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Poster Presentation Abstracts

Medication Requisition Analysis to Improve Workflow of a Pediatric Hospital System

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Background: Evaluate the current medication stock requisition process between different clinics and determine turn-around times and courier costs.

Methods: Paper data was sorted based on clinic and the three clinics with the highest number of requests (based on June 2022) was selected to be analyzed. Analyzed 01/2023 to 06/2022 data for these three clinics. Data collection included; medication that was ordered, days since last order, monthly average order item quantity, and monthly total order quantity received. Data analysis included pivot tables and data comparison amongst sites to estimate; items per order per month per site, summary of total medications ordered per month per site, summary of days since last order per month per site.

Comparison data was used to determine if an evaluation of the surgery center would be the most appropriate option to minimize costs and optimize turnaround.

Results: Currently the surgery center orders around 400 to 800 items per month with an order being placed about every 5 days. This came down to about 100 items needing to be shipped to main campus, unpack, re-packed, and shipped with a courier to the surgery center every 5 days. When looking at other clinics they had between 50 – 400 items ordered per month, with an order being placed about every 6 days but with the smaller volume of orders the lead technician was ok with this frequency.

Conclusion: Creating a direct delivery system from wholesaler to surgery center will decrease turn-around time from three days to next day reduce courier costs, and saved work hours for staff.

A plan was developed to help transition the surgery center to ordering on their own with some medications still coming from main campus. Next steps will be to transition the surgery center to order directly from the wholesaler 100% of the time without the use of main campus.

Assessing the use of Three Potassium Binders for Hyperkalemia

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Background: Hyperkalemia is an electrolyte abnormality characterized by an elevated potassium level above 5 mEq/L. The three main approaches for the treatment of hyperkalemia involve stabilizing the myocardial cells of the heart to prevent arrhythmias, shifting the potassium intracellularly or by eliminating potassium from the body. One way to eliminate potassium is with a potassium binder like sodium polystyrene sulfonate (SPS), sodium zirconium cyclosilicate (SZC), or patiromer. Current guidance and literature on the use of these three potassium binders is lacking. The objective of this project is to assess the use of potassium binders for hyperkalemia and to develop a system approach on best utilization of these agents.

Methods: A systematic review of 450 patients was conducted to analyze the use of the three potassium binders: sodium polystyrene sulfonate (SPS), sodium zirconium cyclosilicate (SZC), or patiromer between 7/1/2022 – 10/7/2022. Serum potassium, sodium, and magnesium levels, as well as electrocardiogram results were recorded as available prior to administration of a potassium binder. After potassium binder administration, the time to follow up electrolyte levels, resulting electrolyte levels, side effects, and if additional potassium binder therapy was required were also recorded.

Implementation and Evaluation of a New EHR Workflow

Caelee Batterson, PharmD, MSHI, Anne Deitrich, PharmD, Imran Shahbuddin, PharmD, BCPS, MBA, Melissa Dahlgren, PharmD, BCPS

Background: The electronic health record (EHR) order verification screen is used by pharmacists to verify medication orders placed by providers. Within this screen, pertinent patient information, such as current medications, home medications, and labs, are displayed for the pharmacist when a medication order is placed by a provider. Information is also provided for the medication ordered (dispense location, P&T-approved protocols, priority, etc.) Updates to this verification screen is mandatory for future EHR upgrades and optimization. All pharmacists who verify inpatient medication orders will eventually be required to use the new verification screen. The organization utilizes a team of dedicated pharmacists to perform order verification for the entire system. These pharmacists rely on efficient use of the EHR to provide safe patient care. Given the high volume of use of the screen by these pharmacists throughout the health system, changes to the queue warrant evaluation of the impact on verification efficiency and identification of potential areas of improvement. In the past, upgrades that impacted order verification impacted efficiencies so drastically, it required the addition of multiple pharmacists to maintain service standards. The purpose of this project is to coordinate roll out, education, and communication regarding updates to the electronic health record verification screen workflows across the system with additional investigation of potential workflow improvements. This project will focus on developing an optimal plan using a phased roll-out approach and continual end-user feedback to ensure minimal workflow and efficiency interruptions for pharmacists verifying medication orders. Additionally, educational tools will be developed using end-user feedback to assist in the roll-out process.

Methods: Using data collected from a pilot test group, the impact of the updated verification screen on verification efficiency was assessed and used to develop a phased roll-out plan for the system. Additional feedback from the group was provided to the pharmacy informatics team and vendor and used to identify areas of improvements. Volunteers willing to adopt the update early were used to further assess efficiency impacts and create educational tools to assist in training future users.

Preliminary education was created with the help of clinical trainers to reflect current state of the screen. An additional small group of 3rd shift and oncology pharmacists elected to have the screen turned on prior to the full phase roll-out. This small group was used to gather feedback on the current education materials created. Additionally, updates to education were made as the screen was adjusted throughout each phase.

Assessing Recurrent *Clostridioides* Difficile Infections at Advocate Aurora Health Hospitals

Taylor R. Easey, PharmD, Margaret Cook, PharmD, BCPS

Background: *Clostridioides* difficile is a common nosocomial pathogen known to cause serious and sometimes life-threatening infections of the gastrointestinal tract. One of the greatest challenges of managing *Clostridioides* difficile infections (CDI) is the high rate of recurrence among patients who have previously undergone successful treatment. Being able to accurately measure changes in recurrence rates is a critical component of assessing interventions aimed at combating CDI. Recurrent *Clostridioides* difficile infection (rCDI) is a reportable event with common definitions by CDC and the National Healthcare Safety Network (NHSN). The aim of this study was to provide an internal assessment of rCDI corresponding to recurrent, clinical infection, as well as a concurrent evaluation of risk factors, and outcomes at Advocate Aurora Health (AAH) hospitals. A parallel comparison of clinical recurrences observed versus NHSN reportable events is provided. The results of this study were reported the Antimicrobial Stewardship Program and will be used to further inform internal reporting and surveillance to generate clinically meaningful rates of rCDI.

