and re-dosing if necessary. The final intervention implemented a pharmacy review of selection/dose of pre-operation antibiotics for patients who are more complex. Implementation of these interventions took place in November 2018, and patient charts were retrospectively reviewed for compliance to guidelines between December 2017 and February 2018 (pre-implementation) and December 2018 to February 2019 (post-implementation).

Results:
Data collection and analysis are currently in process. Results will be presented at Ohio Pharmacy Resident Conference in May 2019.

Conclusions:
N/A (research in progress)

Evaluation of meropenem use at a community teaching hospital

Curtis Scheiderer, PharmD
Eve Hackett-Garr, PharmD, BCPS; Kathryn Carlson, PharmD, MS, BCCCP; Carly Mckenzie, PharmD, BCPS

UAN:

Learning Objectives:

1. Define the role of antimicrobial stewardship and its potential effect on emerging drug resistance
2. Identify opportunities to optimize meropenem prescribing at a community teaching hospital

Purpose:

Antimicrobial stewardship programs aim to improve antimicrobial prescribing through optimizing therapy, and reducing adverse events, ultimately leading to better outcomes. The emergence of multi-drug resistant bacteria has become an increasingly prevalent problem throughout the world. Further complicating the problem, patient-reported penicillin allergies often hinder the use of more efficacious and narrow-spectrum antibiotics. Studies have shown that greater than 90% of these self-reported penicillin-allergic patients can tolerate a penicillin or cephalosporin, yet often a carbapenem is used due to allergy and not necessarily indication. Decreasing unnecessary carbapenem use in this population is a potential stewardship opportunity. The purpose of this study is to describe the use of meropenem at a community teaching hospital.

Methods:

A single-center retrospective chart review will be conducted on all patients ordered meropenem during hospital admission over a one-year period between October 1, 2017 and October 1, 2018. The primary objective of this study is to describe the use of meropenem at a community teaching hospital. The secondary objective is to quantify the number of meropenem opportunity days for patients with a documented penicillin allergy. Opportunity days will be defined as days of meropenem therapy when alternative agents could have been utilized. The following data will be collected: preadmission living status, inpatient level of care, infectious disease consultation, penicillin allergy and reaction, previously tolerated beta-lactams, history of MDR organisms, indication, and meropenem days of therapy. This data will then be analyzed to identify areas for improvement in the prescribing of meropenem and provide evidence for further antimicrobial stewardship programs including the institution of a formal penicillin allergy screening process.

Results:

Will be presented at the Ohio Pharmacy Resident Conference

Conclusions:

Will be presented at the Ohio Pharmacy Resident Conference

Impact of multidisciplinary education on appropriate in-hospital treatment of asymptomatic bacteriuria

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Jessica Walles, PharmD, BCPS, BCIDP, St. Rita's Medical Center

UAN:

Learning Objectives:

1. Describe candidates who may be appropriate for treatment of bacteriuria
2. Discuss effectiveness of pharmacist-delivered education on asymptomatic bacteriuria and appropriate treatment

Purpose:

Asymptomatic bacteriuria is a condition that is often inappropriately treated. The Infectious Diseases Society of America guidelines only recommend screening for and treating asymptomatic bacteriuria in certain patient populations. It has been estimated that 30 to 60 percent of patients who do not meet criteria for treatment are prescribed antibiotics. This increases antimicrobial resistance, expense, length of stay and adverse drug reactions. Knowledge gaps and cognitive biases have been shown to be the main drivers of unnecessary antibiotic use. The purpose of this study is to reduce the number of patients inappropriately treated for asymptomatic bacteriuria through multidisciplinary education.

Methods:

Patients admitted with at least one positive urine culture were reviewed to determine if antibiotic treatment was appropriate, length of therapy, if there was a pharmacist intervention, and if a urine culture or urinalysis with reflex was ordered. Treatment was considered appropriate if the patient met any of the following criteria: signs or symptoms of urinary tract infection, pregnancy, upcoming urologic procedure, transurethral resection of the prostate (TURP) planned or if bacteriuria persisted for greater than 48 hours post-catheter removal. Education was provided to physicians, nurses, and pharmacists in November 2018 on appropriate ordering of urine samples and asymptomatic bacteriuria treatment, if indicated. Staff completed a survey pre-implementation and again after the study period to assess effectiveness of education and retention. Data collected pre-implementation from December 2017 to February 2018 was compared to the data post-implementation from December 2018 to February 2019 to determine if the number of patients inappropriately treated for asymptomatic bacteriuria had been reduced

Results:

Data analysis is currently being conducted; results will be presented at the 2019 Ohio Pharmacy Resident Conference.

Conclusions:

N/A

Assessment of venous thromboembolism (VTE) prophylaxis strategies in underweight patients

Michaela Scott, PharmD- Detroit Medical Center
Karim Mouabbi, PharmD, Dina Maskoki, PharmD Candidate, Raymond Yost, PharmD, Ayman Soubani, MD, Krista A. Wahby, PharmD, BCCCP

UAN:

Learning Objectives:

1. Describe American College of Cardiology guideline recommendation for VTE prophylaxis in underweight patients
2. Describe the safety of different heparin dosing regimens for VTE prophylaxis in underweight patients

Purpose:
Venous thromboembolism (VTE) is the most common preventable cause of hospital-related mortality. The American College of Cardiology recommends VTE prophylaxis with low molecular weight heparin, subcutaneous heparin (UFH) 5,000 units or fondaparinux. However, the most appropriate drug and dosing strategy is uncertain, especially in patients of extreme body weight. The purpose of this study is to evaluate prescribing patterns of UFH 5,000 for VTE prophylaxis and the incidence of bleeding events and altered coagulation studies.

Methods:
This was a retrospective cohort that included patients admitted for at least 72 hours to an academic medical center between January 1, 2016 and December 31, 2016 that received at least one dose of subcutaneous UFH 5,000 units for VTE prophylaxis. Descriptive statistics were used to for prescribing patterns for VTE prophylaxis. A Cox proportional analysis was used to compare the incidence of major bleed between dosing regimens.

Results:
There were a total of 460 underweight patients, of which, 442 were prescribed UFH 5,000 units every 8 hours and 30 patients were prescribed UFH 5,000 units every 12 hours. There were 12 patients who were prescribed both regimens during their admission. There were 66 patients that had a major bleed either on presentation or during their admission. Out of the 66 major bleeds, 25 major bleeds occurred after 48 hours of receiving UFH 5,000 units. Out of 460 patients, 46 had an elevated aPTT. Patients with a major bleed had a longer duration of UFH 5,000 units 129+132 vs. 250+171 hours, p

Conclusions:
In underweight patients, UFH 5,000 units every 8 hours for VTE prophylaxis is associated with an increased risk of major bleed.

Evaluating the Effectiveness of a Consultant Pharmacist Directed Protocol to Reduce Adverse Patient Outcomes Associated with Chronic Obstructive Pulmonary Disease (COPD) Therapy within Long-Term Care Facilities

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Bethanne Brown, PharmD, BCACP, TTS; Patricia Wigle, PharmD, BCPS, BCACP; Josh Postolski, PharmD

UAN:

Learning Objectives:

1. Review 2019 GOLD Guidelines for COPD management
2. Describe the need for pharmacist intervention in long-term care facility patients with COPD diagnosis
3. Discuss a consultant pharmacist directed patient care protocol for optimizing COPD medication therapy in long-term care facilities

Purpose:

Chronic lower respiratory diseases, including COPD, are the third leading cause of death in the United States, despite being preventable and treatable diseases. Geriatric COPD patients present additional challenges including difficult or incorrect diagnoses, inappropriate medication use, and an increased number of comorbidities. In the last 12 months of a COPD patient's life, there is a 40% likelihood of them being admitted to a long-term care (LTC) facility. Consultant pharmacists are trained to address the pharmacotherapeutic challenges of elderly patients. Our study aims to evaluate the impact of a consultant pharmacist directed COPD management protocol in reducing adverse patient outcomes.

Methods:

In this prospective study, a consultant pharmacist directed care protocol has been developed and implemented for optimizing medication therapy of COPD patients at a LTC facility. It involves discussion with providers regarding appropriate documented diagnosis of COPD based on COPD exacerbation history, and risk assessment using the CAT score and the mMRC Dyspnea Scale. Patient charts are reviewed for medication appropriateness based on 2019 COPD GOLD Guidelines. Use of respiratory therapy for wheezing/shortness of breath, oxygen use, and smoking habits are also documented. The primary outcomes analyzed will be rates of hospital readmissions and COPD exacerbations related to primary diagnosis of COPD. The data before and after implementation of the protocol will be compared to assess effectiveness of the protocol.

Results:

Data collection is in progress.

Conclusions:

At present, no studies have been completed focusing on the consultant pharmacist's role in COPD management in the LTC patient population; yet facilities will be penalized for COPD hospital readmissions. Evaluating the effectiveness of this protocol may help demonstrate the importance of a pharmacist's role in the management of patients with COPD, leading to improved patient outcomes.

The Impact of Ketamine on Opioid Requirements for Analgesia in Trauma Patients

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Chanda Mullen, PhD; Jacob Zimmerman, PharmD, BCCCP; William Leukhardt, MD; Nathan Hieb, MD; Andrea Williams, PharmD, BCPS, BCCCP

UAN:

Learning Objectives:

1. Review dosing recommendations for ketamine for analgesia.
2. Identify the effect of ketamine on opioid requirements for trauma patients.

Purpose:
With the current opioid epidemic, healthcare providers are seeking ways to reduce opioid use in the emergency department setting. Ketamine is becoming a commonly utilized non-opioid alternative for analgesia in acute care settings. Previously published literature has shown a clear, short-term, opioid sparing effect when ketamine is used in sub-anesthetic doses as a perioperative adjunct; however, evidence for the use of ketamine in acute trauma patients is unclear as these patients are not often included in the literature.

Methods:
This was a retrospective cohort of patients from October 2017 through August 2018 admitted to the trauma service. The primary objective was to determine if ketamine has an opioid sparing effect in trauma patients who received ketamine in addition to opioids versus patients who received only opioids for analgesia within 3 hours of hospital arrival. Secondary objective was to evaluate the incidence of adverse reactions between groups, cumulative dose of opioids needed within 6 hours of hospital arrival, and change in pain scale after 3 hours of hospital arrival.

Results:
A total of 48 patients were included in the study; distributed equally between groups. There was no statistically significant difference found for the primary outcome of cumulative dose of opioids needed within 3 hours of hospital arrival for patients who received ketamine in addition to opioids versus patients who received only opioids (median 24 MME vs. 15 MME; p=0.876) nor the secondary outcome within 6 hours (37 MME vs. 23 MME, p=0.388). There were no adverse reactions reported. The change in pain scale was not significantly different between groups.