Methods: To aid in the development of an evidence-based definition of rCDI, a literature search and evaluation was conducted to see how recurrence of CDI has been defined in the past. The results of this literature search were presented to a panel of experts to receive feedback. From there, our definition was finalized. Data sets of confirmed positive CDI cases were provided by the system microbiology department. We were also provided a list of NHSN reportable cases of rCDI for calendar year 2021. Patients from the provided list were screened and those that did not meet the definition of recurrence were excluded and rates of rCDI were calculated. Additional key elements of patient information including risk factors for rCDI and complications were collected from patient charts and analyzed.

Results: The definition we used to determine recurrence was any two episodes of CDI that were at least polymerase chain reaction (PCR) positive, were within six months of each other, and that the overseeing physicians determined it was necessary to treat with antimicrobials. This definition yielded a higher number of rCDI cases than what was reportable per the NHSN criteria. 59.3% of these cases were both PCR and toxin positive. 61.5% of recurrences were within eight weeks of each other, 20.0% were within three months of each other, and 18.1% were within six months of each other. 8.8% of the cases were treated only in the emergency department. The most common risk factors for recurrence were prior antibiotic exposure, proton pump inhibitor use, diabetes, and chronic kidney disease. Most patients were treated with oral vancomycin. The most common complication was ICU admission.

Conclusion: When comparing our adapted, clinical definition with the NHSN criteria, the new definition found more cases of rCDI than what was reportable to NHSN. This indicates that the NHSN criteria likely undercounts the true rate of clinical rCDI. Most cases when using our definition were within eight weeks and were both PCR and toxin positive.

Efficacy of Required Indication for Urine Culture Screening and its Effect on Antibiotic Use for Urinary Tract Infections

Beau Blake, PharmD, Stacy Harmon, PharmD, BCIDP

Background: Urinary tract infections (UTIs) are bacterial infections that occur within the bladder and the kidneys. When uro-pathogens from fecal flora or catheters gain entrance to the urethra, bacteria can travel into the bladder, causing cystitis. In some situations, bacteria can further ascend into the kidneys via the ureters, causing pyelonephritis.

Urinary tract infections currently comprise about 35% of healthcare-associated infections. In cases of sepsis with an unknown source, urinalyses are performed, and frequently reflex to culture if there is anything abnormal found in the urine, even when patients have no other urinary symptoms. In one previous study, 62% of patients within inpatient or ED settings had urinalyses performed without specific symptoms of UTI.

Asymptomatic bacteriuria (ASB) is defined as the presence of bacteria in a urinalysis without cystitis symptoms. Symptoms of uncomplicated cystitis include dysuria, urinary frequency, and urgency. Treatment of ASB in patients who are not pregnant or do not have incoming urologic procedures can lead to unnecessary courses of antibiotics that contribute to adverse effects and drug resistance patterns.

The purpose of this study is to evaluate a method for reducing potentially unnecessary laboratory orders of urine cultures in patients who have ASB by encouraging ordering providers to select specific indication.

Methods: This is a retrospective study being conducted among 27 hospitals within a large, private, non-profit health system encompassing facilities in Illinois and Wisconsin (Advocate Aurora Health). In February 2019, urinalysis with reflex to culture orders within the EPIC electronic medical record were reformatted to include adjunct buttons that provide an option for selection of an indication. In March 2020, the buttons were further formatted to require selection of an indication. The following outcomes will be measured during the post-intervention period (January 2021-March 2021) and compared to pre-intervention period (July 2019-September 2019): volume of urinalyses with reflex to culture performed, percentage of urine cultures originating from these reflex orders, and total number of orders for antibiotics with the indication “UTI”. Urinary cultures are performed after a leukocyte esterase, nitrite, or white blood cell count above 10 is found within urinalysis. Adult patients for whom a urinalysis with reflex to culture was ordered were included in the study periods.

Results: During the study period from January 1st through March 31st of 2021, there were 66,996 urinalyses with reflex to culture ordered, with 42,840 of these reflexing to culture. There were 29,111 standalone urine cultures ordered during this period for a total of 71,951 cultures, resulting in 59.5% of urine cultures originating from urinalysis with reflex to culture.

Implementation Pilot of Required Ceftriaxone Stop Dates Across a Multistate, Multihospital, Integrated Health System

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Background: There are well documented long-term consequences of antimicrobial overuse, and it is theorized within the literature that required stop dates on antimicrobial orders will reduce days of therapy and maintain positive clinical outcomes. Furthermore, stop dates have been addressed by the Centers for Disease Control and Prevention (CDC) in the 2019 Core Elements of Antibiotic Stewardship. The CDC summarizes the elements that are necessary for safe and appropriate use of antibiotics, one of which is the optimization of antimicrobial durations of therapy. One recommendation to optimize therapy duration is to implement time-sensitive automatic stop orders for specific antimicrobials. Given this information, the purpose of this project is to implement a pilot of required stop dates upon order entry for ceftriaxone across Advocate Aurora Health (AAH) to determine if required stop dates should be expanded to all antimicrobials.

Methods: A preliminary literature search was completed to explore required antimicrobial stop date implementation processes and results at other healthcare systems. From there, electronic health record alerts were workshopped to address concerns of ceftriaxone orders discontinuing earlier than intended. These alerts along with the new order entry workflow were presented to multiple physician and pharmacist groups to gain feedback and approval. Education on the change and associated alerts was created and distributed to the appropriate groups prior to implementation. Finally, a retrospective review of adult and pediatric ceftriaxone orders at AAH hospitals between January 2022-February 2022 (pre-implementation) and January 2023-February 2023 (post-implementation) will be performed. The primary outcome is system-wide, site-based ceftriaxone days of therapy per 1,000 days present. Secondary outcomes include length of stay and serious adverse events.

Impact of Pharmacy Automated Dispensing Cabinet on Time to First and Second Antibiotics in Intensive Care Unit Patients with Sepsis

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Background: Delayed administration of first and second antibiotic doses is associated with increased mortality in sepsis. Common antibiotics were added to the automated dispensing cabinet (ADC) in the Emergency Department (ED) and Intensive Care Unit (ICU) April 20, 2022. The purpose of the study was to evaluate the impact on time to first and second antibiotics in sepsis after ADC implementation.

Methods: Patients with sepsis admitted to the ICU from the ED January 1, 2022 – April 19,2022 and May 5, 2022 – July 24, 2022 were included. Patients were excluded if the first antibiotic dose was administered at an outside facility. Chart review was performed to identify ED triage time; time first and second antibiotics were ordered, verified, and administered; antibiotic type and origin (ADC or inpatient pharmacy); and mortality.