Conclusions:
Literature evaluating the use of ketamine for analgesia has shown mixed results. This study found the cumulative dose of opioid required in trauma patients is similar when comparing opioids only to ketamine with opioids.

Impact of continuous glucose monitoring shared medical appointments on diabetes self-efficacy and hemoglobin A1c

Ana Simonyan, PharmD, Cleveland Clinic
Sanela Lekic, PharmD, BCACP, Cleveland Clinic; Diana Isaacs, PharmD, BC-ADM, CDE, Cleveland Clinic

UAN:

Learning Objectives:

1. Explain the benefits of continuous glucose monitors compared to traditional self-monitored blood glucose.
2. Discuss clinical outcomes related to use of continuous glucose monitoring shared medical appointments.

Purpose:
The purpose of this study is to evaluate the impact of continuous glucose monitoring (CGM) shared medical appointments (SMA). The primary objective is to evaluate the change in diabetes self-efficacy through an 8 question Likert-scale survey before and after the CGM SMA. Secondary objectives are change in A1c, change in diabetes medications, and summative responses of planned lifestyle changes.

Methods:
This study is a retrospective, single-center, observational study of patients attending CGM SMA between June 2017-August 2018. Participants age >18 who attended the full CGM SMA were included. Participants with less than 3 days of CGM data were excluded. Data collected includes baseline characteristics, CGM data, A1c, and medication regimen. Descriptive statistics as well as paired t-test were utilized as appropriate. Qualitative analyses were performed for survey responses.

Results:
A total of 171 patients met inclusion criteria. The mean baseline A1c was 8.64 + 1.99% and the mean pre-test score was 51.70 + 15.79 out of a possible 80 points. A statistically significant increase in diabetes self-efficacy score by a mean of 12.9 + 12.7 (P

Conclusions:
The CGM SMA is a novel practice model incorporating diabetes education, CGM, and interprofessional care that demonstrated improvements in diabetes self-efficacy and reduction in A1C.

Evaluating the efficacy and safety of a heparin nomogram in cardiovascular surgery patients at a pediatric institution

Kennedi Smith, PharmD, Children's Hospital of Michigan
Paulina Reizian, PharmD, Heidi Sartori, PharmD

UAN:

Learning Objectives:

1. Review the risk factors that put pediatric cardiovascular surgery patients at an increased risk for thrombosis.
2. Describe the monitoring parameters used to assess the safety of anticoagulation with heparin.

Purpose:
Pediatric patients with cardiovascular (CV) disease and recent cardiac surgery are at high risk for hemodynamic changes. Management of heparin in pediatrics after CV surgery poses challenges in balancing adequate anticoagulation without the adverse events of bleeding and thrombosis. Currently, no formal guidelines are published for this patient population. The CV surgery service at Children's Hospital of Michigan implemented a revised therapeutic heparin infusion nomogram to standardize management in these patients. The objective of this study was to evaluate the efficacy and safety of this nomogram.

Methods:
This was a single-center retrospective study that evaluated patients admitted to the CV surgery service from December 2016 through September 2018 who received a therapeutic heparin infusion. The primary outcome was mean time to first therapeutic activated partial thromboplastin time (aPTT). Secondary outcomes included mean percentages of first aPTT values below, within, and above target range after first therapeutic aPTT attained and mean heparin rate at first therapeutic aPTT value. Safety outcomes evaluated the incidence of bleeding and thrombosis, as well as the incidence of heparin-induced thrombocytopenia (HIT).

Results:
A total of 16 patients met inclusion criteria for data analysis. Mean time to therapeutic aPTT was 41 ± 28.1 hours. Mean percentages of first aPTT values below, within, and above target range after first therapeutic aPTT attained were 47%, 33%, and 20%, respectively. The mean heparin rate at first therapeutic aPTT was 24.3 ± 7.8 units/kg/hour. There were no reported incidences of major or minor bleeding, thrombosis or HIT.

Conclusions:
The CV surgery heparin nomogram provides effective anticoagulation with a low incidence of adverse events. Due to a low sample size, continued evaluation of the nomogram is needed to monitor efficacy and safety.

The impact of hyperchloremia on renal and intensive care unit outcomes in the traumatic brain injury population

Samantha Spetz, PharmD - ProMedica Toledo Hospital/Toledo Children's Hospital
Anthony Jaworski, PharmD, BCCCP Michael A. Rudoni, PharmD, BCPS, BCCCP

UAN:

Learning Objectives:

1. Describe the incidence of traumatic brain injuries and explain the role of hypertonic saline in treatment.
2. Evaluate the potential complications of elevated serum chloride levels during treatment with hypertonic saline.

Purpose:
The purpose of this study was to evaluate the incidence of acute kidney injury (AKI) in relation to serum chloride levels in patients with traumatic brain injuries (TBIs) receiving continuous hypertonic saline infusions for intracranial pressure management.

Methods:
A retrospective cohort study was performed between November 2016 and November 2018. Patients ≥16 years presenting with TBIs who received HTS for at least 12 hours were eligible. Patients were divided into two cohorts: those who developed hyperchloremia on HTS and those who did not. The primary outcome was the incidence of AKI. Secondary outcomes included in-hospital mortality, intensive care unit (ICU) and hospital length of stay (LOS), the need for renal replacement therapy, and resolution of serum creatinine to baseline in patients who developed AKI.

Results:
This study included 27 patients, with 24 developing hyperchloremia. AKI occurred in 7 patients, all of which were hyperchloremic. In-hospital mortality occurred in 8 patients (29.6%). Of these, all were hyperchloremic and 4 (50.0%) developed AKI. There were no statistically significant differences between the groups in hospital or ICU LOS. No patient required hemodialysis due to AKI, and one patient who developed AKI had resolution of serum creatinine back to baseline. The multiple linear regression analysis indicated a significant association between peak serum chloride levels during HTS and those with severe TBIs. A positive association between TBI severity and AKI development was also discovered.

Conclusions:
Our study failed to show a significant association between hyperchloremia and the incidence of AKI in TBI patients receiving 3% HTS as a continuous infusion. However, an association of AKI development in patients presenting with a severe TBI was observed. Further research examining a larger patient population is necessary to thoroughly explore the association between TBI severity, hyperchloremia, and the incidence of AKI in this patient population.

Evaluation of Pharmacy Technician Involvement in Clinical Service Delivery within a Grocery-Based Community Pharmacy

Brooke Taylor, PharmD- The Ohio State University College of Pharmacy
Bella Mehta, PharmD, FAPhA; Erin Blank, PharmD; Lindsay Tsai, PharmD

UAN:

Learning Objectives:

1. Recognize the need for increased pharmacy technician involvement in clinical service delivery.
2. Describe a focus group research study to potentially increase pharmacy technician involvement in clinical service delivery.

Purpose:

Due to the expanding roles of pharmacists and pharmacy technicians, there is increased need for involvement by technicians to aide in the completion of clinical services, such as identifying patients eligible for medication therapy management (MTM), conducting prework for comprehensive medication reviews (CMR) and billing for clinical services. Within one division of a grocery-based community pharmacy chain, technicians are stratified based on level of experience, with advanced levels having expanded roles in clinical service delivery. To advance to higher levels, technicians must complete additional training including computer-based training (beginner/ intermediate level), reading a manual (advanced level) and passing an examination (all levels). Additionally, technicians who are eligible to become advanced may take an in-person training course before taking the examination (84% completion rate). Even with these training programs and 508 advanced level technicians, technician involvement in this division remains inconsistent across locations. The aim of this study is to assess pharmacist and pharmacy technician perceptions of knowledge and comfort regarding the technician's role in clinical service delivery as well as to identify essential content areas and gaps in current training offered within a grocery-store chain pharmacy.

Methods:

This prospective, descriptive research study will be submitted for IRB approval and then implemented during the first two quarters of 2019. In spring of 2019, stores with higher than average rates of technician involvement in clinical service delivery and stores with lower than average rates of technician involvement in clinical service delivery will be identified based on individual performance metrics (IPM). Up to two focus groups of pharmacists from these stores will be asked how they successfully incorporate technicians into clinical service delivery workflow and motivate technicians. To assess perceptions of knowledge and comfort regarding the technician's role in clinical service delivery as well as to identify essential content areas and gaps in current training offered, up to six additional focus groups of pharmacy technicians will be created. Technicians with a higher than average clinical opportunity completion rate and technicians with a below average completion of clinical opportunities will be identified based on IPM. Both focus groups will be asked questions on involvement in clinical service delivery, opinions on the usefulness of, applicability, and gaps in the current training process, barriers to consistent involvement in clinical service delivery and improvements they feel should be made to training. Once essential content areas and gaps in current training offered are identified, appropriate interventions will be developed to address these issues.

Results:

Research in progress. Results will be analyzed using descriptive statistics and inferential statistics as appropriate.

Conclusions:

The results of this study could be used to provide insight on how to overcome barriers to pharmacy technician involvement in clinical service delivery and the type of training that should be provided to pharmacy technicians.

Impact of Provider Accepted Pharmacist-Initiated Interventions on A1c Outcomes in Underserved Populations Disproportionately Affected By Diabetes

Jessica Thomson, PharmD, MBA
Lydia Bailey PharmD; Russell Curington, PharmD, BC-ADM; Bethanne Brown, PharmD, BCACP; Mohammed Alsultan, PharmD; Mike Espel, RPh

UAN:

Learning Objectives:

1. Identify various diabetes management interventions made by pharmacists using OutcomesMTM in an effort to reduce a patient's hemoglobin A1c (A1c) value.
2. Discuss unique barriers to diabetes control identified in an underserved patient population disproportionately affected by diabetes.

Purpose:
While literature clearly supports a pharmacist's role in diabetes care, the generalizability to a population disproportionately made up of patients with diabetes cannot be made. Studies analyzing the relationship between prescriber acceptance or denial of pharmacist recommendations and change in hemoglobin A1c (A1c) are needed. In addition, adherence to medications impacts changes in A1c values. Few studies examine adherence as it relates to changes in laboratory values and ultimately patient outcomes. The goal of this study is to determine factors with the greatest influence on change in A1c in an underserved population disproportionately affected by diabetes.

Methods:
A chart review was completed using data from OutcomesMTM and QS1 dispensing software from April 1, 2015 to June 30, 2018. Data collected included patient name, gender, reason and result of recommendation, result date, diabetes-related medications, and A1c values. OutcomesMTM data was analyzed to identify a relationship between physician accepted interventions and change in A1c from baseline, as well as determine statistical significance between recommendations that were accepted versus rejected. Prescription pick-up dates were used to calculate average medication possession ratio (MPR), with a score of ≥ 80% considered adherent, and to determine statistical significance in change in A1c between patients who were adherent versus non-adherent.

Results:
There was statistical significance in reduction from baseline A1c for patients whose physicians accepted pharmacists' recommendations versus rejected recommendations ($p=0.037$). There was no correlation found between physician-accepted interventions and change in A1c ($R2=0.0039$, $p=0.9488$) and no statistical difference in change from baseline A1c in patients who were adherent versus non-adherent to their diabetes medication regimen ($p=0.7228$).

Conclusions:
This study identified that acceptance of pharmacists' recommendations by physicians can have a great influence on decreasing A1c values. Further research should be conducted to detect if other confounding variables have a greater impact on decreasing A1c values.

Clinical outcomes with extended versus intermittent infusion of cefepime, piperacillin/tazobactam, and meropenem in patients with Gram-negative bacteremia

Kieu-Nhi Tran, PharmD*
Jason Pogue, PharmD, BCPS-AQ ID; Ryan Mynatt, PharmD, BCPS-AQ ID; Keith Kaye, MD, MPH

UAN:

Learning Objectives:

1. Discuss the rationale and evidence for prolonged infusion of beta-lactam antibiotics
2. Identify research gaps in current literature for prolonged infusion of beta-lactam antibiotics

Purpose:
The increase in multi-drug resistant pathogens has prompted the need for different strategies to enhance existing antibiotics. Such strategies include pharmacodynamically optimized dosing of beta-lactams via extended infusion. Available clinical data on this practice are conflicting and limited by the sole focus being on target populations such as patients in the intensive care unit or pathogens with high minimum inhibitory concentrations. Additionally, these studies fail to assess outcomes other than clinical cure or mortality which could be of clinical importance. The objective of this study is to assess outcomes in patients receiving extended versus intermittent infusion beta-lactams for Gram-negative bacteremia.

Methods:
A retrospective matched cohort study of adult patients at the Detroit Medical Center who received cefepime, piperacillin/tazobactam, or meropenem via intermittent (30 minute) or extended (3 hour) infusion for Gram-negative bacteremia from 2010 - 2018 will be performed. Patients will be included if they received a target antimicrobial within 24 hours of bacteremia onset and continue that agent for at least 48 hours. Patients will be excluded if they meet any of the following criteria: polymicrobial infection with either Gram-positive or fungal pathogens, receipt of more than 48 hours of combination therapy against the isolated pathogen, or receipt of both extended and intermittent infusion for the index infection. Extended infusion patients will be matched to intermittent infusion patients 1:1 based on sepsis severity, intensive care unit status at onset of bacteremia, source of bacteremia, and causative pathogen. Data collection will include demographics, comorbidities, relevant laboratory values, severity of illness, and microbiologic and treatment data. The primary outcome will be the time until clinical stabilization defined as the presence of hemodynamic stability and the resolution of fever and leukocytosis. Secondary outcomes include the difference in clinical cure, mortality, length of stay, subsequent isolation of resistant organisms.

Results:
In progress

Conclusions:
In progress

Impact of procalcitonin guiding antibiotic management in chronic obstructive pulmonary disease exacerbation and community acquired pneumonia

Molly Triner, PharmD, PGY-1 Pharmacy Resident, Mercy Medical Center
Sunita Patel, PharmD, BCPS; Rachael Craft, PharmD, BCIDP; Aarthi Rajkumar, M.D., F.A.C.P.; Tejas Patel, M.D

UAN:

Learning Objectives:

1. Define the role of procalcitonin in the de-escalation of antibiotics for patients with community acquired pneumonia and acute chronic obstructive pulmonary disease exacerbations
2. Identify the appropriate patient population for use of procalcitonin in antimicrobial

Purpose:

Chronic obstructive pulmonary disease (COPD) exacerbation and community-acquired pneumonia (CAP) are major drivers of antibiotic overuse, primarily due to challenges in pathogen identification. Procalcitonin, the prohormone of calcitonin, is released in response to bacterial infection, but not in viral infections or other inflammatory conditions. The purpose of this study is to determine if the use of a procalcitonin guided algorithm in patients diagnosed with COPD exacerbation and/or CAP can reduce antibiotic exposure without negatively impacting clinical outcomes. The primary outcome is days of antibiotic therapy. Secondary outcomes will include all-cause hospital readmission within 30 days of discharge, respiratory related hospital readmission within 30 days of discharge, 30-day mortality, hospital length of stay, and adverse events to antibiotics.

Methods:

This study was approved by the institutional review board. It was conducted at Mercy Medical Center in two phases, and involved patients admitted to the general medical teaching service. The first phase was prospective during the months of September 2018 through January 2019. Physicians utilized a procalcitonin guided algorithm for determination of initiation and duration of antibiotic use in patients admitted with a primary diagnosis of COPD exacerbation and/or CAP. Data from these patients was collected and compared to a retrospective cohort prior to procalcitonin implementation. The patient data for the retrospective cohort was collected from the months of September 2017 through January 2018. Inclusion criteria were patients 18 years of age or older admitted under the general medical teaching service, primary diagnosis of COPD exacerbation and/or CAP, and a procalcitonin ordered within 24 hours of admission (prospective group).

Results:

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

Conclusions:

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

Development of a clinical risk scoring tool for predicting extended spectrum beta-lactamase infections

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Ryan P Mynatt, PharmD, BCPS-AQID, Detroit Receiving Hospital Jason Pogue, PharmD, BCPS-AQID, Sinai Grace Hospital
Raymond Yost, PharmD, Detroit Receiving Hospital

UAN:

Learning Objectives:

1. Describe risk factors that are associated with ESBL infections
2. Review initial antibiotic selection in patients with suspected ESBL infections

Purpose:
The purpose of this study is to derive a scoring tool to identify patients who are at an increased risk of having extended spectrum beta-lactamase (ESBL)-producing infections, and to help guide clinicians' empiric antibiotic selection.

Methods:
This analysis will be conducted as a retrospective cohort study of patients who were admitted to emergency departments between July 1, 2017 and June 30, 2018 at a multi-site hospital system. The study will assess risk factors associated with ESBL-producing infections upon admission to the hospital. Participants will include patients who are greater than or equal to 18 years of age, and had both antibiotics given and cultures taken within 24 hours before or after admit orders. An initial data analysis will be conducted via the pharmacy system to identify patients who meet inclusion criteria, have relevant culture results, and infection related International Classification of Disease (ICD)-10 codes. Validation for accuracy of infection in the patient population will conducted before additional data is collected. Further information that will be collected includes baseline demographics, admit and discharge disposition, Elixhauser comorbidity score and Charlson comorbidity index, history of ESBL-producing infections, antibiotic exposure, prior surgery, and prior use of foreign materials. A predictive scoring tool will be derived from identified risk factors and will be evaluated using receiver operator characteristic curves (ROC AUC) at various breakpoints.

Results:
Data collection is in process.

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

Impact of antihistamine administration on morphine milligram equivalent requirements utilized for the treatment of sickle cell disease associated vaso-occlusive crisis

Christopher Tweed, PharmD, PGY-1 Pharmacy Resident, Cleveland Clinic Akron General
Jessica Emshoff, PharmD, Chanda Mullen, PhD, Ronda Ambroziak, PharmD, John Petrus, MD

UAN:

Learning Objectives:

1. Review current guidelines and primary literature pertaining to the utilization of analgesics during vaso-occlusive crises (VOC).
2. Discuss the complications associated with appropriate opioid-based pain management during VOC.
3. Understand the potential correlation between diphenhydramine administration and patient outcomes.

Purpose:
Sickle cell disease (SCD) is a form of anemia that affects nearly 100,000 Americans. The most common manifestation of SCD experienced is painful and unpredictable vaso-occlusive crises (VOC). Because of aggressive opioid-based therapy, diphenhydramine is often added for the treatment of opioid-induced pruritus. It has been proposed that due to its potentially desirable side effects, the administration of diphenhydramine during vaso-occlusive crisis may impact pain management requirements.

Methods:
This was a multicenter, retrospective chart review conducted on patients at least 18 years of age, diagnosed with sickle cell disease, and admitted for inpatient treatment of vaso-occlusive pain crisis for at least 24 hours. Patients were excluded for inpatient stays of less than 24 hours, experienced a > 24 hours lapse between sequential opioid doses, or received patient controlled analgesia (PCA) for pain management. Patients were categorized in to two groups: those who did not receive concurrent diphenhydramine and those who did. The primary objective of this study was to determine the potential relationship between administration of diphenhydramine and average daily oral morphine milligram equivalents (MME). Secondary outcomes included comparison of length of stay and average patient reported pain scores.

Results:
For the primary outcome of this study, a statistically significant difference was determined in average MME between the diphenhydramine and control group; 257.2 and 95.7, respectively (p

Conclusions:
The addition of diphenhydramine yielded significantly higher MME requirements, length of stay, and patient-reported pain scores. While the reasons for diphenhydramine administration are difficult to categorize, there seems to be a correlation between diphenhydramine administration and undesirable patient outcomes in the population studied.

Creation, Implementation, and Evaluation of Pharmacist-led Medicare Part D Open Enrollment Events

Bridget Vendittelli, Pharm.D
Janna Fett, Pharm.D., BCACP, Kaylin Braekevelt, Pharm.D., Jennifer Priziola, Pharm.D., MBA, BCPS, Elena Kline, Pharm.D., BCGP, BCACP

UAN:

Learning Objectives:

1. Describe the importance for Medicare patients to re-evaluate Medicare Part D plan options annually
2. Outline the process of implementing a Medicare Part D Open-Enrollment service in a hospital-based outpatient clinic setting

Purpose:
Medicare is a federal health insurance program for patients aged 65 years and older, or for those meeting certain criteria, including disability, end-stage renal disease, and amyotrophic lateral sclerosis. Prescription coverage can be obtained through either Medicare Part D or Medicare Advantage plans. Each plan varies in cost based on monthly premium, annual deductible, copayment, and drug formulary. The purpose of this study is to assess the impact of pharmacist-led Medicare Part D open enrollment events on the annual out-of-pocket costs and patient satisfaction in a hospital-based outpatient clinic setting.

Methods:
This prospective pilot study, consisting of eight pharmacist-led open-enrollment events, was conducted at two Beaumont ambulatory clinics. Pharmacists and volunteers were trained through the Michigan Medicare/Medicaid Assistance Program to assist eligible patients in reviewing plan options. Patients were included if they were eligible for or had existing Medicare coverage, and desired assistance in reviewing available plan options. Patients were excluded if they were unable to attend plan review sessions. Data collection included a pre-appointment intake form to determine the patient's main concern regarding prescription coverage, followed by the outcomes of the appointment. Additional data collected included patient demographics, clinical characteristics, potential cost savings, total time of appointment and the post-appointment survey which assessed patient satisfaction.