Results: Eleven patients were included. Time to first antibiotic administration improved after ADC implementation (96.5 vs 90.3 min). Time from pharmacist verification to administration did not change with ADC implementation (30.5 vs 30 min). Eight of eleven (73%) patients received the second antibiotic dose on time. Seven of eleven (64%) patients survived.

Conclusion: Adding antibiotics to the ICU and ED ADC did not improve time to administration after pharmacist verification in sepsis. Interventions to reduce time to antibiotic administration require coordination among the entire medical team for sepsis.

Antimicrobial Stewardship Community Acquired Pneumonia Guideline Adherence Review

Deanna E. Olexia, Rph, Kaitlin Ledvina, 2023 PharmD Candidate, Elise A. Brennan, 2023 PharmD Candidate

Background: Community-acquired pneumonia (CAP) is a common respiratory infection that has an incidence of 3.5 to 4 million cases annually and a hospitalization rate of 20%. The standard treatment for patients with CAP is antibiotics, however, increased use of anti-infectives can lead to associated resistance patterns. More specifically, treatment with systemic antibiotics can temporarily disrupt the normal gut microbiome putting the patient at risk of *Clostridioides difficile* (*C. difficile*). Additionally, unintended events associated with antibiotic therapy, including renal dysfunction, allergic reactions, CNS effects, and others can occur. Due to these associated risk factors, reducing inappropriate or unnecessary use of antibiotics when possible is crucial.

Due to the risk of bacterial resistance as well as the significant disease-burden of CAP on patients and the healthcare system, the Infectious Diseases Society of America (IDSA) has established guidelines to help direct CAP treatment in hospitalized patients. Froedtert & the Medical College of Wisconsin (F&MCW) has created their own internal guideline that includes recommendations for anti-infective treatment with considerations for local resistance patterns. Studies have shown that the implementation of such guidelines is associated with lower inpatient mortality rates in pneumonia patients. The goal of this quality improvement project is to gain insight on internal prescribing practices at F&MCW by assessing provider adherence to the Froedtert Treatment Guideline for Pneumonia.

Methods: Included patients are those who are 18 years or older, have a diagnosis of community acquired pneumonia, have received at least two days of antibiotic therapy, and are inpatients at Froedtert Memorial Lutheran Hospital, Froedtert Menomonee Falls Hospital or Froedtert West Bend Hospital. Patients excluded are those treated for pneumonia within the last 30 days, patients receiving 48 hours or more of antibiotic therapy prior to admission, diagnosis of HAP/VAP, pregnant, severe neutropenia, home ventilator use, or receiving antimicrobials for systemic illness other than CAP. The encounters that this study will analyze will be over a three-month period, from November 1, 2021, through January 31, 2022. A retrospective profile review will be carried out and patient data will be collected and analyzed.

Evaluation of Implementing Insulin Pens Across the Community Hospital Division

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Background: To standardize the use of insulin pens across a community hospital division in a safe and cost-effective manner. Historical use of insulin will be used to determine the resources needed to transition from insulin vials to insulin pens.

Methods: A retrospective cohort study will be used to analyze patient records and system inventory records from Froedtert Menomonee Falls Hospital and Froedtert West Bend from February 1, 2022 to August 1, 2022. Patients will be identified from medical records that indicate insulin use while admitted to these hospitals.

Implementation of an Antimicrobial Dosing Guideline for Patients on Continuous Venovenous Hemofiltration (CVVH) in the ICU

Carla Karczewski, PharmD, BCCCP, Dave Herrmann, PharmD, BCCCP, Zak Zuengler, 2023 PharmD Candidate, Megan Kellicut, 2023 PharmD Candidate

Background: Design an antimicrobial dosing guideline to be used as a reference for ICU pharmacists when assessing for appropriate dose adjustments in patients on CVVH. Dosing of antimicrobials in patients on CVVH is relatively novel and unstandardized. By implementing a guideline, the goal is to create a higher level of standardization and accuracy of appropriate dosing.

Methods: The guideline was created based on literature review and initially included 26 pre-specified antimicrobial medications. "Pre-implementation and post-implementation" data were collected to analyze compliance with the guideline-recommended doses before and after implementation of the guideline. A survey was administered to pharmacists both before and after implementation of the guideline to assess usability and confidence in the guideline-recommended doses.

Hypercoagulability in Post-Surgical Patients Found Positive for COVID-19

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Background: Reduction of thrombotic complications associated with surgical procedures is a continually evolving process to balance bleed and clot risks, specifically due to the increased clot risk correlated with COVID-19 infections. There is a known increased risk of thrombotic complications in patients with COVID-19. Surgical interventions themselves also increase the risk of developing venous thromboembolism (VTE), however this risk relative to the VTE risk of patients with COVID-19 who undergo surgical procedures is unclear. This retrospective study will assess whether the presence of COVID-19 in the surgical patient population is associated with a higher incidence of VTE in comparison to similar surgical patient populations without COVID-19.

Methods: Retrospective electronic medical record review was conducted of eligible patients to collect the medication name, dosing, and duration of chemical VTE prophylaxis used, whether or not a moderate or severe bleeding event occurred, and whether or not a VTE event occurred and the type of VTE event as applicable. Eligible patients included those 18 years of age or older that underwent a surgical procedure on trauma, orthopedic trauma, or acute care surgery services, received chemical VTE prophylaxis after their procedure, and were screened for COVID-19 during their admission. Patients with positive COVID-19 tests will be compared to patients with negative COVID-19 tests for their rates of VTE events.

Specialty Pharmacy Lite - Phase 2

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Background: With an increasing number of specialty medications entering the market, which are more complex and expensive than ever before, the demand for high level pharmacist intervention and guidance to help patients manage their medications is also rising. Pharmacists working in Froedtert Home Delivery & Specialty Pharmacy (HDSP) provide clinical services aligning with URAC and ACHC accreditation guidelines to all patients filling at HDSP, including those not on a specialty medication. Phase one of Specialty Pharmacy Lite focused on establishing a specialty pharmacy "lite" service to provide limited pharmacy services for patients not receiving a specialty medication but requesting monthly refill calls and general oversight of medications. The results of the first phase demonstrated that switching to the lite reviews reduced pharmacist time spent on chart review by 50%. The purpose of phase two is to optimize resources by transitioning Specialty Lite reviews to a pharmacy technician workflow.