Results:
Forty-eight patients were screened; 39 patients were assisted in Medicare Part D plan optimization. The average appointment time was 55 minutes (30-150 min). Of the included patients, 33 (85%) patients experienced a total annual potential cost savings of $135,363, and 5 patients were referred for further financial assistance. Twenty-eight out of 35 patients who returned post-appointment surveys stated they would return next year.

Conclusions:
Pharmacist-led Medicare Part D open-enrollment services can significantly reduce estimated annual out-of-pocket costs and result in patient satisfaction with the service.

Personalized antimicrobial stewardship in the management of hospitalized patients with pneumonia

Brooke Vonada, PharmD
Kellie Buschor, PharmD, BCPS, BCCCP Fadi Safi, MD Kelli Cole, PharmD, BCPS, BCIDP

UAN:

Learning Objectives:

1. Describe the impact pneumonia and inappropriate prescribing of antibiotics has on patients and the healthcare system.
2. Identify the benefits a trained pharmacist on the rounding service can add to managing patients admitted with pneumonia.

Purpose:
Antimicrobial stewardship intervention has been shown to improve appropriate prescribing for patients hospitalized with pneumonia without negatively affecting clinical outcomes. There is limited data, however, evaluating the most effective method of providing this intervention. The purpose of this study is to compare rates of antimicrobial de-escalation between patients managed by a dedicated clinical pharmacist and those without a dedicated clinical pharmacist.

Methods:
service with a primary or secondary diagnosis of pneumonia and treated with > 48 hours of systemic antibiotics between [x date]-[y date]. Patients were excluded if they were completing a previously prescribed course of antimicrobials, were immunosuppressed, or had a pre-existing pulmonary condition. The primary outcome of rate of de-escalation at day 4 of therapy was compared between services with a dedicated clinical pharmacist and services without. Secondary outcomes included duration of therapy, hospital and ICU length-of-stay, 30-day readmission and Clostridium difficile infection, as well as in-hospital and 30-day all-cause mortality.

Results:
Preliminary results displayed, 88 of 745 patients have been included. There was a significant difference between groups for prevalence if CNS disease (p=0.05). No statistical significance was seen between groups for clinically evaluable pneumonia (p=0.087), percent IV antibiotics at day 4 (p=0.56), or rate of antibiotic de-escalation (p=0.80). Data collection still in progress and updated results will be presented at OPRC.

Conclusions:
Our hypothesis is that by having a clinical pharmacist contributing to the care of patients admitted for pneumonia, inappropriate and misused antibiotics will be reduced.

Time to Antibiotic Administration in Patients Presenting with Chemotherapy-Induced Febrile Neutropenia at Summa Health System Emergency Departments

Allyn M Walkama, PharmD
Kathleen M Robinson, RPh, BCOP; Jacqueline R Ewald, PharmD, BCPS; Paula A Politis, PharmD, BCPS

UAN:

Learning Objectives:

1. Define febrile neutropenia
2. Identify the recommended time to antibiotic administration in patients that present with febrile neutropenia (FN) to the emergency department (ED)

Purpose:
Febrile neutropenia (FN) occurs frequently in cancer patients receiving chemotherapy and can be life threatening. FN occurs when a patient develops an oral temperature of ≥ 38.3 ◦C or a temperature of ≥ 38.0 ◦C for at least one hour, and has an absolute neutrophil count (ANC)

Methods:
Medical charts were retrospectively reviewed from June 2017 - June 2018 utilizing the institution's electronic medical record. Information was collected on time to administration of antibiotics, including key intervals throughout the ordering, dispensing, and administration process in order to identify which step in the process allowed the greatest opportunity for improvement. The TTAA was defined as the time from lab result confirming neutropenia to antibiotic administration.

Results:
Of the 96 patient charts reviewed, 41 met the criteria for inclusion. Median TTAA from lab result was 1.1 hours (IQR 0.5 - 4.4), and TTAA from arrival was 3.4 hours (IQR 2.4 – 6.6). More recent literature suggests that antibiotics should be administered within 60 minutes of triage in patients with suspected FN. Of the 41 patient charts reviewed, antibiotics were administered within 60 minutes of triage in zero patients.

Conclusions:
Possible interventions to reduce the TTAA include providing patients FN alert cards to present at the ED, ensuring timely delivery of medications from the pharmacy, and initiating a protocol to empirically treat patients that present with suspected FN.

Evaluation of three months of once – weekly rifapentine and isoniazid for latent tuberculosis infection

Ramara Walker, PharmD - PGY-1 Pharmacy Resident, Cleveland Clinic Main Campus
Pavithra Srinivas, PharmD, BCPS, AAHIVP, Stephanie Bass, PharmD, BCPS, BCCCP, Cyndee Miranda, MD, Leia Johnson, MD, Andrea Pallotta, PharmD, BCPS, BCIDP, AAHIVP

UAN:

Learning Objectives:

1. Review the standard of care and newly recommended treatment regimens for latent tuberculosis infection (LTBI)
2. Discuss the study results regarding therapy completion rates and incidence of adverse effects

Purpose:
Twelve weeks of once-weekly isoniazid and rifapentine (3HP) is as effective as nine months of daily isoniazid (9H), the standard of care for latent tuberculosis infection (LTBI). 3HP has been associated with increased incidence of adverse effects (ADRs) compared to 9H. This study evaluates the safety and completion rates of 3HP for LTBI in a real-world setting.

Methods:
This single-center, retrospective cohort and nested case-control study, comparing patients experiencing ADRs compared to those who did not, enrolled patients 18 years and older receiving 3HP from Cleveland Clinic Main Campus from October 2011 through July 2018. The primary objective evaluated 3HP completion rates and incidence of adverse effects. Secondary objectives evaluated time to 3HP induced ADRs, assessed the rate of discontinuation due to ADRs, compared 3HP completion rates and ADRs between directly observed therapy (DOT) and self-administered therapy (SAT), and identified risk factors associated with ADRs.

Results:
Of 200 patients screened, 144 patients met eligibility criteria. Median age was 40 years, 52.8% of participants were men, and 74.3% received LTBI testing for occupational health screening. 3HP was completed by 119/144 patients (82.6%) with similar completion rates amongst DOT and SAT groups (82.9% vs 81.8%, p=0.89). During treatment, 92/144 (63.9%) patients experienced any ADR with the most prevalent ADR being flu-like symptoms (38.2%). Similar rates of ADRs were observed between DOT and SAT groups (64.0% vs 63.6%, p=0.97). Median time to 3HP-induced ADRs occurred during week 2 [2-5, IQR]. Results indicate that 13/144 (9.0%) patients discontinued treatment due to ADRs. After adjusting for other factors associated with ADRs at baseline, SAT was not associated with increased ADRs.

Conclusions:
3HP completion rates amongst DOT and SAT groups were high and comparable to previous findings in literature. Overall incidence of ADRs in this study was high, but ADRs were mostly mild.

Methadone Use for Neonatal Abstinence Syndrome in a Level III Newborn Intensive Care Unit

Laura Walsh, PharmD, Mercy Health St. Vincent Medical Center*
Kathryn Kleckner, PharmD, Deidre Rohaley, PharmD, MBA, BCPS

UAN:

Learning Objectives:

1. Recall symptoms that impact scoring in neonatal abstinence syndrome
2. Explain the literature surrounding neonatal abstinence syndrome treatment

Purpose:
With the growing prevalence of neonatal abstinence syndrome (NAS), reducing the length of opioid exposure while lessening withdrawal symptoms is essential to optimizing therapy. A methadone guideline developed by the Ohio Perinatal Quality Collaborative was adopted by Mercy Health – Children's Hospital (MHCH) in August of 2017. The purpose of this study was to assess compliance with the tapering guideline and describe the impact on length of stay (LOS) and treatment (LOT).

Methods:
This IRB-approved retrospective chart review included subjects admitted to the neonatal intensive care unit at MHCH who received methadone between September 1, 2017 and August 31, 2018. The primary outcome was compliance with the tapering guideline during the first 96 hours of NAS monitoring. This was measured by the number of noncompliant protocol events, which included methadone dose adjustments, dosing frequency, the total number of doses, and associated Finnegan scores, a NAS scoring tool. Secondary outcomes included LOS, LOT, and Finnegan scores >12, as a potential indicator of uncontrolled symptoms.

Results:
Thirty-seven subjects met inclusion criteria and the average compliance rate was 93.4 %. The common areas of noncompliance were the number of doses being given at a specific titration or mistimed doses. The median LOS was 11.0 days (IQR 6.0-16.0) while the median LOT was 6.0 days (IQR 3.0-11.0). A very weak inverse correlation was observed between LOS and LOT with compliance via Spearman correlation, but it did not meet statistical significance (-0.069 and -0.059, P>0.05). However, there was a weak positive correlation seen between the number of Finnegan scores >12 and LOS (0.378, P=0.0210).

Conclusions:
There was a high level of compliance with the tapering protocol within the first 96 hours of NAS assessment. While the correlation between compliance and LOS/LOT was not apparent, uncontrolled symptoms showed a potential impact on the length of stay.

Sensitivity comparison of open-access and subscription-based drug interaction databases for detecting clinically significant drug-drug interactions among oral antineoplastic agents

Jonathan Wang, PharmD, MPH; PGY1 Pharmacy Resident - The Jewish Hospital – Bon Secours Mercy Health
Michael Bradley, PharmD, BCOP; Clinical Oncology Pharmacist; The Jewish Hospital – Bon Secours Mercy Health

UAN:

Learning Objectives:

1. Discuss factors contributing towards the prevalence of clinically significant drug-drug interactions among patients receiving oral antineoplastics
2. Identify commonly utilized drug interaction databases with reliable sensitivity in detecting clinically significant drug-drug interactions among oral antineoplastic agents

Purpose:

Oral antineoplastics have gained prominence in the past two decades, with a surge in FDA approvals beginning at the turn of the century and a steady rising trend. Recent research has indicated that the reliability and sensitivity of drug interaction databases to detect clinically significant drug interactions often lacks consistency in the setting of these agents. The purpose of this project is to focus on recently approved oral antineoplastics and utilize a methodical approach to select clinically significant drug-drug interactions. Seven drug interaction databases including Medispan – the drug data resource incorporated into The Jewish Hospital's electronic medical record – will be evaluated in their sensitivity in detecting these interactions.

Methods:

Oral antineoplastics will be identified using a published list from CareFirst BlueCross BlueShield. This list will be cross-referenced with Hematology/Oncology Approvals and Safety Notifications issued by the FDA and the Drugs@FDA online database. Drug interaction pairs will be evaluated using Section 2 (Dosage and Administration), Section 5 (Warnings), Section 7 (Drug Interactions), and Section 12 (Clinical Pharmacology) of associated prescribing information. Oral antineoplastics with known strong inhibition or induction properties will qualify for drug interactions with sensitive substrates. Oral antineoplastics that are major substrates of CYP enzymes will be paired with strong inhibitors or inducers. Additionally, a systematic review of PubMed will be conducted using the Medical Subject Headings (MeSH) Advanced Search Builder of the keywords (generic drug name) AND "drug interactions" or (generic drug name) AND "pharmacokinetics". Relevant literature will be objectively evaluated using a Drug Interaction Probability Scale. At least 50 drug interaction pairs will be input into four open-access (Epocrates Online MultiCheck, Drugs.com, Medscape, RxList) and three subscription-based drug interaction databases (Lexi-Interact, Medispan, Micromedex 2.0) to assess their sensitivity of detection.

Results:

To be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

To be presented at the Ohio Pharmacy Residency Conference.

Improving Time to Post-Discharge Laboratory Monitoring after Inpatient Initiation of Aldosterone Antagonists for Heart Failure

Emily Weigand, PhamD- PGY-1 Pharmacy Resident, VA Northeast Ohio Healthcare System
Jonathan Goldberg, MD, MS; Amy Hirsch, PharmD, BCPS; Natasha Conley, PharmD, BCACP; Julie Baron, PharmD, BCGP, BCACP; Sherry LaForest, PharmD, FCCP, BCPS

UAN:

Learning Objectives:

1. Review the importance of timely monitoring of aldosterone antagonists.
2. Discuss the implementation and findings of a standardized process to ensure timeliness of laboratory follow-up for new aldosterone antagonist initiations in the inpatient setting.

Purpose:

Monitoring of heart failure (HF) medications initiated as an inpatient is of high importance due to the complexity of these regimens, and the high comorbid burden associated with HF. 2013 ACCF/AHA guidelines recommend monitoring of aldosterone antagonists within 7 days of initiation due to the risk of hyperkalemia. Baseline data collected at VA Northeast Ohio Healthcare System (VA NEOHS), showed that 24% of HF patients initiated on spironolactone by the cardiology service have a potassium drawn in the outpatient setting within 7 days, and 38% of these patients have a potassium drawn within 14 days. The primary objective of this quality improvement project was to increase the percentage of HF patients initiated on aldosterone antagonists by the inpatient cardiology service who have a potassium drawn within 14 days, from 38% within 14 days, to 75% within 14 days by March 2019.

Methods:

This quality improvement project was conducted at VA NEOHS from August 2018 to March 2019 using Lean Six Sigma methodology. A current state process map was utilized to evaluate the current care process and identify defects. A standardized process was implemented for discharge pharmacists to enter a lab order for outpatient follow-up. The efficacy of each improvement cycle was evaluated using an automated aldosterone antagonist report for all first-fill spironolactone/eplerenone prescriptions initiated in inpatient HF patients.

Results:

Nine patients were discharged from 1/21/19-2/25/19 with a new aldosterone antagonist prescription. 9/9 (100%) of patients had an active basic metabolic panel ordered upon discharge, and 7/9 (78%) had a lab draw within 14 days of discharge. Results are pending for 10 additional patients and will be presented at OPRC.

Conclusions:

Ensuring outpatient laboratory follow-up of aldosterone antagonists prior to discharge was associated with an increased percentage of patients to have a timely lab draw post-discharge.

Impact of Standardizing Pharmacist Involvement in Reviewing Falls in a Community Hospital System

Morgan Weithman, PharmD - St. Elizabeth Healthcare
Jennifer G. Wright, PharmD, Angel N. Kohane, PharmD, BCPS, Elizabeth G. Berryman, PharmD, BCPS

UAN:

Learning Objectives:

1. Discuss the challenges associated with the current hospital system process of pharmacist led post-fall medication analysis and outline changes to standardize and improve this process.
2. Review the effects of standardization of post-fall medication review on provider acceptance of pharmacist recommendations.

Purpose:
In 2015 The Joint Commission (TJC) released a statement estimating that 30-50% of all falls occurring in hospitals result in injury. This statement cited a study that found a single fall with injury added 6.3 days to the hospital stay with an estimated the cost of ~$14,000. TJC listed suggestive actions to address this potential burden including standardizing and applying interventions demonstrated to be effective, particularly regarding post-fall analysis and management. Pharmacists can contribute by standardizing post-fall medication analysis and subsequent interventions.

Methods:
This study is a retrospective review of patients admitted to St. Elizabeth Healthcare who encountered a fall from April 1, 2018 to June 30, 2018 and December 7, 2018 to February 28, 2019. The first reporting timeframe served as baseline. During November and December of 2018, pharmacists at each site were educated on the appropriate procedure for assessing falls and were acclimated to the new documentation setup, follow-up, and completion process. The second reporting timeframe evaluated the primary endpoint, whether standardizing pharmacists' involvement in the review of falls increased the number of recommendations. Patients were excluded if they were bed or chair bound, under the age of 18, or had an alcohol-related fall. Data collected from the electronic medical record included: baseline demographics, nursing unit, John's Hopkins Risk Score prior to fall, bowel or urinary incontinence/ frequency, use of equipment that tethered the patient, vitals prior to fall, time from fall to pharmacy consult and time from consult to pharmacist filing of progress note, number of contributing medications , number of recommendations made, type of recommendation made, method of physician communication, physician acceptance of recommendation, completion of follow-up I-vent documentation, and if the patient experienced injury or death during the admission related to a fall.

Results:
Research in progress.

Conclusions:
Research in progress.

Evaluating pharmacy interventions in the emergency department of a rural community hospital: a pilot project

Jessica Westmoreland, PharmD - PGY1 Clinical Pharmacy Resident Ashtabula County Medical Center
Jordan Vosburg, PharmD; Amanda Kobylinski, PharmD, BCGP

UAN:

Learning Objectives:

1. Discuss a primary literature article evaluating pharmacy services in the emergency department and apply it to a rural community hospital setting
2. Identify key areas for pharmacy intervention within an emergency department

Purpose:

The Ashtabula County Medical Center (ACMC) is a rural community hospital with a 14 bed emergency department (ED) that sees 36,000 patients annually. One potential area for expansion of clinical pharmacy services includes the ACMC ED because of a national rise in ED visits. The CDC reported that of nearly 136.9 million ED visits in 2015, 79% involved at least one medication with an average of 3.1 medications administrations per visit. Additional literature has suggested that pharmacists can cut down the medication errors made in the ED by two-thirds and provide cost avoidance benefit for their services. As a result of high volume and potential for medication errors, the role of the ED pharmacist has grown and increased in demand however, there is little published literature that addresses the role of an emergency department pharmacist in a rural community hospital. The primary objective of this study is to identify and evaluate pharmacy interventions in the ED to determine the practicality of expanding clinical pharmacy services into the ACMC ED.

Methods:

Data from this prospective, observational study was collected over one month while a clinical pharmacy resident was assigned to the ACMC ED. Services provided focused on direct patient care through medication selection, prescribing support, drug information, order review, medication therapy monitoring, and medication history/reconciliation. This project was submitted for IRB approval prior to its conduction.

Results:

Collected interventions will be analyzed for trends to characterize the role of a pharmacist in the ACMC ED and interventions will be assessed for cost avoidance benefit. Additionally the ED staff's perceptions of pharmacy services in the ED were assessed through a survey.

Conclusions:

All data will be reviewed to support or oppose the expansion of clinical pharmacy services into the ACMC ED. Finalized results and conclusions will be presented at the 2019 Ohio Pharmacy Resident Conference.

Evaluation of Direct Oral Anticoagulant Use for Cancer-Associated Thromboembolism

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UAN:

Learning Objectives:

1. Discuss recent literature and current guidelines regarding the use of direct oral anticoagulants (DOACs) in the treatment of cancer-associated thrombosis (CAT)
2. Identify patients at increased risk of treatment failure using DOACs for treatment of CAT

Purpose:
Introduction: Patients with cancer are at a 4-7 fold increased risk of VTE compared to those without cancer. The treatment of choice for cancer-associated thromboembolism (CAT) has been low-molecular-weight heparins (LMWHs). Emerging evidence suggests direct oral anticoagulants (DOACs) may serve as an alternative means of anticoagulation in this patient population. However, no consensus has been reached among guidelines for treatment of CAT. As cancer patients pose unique clinical challenges, real-world data is needed to better assess appropriateness of DOACs for CAT. The primary objective of this study was to assess the incidence of VTE recurrence in patients using a DOAC for CAT.

Methods:
Methods: This retrospective, multicenter study evaluated patients with diagnoses of cancer and CAT treated with apixaban, edoxaban, or rivaroxaban between October 1, 2017 and August 31, 2018. The primary outcome was the incidence of VTE recurrence, and secondary outcomes include incidence of major bleed and incidence of switch to non-DOAC anticoagulant.

Results:
Results: A total of 101 patients met the inclusion criteria during the study period. Treatment failure occurred in 8 patients, a majority of which were due to major bleeding (6%), and the remaining failures due to recurrent VTE (2%). An additional 43 patients were switched to non-DOAC anticoagulants during the study period for reasons other than treatment failure. Patients with metastatic disease were significantly more likely to experience treatment failure compared to local disease or hematologic malignancies. No significant differences in treatment failure were found in subgroup analyses for hepatic impairment, inappropriate renal dosage, interacting drugs, or obesity.

Conclusions:
Conclusion: The results of this study suggest that outcomes of DOAC use for treatment of CAT in real-world practice are reflective of those seen in large randomized controlled trials, and that DOACs appear to be an effective and safe anticoagulation option for patients with CAT.

The effect of antibiotic selection due to beta-lactam allergy status on the rate of surgical site infections

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UAN:

Learning Objectives:

1. Describe perioperative antibiotic prophylaxis recommendations
2. Discuss the possible effect of patient allergy status on perioperative antibiotic choice and surgical site infection risk

Purpose:

Surgical site infections (SSI) represent a significant risk of morbidity and mortality to patients. Financially, each SSI adds nearly $21,000 in increased medical care costs to the healthcare system. While there are several factors which contribute to the development of SSIs, perioperative antibiotic prophylaxis is one of the key guideline supported prevention techniques. Guidelines recommend cefazolin as the primary prophylaxis drug of choice for most surgical procedures based on efficacy and safety data. Established epidemiological studies show anywhere from eight to eleven percent of the U.S. population reports a penicillin allergy. While cross reactivity between penicillins and cephalosporins remains low, there are likely many patients with reported beta-lactam (BL) allergies who do not receive guideline directed, cephalosporin based, prophylaxis. The purpose of this study is to determine if there is a difference in the rate of surgical site infections between patients with and without reported beta-lactam allergies at a large community teaching hospital.