Methods: Patients eligible for a Specialty Lite assessment include those taking non-specialty medications, who are requesting monthly reminder calls and require additional pharmacist oversight. In preparation for the workflow transition, pharmacy technician training materials and documentation templates were created to guide the pharmacy technician on how to complete Specialty Lite assessments and how to document in the patient's medical record. The number of assessments completed, the time spent on each assessment, the number of activities performed pre-intervention and post-intervention will be collected as well as the number of assessments escalated to a pharmacist by a technician post-intervention.

Characterization of Emergency Department Patients with Negative Urine Cultures

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Background: At hospitals within the Froedtert Community Hospital Division, pharmacists review positive urine cultures of patients discharged from the emergency department (ED) and provide antibiotic recommendations to providers. However, there is currently no standard process for the review of patients with negative urine cultures. The purpose of this retrospective characterization study is to quantify the number of patients with negative urine cultures who received antimicrobial therapy after discharge from the ED and to identify opportunities to expand pharmacist involvement in stopping unnecessary antimicrobial treatment to optimize patient care.

Methods: This is a retrospective study of patients seen and discharged from Froedtert Community Hospital emergency departments between 1/1/2022 and 6/30/2022. Eligible patients included adults discharged from the ED with a negative urine culture, defined as urine culture that has no bacterial growth or described as normal or mixed flora at the time of culture finalization. Patients were excluded if they were less than 18 years of age or were readmitted within 24 hours of ED discharge. Patients included in this study were assessed for the presence and type of genitourinary symptoms, urinalysis results, and receipt of an antibiotic prescription upon discharge. For patients who did receive an antibiotic prescription, charts were reviewed for further provider or pharmacist involvement such as documenting review of negative urine culture or contacting the patient to modify their antibiotic therapy. The number of potential antibiotic days saved was calculated based on patients that were not contacted.

Gastrointestinal Bleeding Events from Anticoagulants, Antiplatelets, and NSAIDs With or Without PPI Use in an Academic Medical Institution

Margaret B. Ford, 2023 PharmD Candidate, Candice G. Ngo, 2023 PharmD/MBA Candidate, Elizabeth Pieper, PharmD, Benson T. Massey, MD

Background: Understand the prevalence of gastrointestinal bleeding (GIB) associated with high risk medications within an academic hospital and identify interventions used to minimize risk of GIB recurrence.

Methods: A retrospective chart review was performed for patients admitted to Froedtert & Medical College of Wisconsin, Froedtert Hospital - Milwaukee between July 2020 and July 2022. Data was collected through an electronic medical record data request based on inpatient diagnoses associated with gastrointestinal bleeds and prior to admission medications associated with the high risk of bleeding (regardless of dose) including nonsteroidal anti-inflammatory drugs (NSAIDs), anticoagulants, or antiplatelets. The primary outcome is the incidence of upper gastrointestinal bleeding events in patients taking high-risk medications. Secondary outcomes are the rate of patients taking high-risk medications concomitant with proton pump inhibitors (PPIs) and the rate of PPI prescriptions that were prescribed upon discharge for patients following a GI bleed.

Preliminary Results: Of the 42 patients identified with a GIB diagnosis, 76.2 % (n= 32) were taking NSAIDs prior to admission. Additionally, 28.1% (n= 9) confirmed taking NSAIDs with an anticoagulant or antiplatelet agent. Only 15 patients were taking a PPI with an NSAID prior to admission (46.9%). A total of 78.5% (n= 33) were discharged on PPI therapy where 18 of those patients were newly starting a PPI. Also, 90.5% (n= 38) no longer had an NSAID listed on the medication list at discharge. Of these patients, 26 patients (68.4%) were identified to have pharmacists directly involved with NSAID deprescribing.

Preliminary Conclusion: Following a GI bleed, patients may be at high risk of recurrence if any offending agents are not discontinued and additionally may benefit from short term acid suppression therapy to promote healing. While most patients did have these medication changes occur during the project period, there is an opportunity to standardize this process and to increase pharmacist involvement in these interventions.

Development of a Comprehensive Guideline for Anti-Infective Obesity Dosing at Froedtert Hospital

Matthew V. Zimmerman, PharmD, BCPS, Deanna E. Olexia, RPh, Julia E. Kluck, 2023 PharmD Candidate, Emily R. Wendland, 2023 PharmD Candidate

Background: Dosing for anti-infectives can be specific to numerous variables, including the causative organism, site of infection, and renal function, as well as the patient's weight and/or Body Mass Index (BMI). As the prevalence of obesity continues to rise in the US, providers are confronted with decisions regarding the correct dosage of these agents. Currently, Froedtert and the Medical College of Wisconsin (F&MCW) have no comprehensive guidelines regarding anti-infective dosing for obese patients.

We plan to assess the current state of anti-infective dosing in obesity by analyzing the use of four common anti-infectives via a retrospective chart review to assess current dosing trends in obese patients over the past three months. This data collection will allow us to survey a baseline frequency of appropriate dosing in obesity within our organization and assess the need for a comprehensive dosing guideline to guide future patient care. Review of these strategies will provide data prior to implementing a dosing guideline in anticipation of future analyses regarding use of the dosing guideline.

Methods: To create the anti-infective dosing guideline, PubMed will be searched to identify articles in English language using the search terms anti-infective/s (antiinfective/s), obesity, overweight, and anti-infectives and weight-based dosing. A Google search will also be conducted to assess other institutional guidelines on anti-infective dosing in obesity using search terms anti-infective/s (antiinfective/s), obesity, dosing, adults, guidelines, hospital, and institutional. Only education, government and organization domains will be used.

As part of this quality improvement project, a retrospective chart review will also be conducted for anti-infective dosing used for patients who are ≥18 years old with a BMI >30 kg/m2, normal renal function (≥60 mL/min determined by Cockcroft-Gault) and received one dose of either micafungin, cefazolin, Bactrim or daptomycin between January 1, 2022 and March 31, 2022. This information, along with the type of infection, BMI, and indication will be compiled from multiple Froedtert locations to calculate adherence to proper anti-infective obesity dosing and establish a need for a comprehensive obesity dosing guideline. We will also review the Froedtert and the Medical College of Wisconsin's Antimicrobial Stewardship Guidelines for recommendations on obesity dosing for individual anti-infective agents. This guideline is not intended to be an all-inclusive list of anti-infective agents rather and the anti-infectives selected will be chosen based on Froedtert Hospital's antibiogram and commonly used formulary anti-infectives.

Retrospective Review of the Initial Administration Sequence of β-lactams vs Vancomycin for Treatment of Acute Bloodstream Infections or Pneumonia

Will A. Carns, 2023 PharmD Candidate

Background: Recent literature has shown there may be a mortality benefit in administering a β-lactam before vancomycin for treatment of bacteremia when only one antibiotic can be given initially. The purpose of this project was to evaluate the current practice at GLMC regarding the first dose of antibiotic administered for treatment of a bloodstream infection (BSI) or pneumonia.

Methods: All patients admitted to GLMC who were initiated on both a β-lactam and vancomycin for a BSI or pneumonia from September 2019 to September 2022 were evaluated. The type of infection was determined using the indication selected on the antibiotic order at time of order entry. Antibiotics were considered co-administered if the dose was initiated within 29 minutes of each other. If a subsequent antibiotic was initiated within 30 to 60 minutes of the initial, the agent was classified to be given second in sequence.

Results: A total of 319 patients met all inclusion criteria with 173 (54.2%) treated for pneumonia and 146 (45.8 %) for BSI. Most patients received a β-lactam first (254 [79.6%]) compared to vancomycin (65 [20.4%]). Of those patients who received vancomycin first, the largest number was on the medical units (33 [50.8%]) followed by the ICU (20 [30.8%]) and emergency department (12 [18.5%]).

Conclusions: Most patients were given a β-lactam first over vancomycin when only one could initially be administered. There still was however a considerable population that received vancomycin first, indicating it could be beneficial to implement a protocol outlining that a β-lactam is recommended as the first dose antibiotic when both cannot be administered concomitantly. This could be enacted through use of an order set when the provider selects the indication for the initial antibiotic, prompting them to select an appropriate β-lactam.

Evaluating Outcomes in Patients with Potential Drug-Drug Interactions Receiving Immune Checkpoint Inhibitors

Nathan Schieldt 2023 PharmD Candidate, Andrew Ackerman PharmD BCOP, Justin Graff PharmD BCOP

Background: Immune checkpoint inhibitors (ICI) such as pembrolizumab are a common treatment for many types of cancers including lung cancer, melanoma, and breast cancer. Several clinical and preclinical trials have suggested that the gut microbiome may impact the efficacy of ICIs. Proton pump inhibitors (PPIs) and many other commonly prescribed chronic medications may affect the gut microbiome. Currently, the literature regarding the effect these chronic medications has on ICI outcomes is mixed. The purpose of this evaluation is to formulate a recommendation for oncology pharmacists on drug interaction management between pembrolizumab and concurrent chronic medications.

Methods: A retrospective chart review of unique patients receiving pembrolizumab in Aurora Health Care oncology infusion clinics between January 1st, 2019 – December 31st, 2019 was performed. Data points collected include use of prespecified chronic medications (PPIs, steroids [10mg/day prednisone equivalent], HMG-CoA reductase inhibitors, angiotensin receptor blockers [ARBs], angiotensin-converting enzyme inhibitors [ACEi], or aspirin), the type of malignancy, immunotherapy biomarkers, the number of completed cycles, the start/end dates of pembrolizumab, and the reason for immunotherapy discontinuation. The primary outcome is to determine if there is a correlation between use of chronic medications and number of pembrolizumab cycles completed. Secondary outcomes include determining if chronic medications affect the reason for discontinuation of ICI therapy and if immunotherapy biomarkers impact the number of pembrolizumab cycles completed.

Creation and Implementation of Standardized Orientations and System-Supported Learning for Pharmacy Team Members and Residents Across a Multi-State Health System

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Background: Following the Aurora Health Care and Advocate Health Care merger in 2018 to create Advocate Aurora Health (AAH), pharmacy leaders identified several areas for improvement related to system-level learning. The objective of this project is to develop and implement a system-wide plan that addresses these areas. Each year, pharmacy team members with different roles (e.g., technicians, interns, pharmacists, and residents) join the AAH Pharmacy Department and need to be appropriately oriented. Current department orientation practices include each new team member completing assigned training and competencies as outlined per their role-specific orientation manual. It was identified that it would be beneficial to incorporate a centralized system pharmacy orientation session into new team member training. In addition to providing new team members with an introduction to pharmacy leaders within the organization, this orientation serves to cover general topics relevant to any new pharmacy team member and provide an opportunity for team members to network with colleagues at other sites, increasing the camaraderie of the pharmacy department system wide. The second area for improvement is related to system-level learning experiences offered to residents at each site. These experiences, primarily longitudinal, include activities designed to support educational objectives required by ASHP accreditation standards and associated program competency areas, goals, and objectives. Leveraging talent and experiences across the system allows for streamlined learning experiences and associated descriptions. This ensures both consistency across system-level learning experiences and that all AAH residents benefit from these experiences no matter their specific program.

Methods: ***Orientation Component:*** To determine existing orientation practices and identify overlap in competencies, orientation manuals for various pharmacy roles were analyzed. Then, meetings were conducted with key system-level stakeholder groups to ensure all relevant competencies would be included in the orientation sessions. A detailed agenda including system-level leaders involved and their associated topics was developed. Future steps will include selection of a centralized location and quarterly session dates, beginning in fiscal quarter two of 2023. Finally, a comprehensive agenda, as well supplemental materials for the orientation sessions will be created prior to implementation.

Resident Learning Experience Description (LED) Component: Meetings were conducted with system stakeholders to assess both current and ideal state for system-level learning experiences. Additionally, existing LEDs were analyzed to identify overlapping objectives across programs. Based on the findings from above, LEDs were streamlined to ensure learning experience objectives were consistent across the system. Final steps will include socialization of the proposed LEDs with system residency program directors to ensure that proper adjustments can be made to residency program experiences in future years.