Methods:

A single center, IRB approved, retrospective cohort design study was performed. Data was collected on all targeted surgical procedures performed from January 1, 2017 to December 31, 2017. Targeted surgical procedures included all cesarean section, vaginal and abdominal hysterectomy, colon, spinal laminectomy and spinal fusion surgeries. Patients less than 18 years of age were not included. Data was collected via electronic medical records and included demographic information, length of pre-surgical hospital stay, duration of pre-surgical antibiotic use, BL allergy status, allergy reaction description, procedure type, perioperative antibiotic and SSI development.

Results:

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

Conclusions:

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

A retrospective analysis of chemotherapy associated venous thromboembolism (VTE) risk factors and thromboprophylaxis in an outpatient oncology infusion center

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Eric Betka, PharmD, BCPS, and Jared Austin, PharmD, BCPS, BCOP

UAN:

Learning Objectives:

1. Discuss possible risk factors for the development of VTE in cancer patients
2. Describe evaluation process for assessment of risk for VTE with current practices: Khorana risk scoring

Purpose:

The association between VTE and malignancy is well documented in the literature. There are many different risk factors for the development of VTE in cancer patients. Khorana and colleagues developed a risk assessment model for the risk of VTE in patients initiating chemotherapy (three different VTE risk groups). Khorana risk scores greater or equal to 3 may be considered for VTE prophylaxis prior to initiating chemotherapy. The purpose of this study is to analyze this patient population at an outpatient oncology infusion center to have a better understanding of when VTE prophylaxis would be appropriate in these patients.

Methods:

It is a retrospective cohort analysis, IRB approved, conducted in outpatients who are being initiated on chemotherapy with a minimum of 3 months of therapy from January 1, 2016 through January 1, 2018. Patients were excluded if admitted to the hospital for chemotherapy, have familial and/or acquired hypercoagulability (including pregnancy), have conditions at increased risk of clinically significant bleeding (e.g. active peptic ulcer disease), have objectively confirmed substantial liver insufficiency, have a requirement for long-term anticoagulation, have a platelet count below 50 x 10^9/L, or have any absolute or relative contradictions to anticoagulation. Data were collected via electronic medical records and included: baseline characteristics, risk factors (patient, cancer, treatment related) for VTE, type of VTE/ anticoagulation if appropriate. The primary outcome is to determine the rate of symptomatic or incidental VTE for patients over a follow up of 6 months with Khorana Risk Score greater than or equal to 2 versus Khorana Risk Score less than 2 (without multiple myeloma).

Results:

The rate of VTE was not statistically significant between groups with Khorana Risk Score greater than or less than 2 (without multiple myeloma).

Conclusions:

Further analysis and data will be presented at the 2019 Ohio Pharmacy Resident Conference.

Electronic Prescriptions for Pneumococcal Vaccines: A Pilot Intervention to Address Geriatric Immunization Rates

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Jangus B. Whitner, PharmD - PrimaryOne Health; Andrew Faiella, PharmD, BCACP - PrimaryOne Health; Alexa Sevin Valentino, PharmD, BCACP- The Ohio State University College of Pharmacy and PrimaryOne Health

UAN:

Learning Objectives:

1. Describe the need for improvement in the rate of vaccinations against pneumococcal disease among non-institutionalized adults age 65 and older
2. Discuss how an education intervention on primary care providers about the option to offer geriatric patients an electronic prescription sent to the pharmacy for pneumococcal vaccinations can improve pneumococcal vaccination rates
3. Discuss primary care providers perceptions about offering electronic prescriptions to their patients and to determine feasibility within their workflow

Purpose:

The purpose of this project is to assess the impact of an education intervention on pneumococcal vaccination quality metrics within a federally qualified health center (FQHC). The intervention included educating primary care providers (PCPs) on a new workflow for electronically prescribing pneumococcal vaccinations for appropriate geriatric patients (> 65 years old) to community pharmacies, if the patient is not interested in receiving the vaccination during their office visit. Secondary objectives include 1) determining the rate of vaccination completion at the community pharmacy for those patients who received an electronic prescription, and 2) to assess PCPs' perceptions about offering electronic prescriptions to their patients and to determine feasibility within their workflow. The Healthy People 2020 initiative target for vaccination against pneumococcal disease amongst non-institutionalized adults age 65 and older is > 90%. Community pharmacies have made improvements in immunization rates by offering convenience and accessibility to patients; however, the pneumococcal vaccination rates continue to fall short of Health People 2020 targets with rates as low as 63.6% (2015) and 66.9% (2016). Existing literature has confirmed that patients are hesitant to receive a recommended vaccine at their pharmacy, and concluded that patients are more likely to be vaccinated if they receive a recommendation from their PCP.

Methods:

This a pre/post study that will occur at three locations of a FQHC in Central Ohio between September 2018 and January 2019. In September 2018, the study investigators educated PCPs about the electronic prescription opportunity and how to include it in the conversation with the patients. PCPs were also provided with a pneumococcal immunization algorithm to help identify patients that are eligible for a pneumococcal conjugate vaccine or a pneumococcal polysaccharide vaccine at the time of their medical visit. Three months post intervention a report will be generated from the electronic health record to provide a list of patients who were electronically prescribed a pneumococcal vaccine during the study period. Study investigators will confirm vaccination completion by reviewing the patient's chart. If no documentation of vaccination completion is found, investigators will call the pharmacy to confirm if the patient received the vaccination and then update the patient's chart to reflect that the patient has successfully received the vaccination. Geriatric pneumococcal immunization (GPI) rates will be recalculated via internal reporting software, and the results will be compared to the 3 months prior to the intervention and the corresponding 3 months of the previous calendar year. Additionally, a survey will be given to participating providers to better understand their perceptions and barriers to the new process.

Results:

The difference in rates of completed GPI pre/post educational interventions will be evaluated using descriptive and inferential statistics.

Conclusions:

Findings of this study will aid in determining if this workflow is potentially useful for improving the FQHC's pneumococcal vaccination rates and achieving the Healthy People 2020 initiative target.

Impact of pharmacist interventions in outlying family practice clinics on deprescribing of high risk medications in geriatric patients

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Nicholas Bellman, Pharm.D., BCPS, BCCCP; Christine Liebrecht, Pharm.D., BCPS

UAN:

Learning Objectives:

1. Identify medications that can pose potential harm to geriatric patients as a result of their adverse effects.
2. Recognize common barriers when recommending to deprescribe a medication.

Purpose:
Nearly 20% of geriatric patients potentially take inappropriate medications. This leads to an increased risk of confusion, falls, or hospitalizations. Comprehensive Primary Care Plus (CPC+) is a large multi-payer initiative to improve primary care and lower costs. One metric measures patients 65 years or greater who are prescribed high risk medication(s) (HRM). The purpose of this study assessed the impact of pharmacist interventions on deprescribing of HRM in patients 65 years or greater at five family practice clinics.

Methods:
This study was approved by the Institutional Review Board at Blanchard Valley Hospital and was conducted from December 2018 to March 2019. The electronic medical record system was used to identify patients who are 65 years or greater and currently prescribed one or more HRM by seven different primary care providers. Interventions were formulated from National Committee for Quality Assurance list of HRM and alternative suggestions were based on updated Beers Criteria from the American Geriatric Society. A chart review was conducted on each patient and the following was sent to the provider: name of the HRM, justification of risk, and a safer treatment alternative. A retrospective chart review was conducted to determine if the medication was discontinued. The primary endpoint was the percentage of patients that were deprescribed from their HRM due to the pharmacist's intervention

Results:
Among 78 patients, 23 (29.5%) were successfully deprescribed from their HRM. The most common HRMs were cyclobenzaprine, amitriptyline, and benzodiazepines.

Conclusions:
The preliminary results suggest that pharmacists are able to make an impact in deprescribing HRM(s) in geriatric patients in the ambulatory care setting. However, there are many barriers that can prevent the success of deprescribing: lack of personal relationships with providers, patient agreement, effectively treated with a HRM without adverse effects, and the lack of labeled contraindication with HRMs.

Implementation of a Precision Oncology Medicine Program Utilizing Next Generation Sequencing at a Single Site Outpatient Infusion Center

Stephanie Wonnell, PharmD - University of Toledo Medical Center Pharmacy Resident
Jared Austin, Eric Betka, Derek Gyori

UAN:

Learning Objectives:

1. Review current literature regarding precision medicine
2. Describe next generation sequencing (NGS) and utilization in guiding treatment decisions in oncology

Purpose:
Next generation sequencing (NGS) has allowed clinicians to detect genomic abnormalities that offer treatment options for patients with cancer. Based on recent studies, it has shown that patients who received precision therapy have higher progression free survival rates compared to non-precision therapy. At the University of Toledo Medical Center Dana Cancer Center, the use of NGS has become a common practice. This study will look at the implementation of NGS and assess the impact on utilization of precision medicine.

Methods:
A single site, retrospective cohort study was conducted at The University of Toledo Medical Center. Subjects 18 years and older who received systemic therapy with or without NGS at the Dana Cancer Center from January 1, 2017 through August 15, 2018 were screened for inclusion. Subjects were placed into groups consisting of those that received therapy pre-implementation or post-implementation of NGS. Implementation of NGS occurred January 1, 2018. The primary outcome was the percent utilization of precision therapy pre-implementation and post-implementation. The secondary outcomes were ECOG status, number of identifiable genetic targets, number of hospitalizations, utilization of supportive medications, and number of adverse events causing therapy to be dose reduced, held, or discontinued.

Results:
A total of 97 and 86 subjects were reviewed in 2017 and 2018, respectively, with no statistically significant difference between group baseline characteristics. A 10.64% increase in utilization of precision therapy was observed after implementation of a NGS program. However, this result is not statistically significant given the study was powered to detect a 20% increase. There was a statistically significant difference between rates of additional healthcare utilization in favor of the post-implementation group (106 events; 62 events; $p = 0.049$).

Conclusions:
Implementation of a NGS program may increase the use of precision therapies for cancer treatment and appears to decrease the overall additional healthcare utilization of oncology patients.