Implementation of a Pharmacy Competency Model

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Background: A Pharmacy Competency Model starts with the Education Governance at Aurora. Education Governance includes leaders throughout the Advocate Aurora Health (AAH) system that take a further look into what education and competency is needed for team members. Through the Education Governance Team, the Communication, Education, and Competency (CEC) document exist for the instruction of AAH team members when information is presented that impacts pharmacy operations and/or practice (new, high-risk, changing, problematic). Competency is defined as the application and demonstration of knowledge (critical thinking), skills (technical), abilities, and behaviors (interpersonal) needed to fulfill organizational, departmental, and work setting requirements. It is the idea that education works to meet the individual where they are at and allows them to demonstrate what it is they just learned. The pharmacy competency model uses communication to identify a necessary adjustment of knowledge, education to fill that knowledge gap, and lastly application of this new information through a verification process. Since education alone does not always represent the full understanding an individual obtains, a demonstration of this knowledge not only solidifies the understanding but works to individualize training needs. This model is built to align with the DNV interpretive guidelines. Their accreditation standards require ongoing staff evaluations assigned by a governing body of delegates. Verification of this competency is required and the DNV lists broad recommendations for verification methods, allowing for hospital adaptation. For this project, upon implementation of a competency model, the focus will be on identifying the audience of the model and the method in which verification is obtained, all while maintaining DNV accreditation standards.

Methods: The initial process for implementation consisted of identifying background information and a review of literature for competency models. Existing literature encompassed a model that was different from the vision of the competency model for Advocate Aurora Health. An effort was made to identify live models and compare them with the future, site specific model for Advocate Aurora Heath. An analysis was presented to various committees for expert recommendations. These meetings involved the Competency Subgroup where ideas regarding pharmacy team members, specialty councils, departmental needs, and tracking mechanisms were shared. Recommendations were further discussed with Education Governance, Pharmacy Leadership Council and is now pending creation by Pharmacy Practice Council.

Development and Implementation of a Local Pharmacy Residency Teaching Certificate Program

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Background: Currently available teaching certificate programs for pharmacy residents at the Milwaukee Veterans Affairs Hospital (Milwaukee VA) are managed by area pharmacy schools and have a significant focus on academia. Based on feedback from previous pharmacy residents, the Milwaukee VA Residency Advisory Group identified a need for a local, precepting-focused teaching certificate, which aligned with current national initiatives. Furthermore, a national survey sent to Veterans Affairs stakeholder pharmacy residency program director survey indicated strong interest (75%) in a potential national VA teaching certificate program which could be leveraged and tailored for use at individual VA sites. A national workgroup was formed and collected proposals for teaching certificate program designs from multiple pharmacy departments including the framework submitted by the Milwaukee VA pharmacy team. The purpose of this project is to evaluate a pilot teaching certificate program designed for VA pharmacy residents and to inform its use for future nationwide rollout.

Methods: This project used a single-group post-retrospective survey design. Eligible participants were pharmacy residents at the institution interested in completing a teaching certificate. A teaching certificate framework was created to reflect goals outlined by the American College of Clinical Pharmacy and align with residency accreditation learning requirements from the American Society of Hospital Pharmacists.[1] The framework incorporates readings with pre-existing residency activities (presentations, precepting, residency project) with a teaching philosophy and portfolio. The readings and activities are linked with assessments and PharmAcademic® learning objectives. Participating residents were assigned a teaching certificate mentor who was a practicing pharmacist and residency preceptor within the institution to review completed activities and reflections outlined within the framework.[2] A survey was developed by the project team with 13 post-retrospective questions regarding the confidence or agreement with statements regarding abilities to perform teaching and precepting skills before and after the program. The survey questions used a 5-point Likert scale (1=not at all confident to 5=extremely confident) and three open response questions were included to denote strengths, limitations, and additional comments for the program.[3] Due to a small number of possible participants, ordinal data collected will be analyzed using descriptive statistics.

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Who Killed Mr. Brown? An Interprofessional Hospital Murder Mystery

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Background: Various types of serious gaming techniques have been documented as successful modes of active learning, although few have evaluated the use of a mock murder mystery simulation in professional healthcare programs. Quality improvement (QI) is an essential skill to improve patient and medication safety and can be challenging to incorporate into curriculum. Combining a murder mystery scenario with a root cause analysis project provides an opportunity to apply QI techniques in the classroom that can be applied to hospital settings.

A murder mystery activity was designed for student pharmacists and student nurses to incorporate quality improvement activities with clinical knowledge and interprofessional teamwork. The activity was designed to assess if student can work together to collect and analyze information to determine the correct cause of death in a situation where a hospitalized patient is lost due to medical errors. The activity then required students to complete a root cause analysis to expose them to the process to develop solutions to improve patient safety.

The purpose of this poster is to describe this interprofessional activity, highlight some successes, and identify opportunities for improvement for future iterations.

Methods: In groups of six to eight, pharmacy and nursing students participated in a two-scene murder mystery activity to discover a patient's cause of death. Student groups were divided between two different cases. Each group had 60 minutes to complete the scenario, which was followed by 30 minutes of a group discussion co-led by pharmacy and nursing faculty. During this discussion, students were asked about their approach to the activity and their group's ability to work together as an interprofessional team. Pharmacy students performed a root cause analysis on the event after the activity and outside of class time.

Results: Overall, students worked well together in solving this mystery and most groups were successful in identifying the correct cause of death within the allotted time of the activity. While only the pharmacy students were required to formally complete a root cause analysis, discussion of this process was completed immediately following the activity during the group discussion. Anecdotal feedback suggest that students greatly enjoyed the activity itself and appreciated the inclusion of another healthcare discipline to add their insight into the scenario and the discussions. The use of an interprofessional murder mystery activity was successful in requiring professionals students to work together to carefully analyze a patient scenario to identify processes for improvement in patient care.

Conclusion: Use of a murder mystery is a unique approach to gamification to foster the development of critical thinking skills in a skills laboratory setting.