Effect of Average Inpatient Blood Glucose Greater Than 140mg/dL on Patient Outcomes

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Jaclyn Boyle, PharmD, MS, MBA, BCACP, BCPS

UAN:

Learning Objectives:

1. Describe the current practice guidelines for inpatient blood glucose management
2. Discuss the risks of hyperglycemia in hospitalized patients

Purpose:

In hospitalized patients, hyperglycemia is defined as blood glucose greater than 140mg/dL. Hyperglycemia can impair wound healing and immune function leading to a higher risk of nosocomial infection. Hyperglycemia can also thicken capillary basement membranes which contributes to a hypercoagulable state. Despite the aforementioned risks of hyperglycemia, the American Diabetes Association guidelines recommend that patient's blood glucose be maintained between 140-180mg/dL. Furthermore, data has shown increased mortality when admission glucose is between 100-200mg/dL. Risk of morality or length of stay greater than nine days is increased in patients with COPD exacerbations and maximum glucose levels between 120-160mg/dL. However, there is very limited data about the effect of average blood glucose levels >140mg/dL on other patient-oriented outcomes in hospitalized, non-critical patients. The primary objective of this study is to determine the impact of average blood glucose >140mg/dL on patient outcomes.

Methods:

This study is an institutional review board approved retrospective chart review conducted on patients admitted to University Hospitals Portage Medical Center from January 1, 2018 to May 31, 2018. All patients over 18 years old admitted to non-critical care units were eligible for inclusion. Patients were sorted into two groups, average blood glucose ≤140mg/dL or >140mg/dL. The primary outcome was a composite of intensive care unit admission, death, length of stay >4 days, development of nosocomial infection, myocardial infarction, ischemic stroke, deep vein thrombosis, pulmonary embolism or new onset heart failure. Secondary outcomes were the rates of each individual outcome and a subgroup analysis of the composite outcome by diagnosis of diabetes. The background data will be analyzed using student t-tests and chi-squared tests. The primary and secondary outcomes will each be analyzed with chi-squared and fisher's exact tests.

Results:

Results and conclusions will be presented at the 2019 Ohio Pharmacy Residency Conference.

Conclusions:

Results and conclusions will be presented at the 2019 Ohio Pharmacy Residency Conference.

Phenobarbital Use for the Treatment of Alcohol Withdrawal Syndrome

Spencer K. Yingling, PharmD - PGY1 Pharmacy Resident Cleveland Clinic Marymount Hospital
Jessica L. Mulhollan, PharmD, BCPP and Lauren Hoffman, PharmD, BCPP

UAN:

Learning Objectives:

1. Explain the pathophysiology, risk factors, and negative outcomes associated with alcohol withdrawal syndrome (AWS)
2. Discuss the potential use of phenobarbital for alcohol withdrawal syndrome

Purpose:
Alcohol withdrawal is a common presentation in patients within the emergency department setting and often requires pharmacologic treatment. While the standard of care for treating these patients revolves around treatment with benzodiazepines, a treatment regimen for patients who develop delirium tremens (DTs) or are refractory to benzodiazepines has not been formally established. Patients who develop DTs usually have a longer hospital length of stay, as well as other complications leading to ICU admission. Phenobarbital is prescribed at our institution as an alternative for the management of AWS. We would like to investigate the safety and efficacy of phenobarbital for this indication, as well as compare outcomes with benzodiazepine treatment strategies available at the Cleveland Clinic.

Methods:
This study is a non-interventional, retrospective chart review comparing patients admitted to the hospital and treated for AWS using various treatment options. Patients were included if they were 18 years and older, admitted to the hospital, and treated for AWS using a benzodiazepine-based Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar) protocol, scheduled benzodiazepine, or scheduled phenobarbital at Cleveland Clinic Marymount Hospital and Cleveland Clinic Euclid Hospital. Patients were excluded if they were prescribed phenobarbital or benzodiazepines for indications other than the management of AWS. The primary endpoint is the evaluation of safety using phenobarbital versus benzodiazepines in patients treated for AWS by comparing the need for escalation in respiratory management, hypotension defined as less than 90/60 mmHg, ECG-identified arrhythmia or cardiac arrest, and death during admission. Secondary endpoints include comparing the efficacy of phenobarbital versus benzodiazepines by assessing the mean decrease in daily CIWA-Ar scores pre/post therapy, total benzodiazepine requirement given per CIWA-Ar protocol, need for escalation in care, development of DTs or seizures, overall intensive care unit (ICU) length of stay, and overall hospital stay length of stay.

Results:
Results/conclusions will be presented at OPRC.

Conclusions:
Results/conclusions will be presented at OPRC.

Efficacy and safety of GLP-1 receptor agonists in patients with chronic kidney disease and type 2 diabetes: A systematic review and meta-analysis

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David A. Wilpula

UAN:

Learning Objectives:

1. Discuss the current literature supporting the use of GLP-1 receptor agonists and describe the benefits they confer.
2. Identify the risks associated with using a GLP-1 receptor agonist in a patient with renal impairment.

Purpose:
Glucagon-like peptide-1 receptor agonists (GLP-1 RA) are rising in popularity for the treatment of type 2 diabetes. However, clinical trials focus on relatively healthy patients, resulting in a knowledge gap regarding the efficacy and safety of these agents in patients with renal impairment. This study aims to compile the available data in order to assess the risks and benefits of GLP-1 RA in this population.

Methods:
This systematic review and meta-analysis analyzed data from randomized controlled trials which compared GLP-1 RA with placebo or usual care. Eligible studies included patients with type 2 diabetes and an estimated glomerular filtration rate less than 60 mL/min. The literature search was completed using the databases EMBASE and PubMed. Search terms included “type 2 diabetes mellitus”, “chronic renal insufficiency”, “rGLP-1 protein”, and the names of all available GLP-1 RA agents. Study eligibility was determined by the two authors. Study outcomes included change in glycated hemoglobin, change in weight, and the incidence of various adverse effects.

Results:
The literature search yielded 253 records, of which 6 were included in the study. The preliminary results indicate that, in patients with renal impairment, GLP-1 RA reduced glycated hemoglobin more than placebo or usual care (n=3; weighted mean difference, -0.252). GLP-1 RA also reduced patient weight in kilograms more than placebo or usual care (n=3; weighted mean difference -3.11). Regarding safety of the medication class, the incidence of cardiac adverse effects was reduced (n=3; weighted mean difference -0.12). Only 1 study in this analysis addressed incidence of pancreatitis or pancreatic tumors, however there were no occurrences of either event in patients with renal impairment. None of the analyzed articles addressed incidence of thyroid tumors.

Conclusions:
In patients with renal impairment, preliminary results indicate that GLP-1 RA are effective at reducing glycated hemoglobin and weight.

Impact of the Expansion of Antimicrobial Stewardship Services During Transitions of Care at Summa Health System – Akron Campus

Stephanie Zampino, PharmD - PGY1 Pharmacy Resident - Summa Health System, Akron Campus
Paula Politis, PharmD, BCPS, Susan Fosnight, RPh, BCPS, BCGP, Thomas M. File, Jr. MD MSc MACP FIDSA FCCP

UAN:

Learning Objectives:

1. Describe the importance of Antimicrobial Stewardship during transitions of care.
2. Report the results of a quality improvement initiative to expand stewardship services upon hospital discharge.

Purpose:
Bacterial resistance has driven the need for antimicrobial stewardship programs (ASP). While standards for ASP implementation in the acute care setting are well established, there is a gap in opportunity as patients are discharged from the hospital. The objective of this project was to determine the impact of expanding the existing ASP on patients discharged with appropriate anti-infective therapy at Summa Health System – Akron Campus (SHS-AC).

Methods:
This was a pilot quality improvement project of pre-post design involving patients discharged from SHS – AC from November to December 2018. Patients were included if they had discharge orders for anti-infective therapy from non-ICU medical floors with no ID consult. Data in the pre-phase was collected retrospectively. Recommendations were made prospectively in the post-phase for appropriate drug, dose, duration or discontinuation of therapy based on evidence-based guidelines and algorithms. The ASP was consulted for consideration as needed. Outcomes included: percentage of patients discharged on appropriate therapy, type of intervention made, recommendation acceptance, antimicrobial days of therapy (DOT), and percentage of C. difficile, readmissions, emergency department visits, or outpatient visits to assess treatment failure within 30 days. Descriptive statistics were utilized.

Results:
Data on 61 patients were collected for each phase. Pre-implementation of discharge ASP, 47.5% of patients were discharged on appropriate therapy versus 85.2% of the post-phase (p < 0.001). Common intervention made include: change in duration (44%), discontinuation of therapy (17%), and change in dose (14.5%). Antimicrobial DOT decreased from 626.5 days in the pre-group to 522 days in the post group. There was a non-significant reduction in 30-day readmissions from 19.7% to 11.5%.

Conclusions:
Expansion of ASP services was successful in improving rates of appropriate discharge anti-infective therapy at SHS – AC. While an absolute reduction in readmissions was also seen in this project, a larger sample size is necessary to further determine statistical significance.

Evaluation of antimicrobial prescribing patterns for asymptomatic bacteriuria at a community based medical center

Steven Zatt, PharmD
Amanda Kobylinski, PharmD, BCGP, Wendy Nagy, R.Ph

UAN:

Learning Objectives:

1. Recognize the need for improved antimicrobial stewardship in the treatment of UTI
2. Identify modern challenges in the inpatient and outpatient treatment of UTI

Purpose:

Inappropriate use of antimicrobials has contributed to higher rates of bacterial resistance and increased healthcare costs. Symptomatic urinary tract infections (UTI) are one of the most common indications for prescribing antibiotics and the incidence of UTI hospitalizations has increased nearly 50% from 1998 to 2011. However, asymptomatic bacteriuria (ASB) in non-pregnant adults is not a valid indication for antibiotic treatment. Routine ordering and misinterpretation of urine cultures in asymptomatic patients may contribute to antibiotic misuse. Despite the availability of Infectious Disease Society of America (IDSA) treatment guidelines, prescribing patterns for the treatment of symptomatic UTI and bacteriuria are highly variable among providers. The purpose of this study is to characterize the antimicrobial prescribing patterns for UTI including the common antimicrobials utilized and duration of therapy and to identify pharmacist intervention strategies to reduce the inappropriate use of antibiotics for UTI at the Ashtabula County Medical Center (ACMC).

Methods:

This is a retrospective chart review of patients who received antibiotics for a diagnosis of UTI. Urinalyses and cultures for adult patients 18 years and older admitted to ACMC from September 1st through October 31st 2018 will be evaluated. Data collection will be completed through chart review using electronic medical records and will include the patient's baseline demographics, allergies, renal function, risk factors, pregnancy status, symptoms of UTI, urine culture and urinalysis results, ordering provider, and antimicrobial course of therapy. Appropriateness of therapy will be determined based on IDSA guidelines for Asymptomatic Bacteriuria, Acute Cystitis, and Catheter Associated UTI.