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Logistics Planning for a Centralized Off-Site Sterile Compounding Training Program for Pharmacy Technicians

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Background: In a large, integrated, multistate health system, standardized sterile compounding training processes are essential for ensuring high-quality compounded sterile preparations (CSPs) are prepared consistently across the system. Without standardization, variations in training processes pose a risk for discrepancies in sterile compounding knowledge, performance, and product preparation processes. The goal of the training program is to provide the foundational principles of sterile compounding processes and aseptic technique in a simulated, low-stakes environment, to ensure safe and accurate sterile compounding occurs across the health system. This project will provide logistical guidance for implementing a centralized off-site sterile compounding training program for pharmacy technicians across a multistate health system, to aid in improving the consistency of sterile compounding training processes.

Methods: A two-day, centralized, standardized sterile compounding training program will be offered to compounding pharmacy personnel across a multistate health system. Throughout the program, didactic lectures highlighting key sterile compounding concepts will be interspersed with simulated laboratory activities. Several logistical tasks must be executed to implement a successful program, including the creation of a program agenda, acquisition and replenishment of program supplies, and creation of an electronic platform for program registration. To assess the impact of the program, confidence in sterile compounding principles will be collected from program attendees, including pre-program and post-program self-reported confidence ratings. Satisfaction with program content, structure, and organization, as well as satisfaction with the program registration process will be collected from program attendees. Results will be obtained via electronic survey submissions.

Implementation of Milwaukee VAs Pharmacogenomic Testing for Veterans (PHASER)

Carissa Popp, PharmD, MSLD, Jennifer A. Koch, PharmD, BCGP, BCPS

Background: Currently at the Milwaukee VA, there are limited pharmacogenomic testing available and they are used sparingly. There is a hesitancy of pursing these tests by staff and veterans due to variables of unknown benefits, costs, and uses. The goal of this project is to implement PHASER at the Milwaukee VAMC along with educational training for staff to customize/target therapy for optimal clinical outcomes such as less trial and error with medications, fewer adverse drug reactions, lower use of opioid medications, greater veteran satisfaction and trust in providers, and improved adherence with medications.

Methods: This was a observational designed project that examined all veterans taking part in the newly implemented PHASER testing. This included any veteran involved 3 months post PHASER launch either pre-emptively or reactively tested. Subjects were included in this study if they were veterans greater than 18 years old, and had the new PHASER testing after 1/1/23. Data collected included demographic information, when testing was completed, the number of unique patient encounters who met study criteria, and which intervention occurred the most based on the PHASER test; increased dose, decreased dose, or changed drug. Additionally, pre and post CE of staff via questionnaire will be taken for the education portion. Descriptive and qualitative analysis was performed to analyze the results.

Video Training Shorts for Aseptic Technique and Sterile Preparations in a Large Midwestern Tertiary Care Center

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Background: Currently, Aurora St. Luke's Medical Center (ASLMC) requires pharmacy technicians to complete an AdvocateAurora Health system standardized training program prior to be able to compound sterile preparations. Sterile compounding learning can be supplemented at ASLMC through written aids with pictures, which are available on ASLMC cloud-based website. To address diverse learning needs, it is helpful to provide information in a variety of modalities. Instructional videos are an alternative option to present information and have been demonstrated to be an effective learning tool. The purpose of this project is to create concise video content to aid in the education of sterile compounding technicians and reinforce sterile compounding principles.

Methods: Prior to filming, video manuscripts were developed using system standard operating procedures, product package inserts, and USP 797 guidelines. Manuscripts were reviewed, edited, and approved by project preceptor. Sterile compounding in the film was performed by a certified pharmacy technician, and video editing was done after filming to incorporate visual on-screen effects, audio voice-overs for additional learning engagement, and clipped for maximum effective content.

Results: Six videos were created, with video length limited to 6 minutes. Video topics include: donning and doffing garb, primary engineering control cleaning, secondary engineering control cleaning, prevention of coring, working in the laminar airflow workbench, and compounding with elastomeric pumps. The finished product was uploaded to ASLMC cloud-based platform, for on demand use.

Conclusion: The instructional videos are available to support current and future sterile compounding technicians at ASLMC, as a supplement to the existing training program.

Improving Pharmacy Resident Research Projects

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Background: Froedtert & the Medical College of Wisconsin is a leading training site for pharmacy residents, with 40 residents trained as part of three PGY1 (post graduate year), three PGY1/PGY2 and six PGY2 ASHP (American Society of Health-System Pharmacists)-accredited residency programs annually. In addition to the pharmacy residency program, Froedtert has a Longitudinal Advanced Pharmacy Practice (LAPPE) program that is composed of over 20 pharmacy students each year. Both residents and LAPPE students are required to complete a longitudinal project, which results in a total of 50-60 projects completed at Froedtert Hospital annually by learners. Currently, projects are submitted by pharmacists across various departments and reviewed by pharmacy leadership as well as the Pharmacy Research Committee. While many project ideas are generated, the ideas do not always match the areas of interest of the learners in need of projects. The purpose of this quality improvement project is to implement changes to the learner project identification and selection process to align projects with resident interests, support and develop additional project advisors and enhance the learning experience for learners at Froedtert & the Medical College of Wisconsin.

Methods: This quality improvement project is a pre/post intervention design. A needs assessment survey was administered to pharmacists, LAPPE students, and pharmacy residents to identify barriers to research and project management. Pre-data will include projects submitted from February-March 2022 as well as number and type of projects presented to residents at orientation in June 2022 through the current process. This year, formal project idea generation sessions and encouraging learners to submit projects will occur during this timeline. Post-intervention data will include the total number of projects submitted between February-March 2023 after interventions from this quality improvement project are implemented.

Results: Focused project idea generation through organized brainstorming sessions, including pharmacists, residents, and students were developed. Of note, in 2022, 93 projects ideas were submitted by pharmacists to be used for resident and student projects. The needs assessment and pre-data was collected from a survey, completed by 110 staff pharmacists, 17 pharmacy residents, and 15 longitudinal APPE students. Many areas of pharmacy practice were represented, the most responses being from internal medicine, critical care, and oncology. 87% of pharmacists reported involvement in a quality improvement (QI) or research project in the past. Over half (57%) of pharmacists have submitted learner project ideas in the past. Pharmacists reported the greatest barriers to project submission were lack of time (74%) and familiarity in appropriately scoping projects (37%). 38% of pharmacists were interested in participating in focused sessions for the purpose of project idea generation.