Results:

Urinalysis data from September 1st through October 31st 2018 are currently being analyzed.

Conclusions:

All collected data will be reviewed; final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Assess health literacy in a rural setting to adapt mobile clinic services for an underserved patient population

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Amy M. Fanous, PharmD, BCACP, TTS; Karen L. Kier, Ph.D., M.Sc, R.Ph., BCPS, BCACP, TTS, FASHP; Michael J. Rush, PharmD, BCACP, CDE, TTS; Morgan I. Borders, PharmD

UAN:

Learning Objectives:

1. Identify risk factors of limited health literacy
2. Discuss ways to provide effective patient education in relation to health literacy

Purpose:
Low health literacy has the potential to impact individuals of all ages, races, incomes, and educational levels. The aim of this study is to identify the level of health literacy of adults in a rural county to adapt clinical services to provide patient specific education from a pharmacist-led mobile clinic. This can lead to healthy behaviors, improved management of chronic diseases, and reduced patient healthcare costs.

Methods:
Hardin County, Ohio residents aged eighteen years and older were screened with the Rapid Estimate of Adult Literacy in Medicine Short Form (REALM - SF) screening tool. The anonymous evaluation form assessed the following demographic information: age, gender, race, and education level. This was provided by trained pharmacists and incorporated into mobile clinic patient intake process. Each patient seeking care at the clinic was asked to participate in the assessment. The assessment was also offered to local General Educational Development (GED) class students, where a partnership with the instructor was established regarding health literacy. The data will be analyzed using descriptive statistics and qualitative metrics for focus groups. The primary outcome of this study is to determine the average health literacy equivalent of Hardin county residents. This information will be incorporated into the design of patient education materials. The secondary objective is to create a literacy appropriate lipids specific educational handout. This will be done through a focus group using the Delphi technique including mobile clinic patients and GED class students. The knowledge gained from the meetings can be extrapolated into the design of more disease state specific and other healthcare-related educational materials.

Results:
Over half (54.2%) of the participants scored a high school health literacy grade equivalent. Majority of participants completed high school education showing education level correlates with health literacy.

Conclusions:
Understanding a patient's educational background can lead to providing more appropriate, individualized care.

Ohio Pharmacists' Knowledge and Utilization of the Patient Care Process

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Mate M. Soric, Pharm.D., BCPS and Lukas Everly, Pharm.D., BCPS

UAN:

Learning Objectives:

1. Recall the five steps of the Pharmacist Patient Care Process
2. Identify gaps in Pharmacist Patient Care Process

Purpose:
The Joint Commission of Pharmacy Practitioners adopted the Pharmacists' Patient Care Process (PPCP) in 2014 to help define expectations of pharmacists. It is unknown if pharmacists are aware of these expectations and how it is being used across the profession. The primary objective of this study is to determine the proportion of Ohio pharmacists who are familiar with and utilize the PPCP.

Methods:
A survey was emailed to all licensed pharmacists in Ohio. Pharmacists who spend less than 20% of time per week in direct patient care were excluded from the study. The survey was validated and designed to assess a pharmacist's usage of the PPCP in a hypothetical patient scenario. Case vignettes assessed a pharmacist's process for care delivery. Data regarding demographic information, pharmacy degree, and practice setting was also collected.

Results:
Of the 812 responders who met inclusion criteria, 698 completed all components of the survey. The majority held a doctor of pharmacy degree (49%), have been out of school 5 years or longer (64.9%), precept students (60.9%) and practiced in a community setting (39.0%). While 62.8% self-identified as having good knowledge of the PPCP, 20.2% ranked their knowledge as none or poor. Only 17% ranked their knowledge as excellent.

Conclusions:
As Ohio pharmacists were just granted provider status, use of the PPCP is critical. Since 20.2% of these engaged pharmacists identified none or poor knowledge and most precept students, education on the PPCP must be provided. How the PPCP is used across practice needs to be addressed and evaluated to ensure its being used and implemented as designed.

Implementation of a pharmacy-based telehealth protocol for medication assisted treatment in opioid addiction at a federally qualified health center

Taylor Engelhart, PharmD - PGY1 Resident AxessPointe Community Health Center
Daniel Krinsky, MS, RPh; Magdi Awad, MSA, PharmD

UAN:

Learning Objectives:

1. Discuss the cause for the growing need of access to medication assisted treatment (MAT)
2. Identify ways that pharmacists can work with various members of the medical team to provide increased access to medication assisted treatment (MAT) in opioid addication

Purpose:
Opioid abuse is a growing challenge in the United States. The need for treatment of opioid abuse is more important than ever; however, accessibility to treatment has not grown to match these needs. Utilization of pharmacists via telehealth could address the access and limited resource issues and improve outcomes in patients with opioid addiction. To date, research has not evaluated the use of a pharmacy-based telehealth protocol with medication assisted treatment (MAT) for opioid addiction. This study seeks to implement the use of a pharmacy-based telehealth protocol to provide access to MAT services in a Federally Qualified Health Center (FQHC) with five locations throughout Northeast Ohio.

Methods:
At initiation, two of the five of the FQHC locations will participate in MAT via telehealth. The 'home site' will be the location where telehealth services are originated by a pharmacy technician and where the MAT would be administered by certified medical assistants (CMAs) or licensed practical nurses (LPNs) when prescribed. The 'distance site' will be where the pharmacist is available via real-time video-technology to meet with the patient. Pharmacy technicians will undergo training to collect vital signs and to instruct the patient on completing the naltrexone readiness documentation form. Providers will refer their patients to the pharmacy MAT service, and that will trigger the telehealth consultation. Once pharmacy technicians at the 'home site' have roomed the patient and obtained the necessary information, the pharmacist at the 'distance site' will be alerted and the teleconference link with the patient will be established. The pharmacist will ask any clarifying questions and determine patient eligibility for MAT. If approved, the pharmacist will order the naltrexone for extended-release injectable suspension and inform the patient and technician at the 'home site' of this prescription and the appropriate follow-up time frame. The pharmacy technician at the 'home site' will prepare the medication for injection and schedule the patient for follow-up. When the medication is ready to be administered, a CMA or LPN at the 'home site' will perform this function. After completion of the visit, the patient will provide a urine specimen to the on-site lab for evaluation. This protocol will be put into action in January of 2019.

Results:
Pending

Conclusions:
We anticipate that establishing a pharmacy-based protocol for MAT in opioid addiction will increase the number of patients in our practice who access MAT, and will provide guidance for other pharmacies and clinics to replicate this service. Expansion of these programs can improve access to treatment to combat the growing opioid epidemic.

Implementation of Buprenorphine/Naloxone Treatment for Opioid Use Disorder at a Federally Qualified Health Center

Rebecca E. Berg, PharmD, Northeast Ohio Medical University/AxessPointe Community Health Centers
Magdi Awad, PharmD, MSA; Daniel Krinsky, MS

UAN:

Learning Objectives:

1. Describe the process of initiating buprenorphine/naloxone treatment for opioid use disorder.
2. Identify the challenges of initiating buprenorphine/naloxone treatment in a primary care setting and ways to overcome these challenges.

Purpose:
The purpose of the study is to establish a protocol for safely initiating and maintaining patients on buprenorphine/naloxone treatment for opioid use disorder in a primary care setting. Buprenorphine/naloxone therapy has been shown to effectively treat opioid use disorder; however, not all primary care providers are able to initiate treatment. This is often due to the additional required provider training, the time-consuming nature of induction and stabilization, and the perceived risk of abuse. The current study seeks to identify methods to overcome these barriers.

Methods:
Prior to the first patient receiving treatment, a protocol was established, patient education and instructions were developed, and a patient agreement was created. Patients interested in buprenorphine/naloxone treatment are referred to a nurse care manager who then schedules the patient for an appointment with a certified provider. Providers perform a physical and screen for indication for buprenorphine/naloxone treatment. At time of induction, patients receive up to two doses of 2mg/0.5mg buprenorphine/naloxone in office. Patients are also given two doses of buprenorphine/naloxone to take home with instructions on when to use. Patients return to clinic the next day to evaluate symptoms of withdrawal and cravings and doses are adjusted as needed. After stabilization on buprenorphine/naloxone treatment, patients will receive treatment for up to six months and then be transitioned to naltrexone injection. The study will evaluate how many patients are successfully initiated on buprenorphine/naloxone treatment, the average duration of treatment, and the number of patients successfully transitioned to naltrexone injection.

Results:
Research is in progress.

Conclusions:
Establishing a protocol for effectively and safely initiating and maintaining patients on buprenorphine/naloxone treatment for opioid use disorder will improve the care for our patients and may allow other providers to reproduce this service in other primary care settings.

An Evaluation of Pharmacy Involvement with Sepsis Management and the Impact on Antibiotic Administration

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UAN:

Learning Objectives:

1. Explain the importance of prompt antibiotic administration for patients with sepsis
2. Describe the role of a pharmacist at point-of-care for sepsis management

Purpose:

Sepsis is a life-threatening condition that presents a significant healthcare concern. An estimated 1.5 million cases of sepsis occur in the United States annually with mortality rates that can exceed 25%. According to the 2016 Surviving Sepsis Campaign Guidelines, it is recommended to administer antimicrobial therapy as soon as possible and ideally within one hour of sepsis recognition. Previously published literature has demonstrated the effect of timely antibiotic administration on sepsis mortality. Ultimately, delays in antimicrobial administration correlate with decreased survival. Improvement in sepsis mortality measures has been defined as a hospital-wide initiative at University Hospitals Parma Medical Center. Involvement of pharmacy services to target antibiotic administration has been identified as a method to improve sepsis care metrics.

Methods:

This quality improvement project will evaluate the effect of pharmacy involvement on sepsis management. Patients receiving care involving pharmacy services will be compared to patients that did not receive care that included input from pharmacy services. Inclusion criteria will consist of patients ≥18 years of age with diagnosis of sepsis in the emergency department or intensive care units. Upon diagnosis of sepsis, a member of the healthcare team will contact the pharmacy resident who is acting as the lead investigator. The pharmacy resident will then assist with sepsis management within the healthcare team. The primary outcome will measure time to administration of broad-spectrum antibiotics after sepsis diagnosis. Secondary outcomes will include antibiotic selection, antibiotic dosing and fluid administration. Descriptive statistics will be used to analyze the collected data.

Results:

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

Conclusions:

The results of this study will be utilized to determine if pharmacist involvement at point-of-care correlates with improved sepsis care metrics and improved patient outcomes. Furthermore, the data could potentially serve to demonstrate that consistent presence of pharmacy at the point-of-care may lead to sustainable improvements in sepsis care. Conclusions will be finalized upon completion of data analysis.