Pharmacist Perceptions On Utilizing A Personalized Family Medication Safety Plan For Opioid Education

Kourtney A. Peterson, BS, Olufunmilola Abraham, PhD, MS, BPharm

Background: MedSMART Families is an intervention designed to educate adolescents and their families on opioid misuse and how to safely take prescription opioids. The intervention consists of an interactive computer game geared towards children, and a family medication safety plan (FMSP). The FMSP is a template used for patients that are prescribed opioids that prompts users to fill out information such as their medications schedule, side effects, storage and disposal information, and contact information. This study aimed to examine pharmacists' perspectives on the FMSP and opportunities for future adaptations to improve usability.

Methods: This was a cross-sectional qualitative study. Eligible participants were pharmacists with access to a computer and webcam. Participants were recruited via email listservs from PearlRx and PSW and interested pharmacists completed a virtual interview via Webex where they provided feedback on the FMSP and answered structured questions asked by the interviewer regarding their perceptions of it.

Results: Twenty pharmacist interviews were conducted between September 2021 and March 2022. After transcribing and analyzing these interviews, four key themes were developed: the purpose of FMSP as a communication tool, clarifying instructions on how to use FMSP, barriers to using FMSP, and suggestions to improve the FMSP format.

Conclusion: Most pharmacists reported that the FMSP was a useful tool to use during patient education both for pharmacists and patients. Pharmacists can use the FMSP to provide structure during their consults and tailor them to specific patients. The FMSP can prompt patients and their families to ask questions and actively engage in conversation with their pharmacist or provider. Feedback provided from pharmacists regarding the FMSP will be used to make future adaptations to it to ensure optimal use.

Diversity, Equity, and Inclusion within the Pharmacy Enterprise of an Integrated Health System - Development of a Data Dashboard with Actionable Metrics

Sophia R. DiGiambattista, PharmD, MSHSA, Jessica Moschea, PharmD, BCPS

Background: Health equity means "everyone has a fair and just opportunity to be as healthy as possible." To achieve health equity, healthcare organizations must prioritize a culture of diversity, equity, and inclusion (DE&I). Healthcare organizations with strong DE&I initiatives deliver higher quality care, experience better health outcomes, build relationships with diverse community partners, and create inclusive work environments, leading to higher job satisfaction and team member engagement.

The DE&I strategy at Advocate Aurora Health (AAH) includes a data dashboard with DE&I metrics. A data dashboard is a tool used to summarize, display, and track data related to performance metrics and goals. Dashboards connect multiple different data sources, while displaying data in a user-friendly way. This allows organizations to quickly measure progress and visualize trends for certain performance indicators.

The purpose of this project is to develop and implement an ongoing performance dashboard that contains pharmacy-specific DE&I metrics. This dashboard will be used to evaluate current trends within the DE&I culture of the entire AAH pharmacy enterprise. The dashboard will be available to important stakeholders, including the system pharmacy DE&I team, administrators and leadership personnel, and care coordinators. Ultimately, this dashboard will aid in the identification and closure of gaps within DE&I.

Methods: Pharmacy-specific performance metrics for the dashboard were determined by authors and input from the system pharmacy DE&I team. Metrics fall under three main categories: workforce, consumer, and community. These categories match the DE&I strategy for the AAH organization. A few of the performance metrics include business diversity spend and discharge prescription capture rate. Building this dashboard requires input from multiple disciplines including ambulatory care, inpatient care, human resources, business operations, and data analytics. Data for the dashboard is currently being collected.

Review and Implementation of ASHP's Standardize4Safety Oral Liquid Compound Standardization within a Health System

Melissa A. Smith, 2023 PharmD Candidate, Amber M. Ball, PharmD, Jessica L. Page, PharmD, MBA

Background: In 2008, the American Society of Health-System Pharmacists (ASHP) created a Standardize 4 Safety initiative. The goal was to standardize a subset of medications to promote patient safety. Two standardized concentration lists were created with collaboration among pharmacists, nurses, and physicians: one list focused on narrowing the concentrations down to one single concentration for compounded oral liquid medications while the other list focused on standardizing IV continuous medications for adults. The aim of this project was to identify opportunities to standardize 28 oral liquid compounded medications that were identified by ASHP across Froedtert Health Enterprise.

Methods: Two years of data were collected ranging from 07/01/2020 to 06/30/2022 which included patients prescribed and/or dispensed one or more of the 28 oral liquid compounded medications. Data analysis included assessing which concentrations were currently being compounded, which standardized recipes were available, if appropriate literature existed for each recipe, and if it was feasible to implement the standardized concentrations recommended by ASHP. Of note, ASHP's recommendations included 29 oral liquid compounded medications, one medication for the purpose of this project was excluded due to standardization the year prior.

Results: Fifteen of the 28 oral liquid compounded medications were found to not have been compounded in the past two years. Twelve of the previous 15 non-compounded liquid medications were found to have no active compounding recipes. Six of the 28 oral liquid compounded medications were found to already be standardized per ASHP's recommendations. Ten of the 28 oral liquid compounded medications were found to not be standardized per ASHP's recommendations and require additional review to implement standardization. Eighteen compounding recipes are to be removed to eliminate excess or duplicative concentration recipes, outside of ASHP's recommendations.

Conclusion: Standardization will lead to decreased risk of medication errors, improved patient and provider satisfaction, enhanced provider efficiency, stronger collaboration amongst healthcare professionals and safer transitions of care. Key stakeholders across sites of care are to meet to discuss implementation of standardized concentrations. Implementation will involve elimination and addition of recipes to align with ASHP's concentration recommendation. Future directions include annual audits of the concentrations to ensure no additional concentrations are added and sharing the data we collected with other facilities to engage in the conversation of safety when it comes to transitions of care.

Evaluation of Perioperative Medication Administration Holds and Retimed Doses

Kurt Weisheimer PharmD, Kelcy Doede PharmD, BCPS, Laura Holyoke PharmD, BCCCP, Dan Persells PharmD

Background: The objective of this evaluation is to investigate automatically held medication orders during procedures and identify how different procedural workflow methods impact the number of missed or retimed doses after the patient returns to the floor.

When patients are transferred from a unit to a procedural area, scheduled medications are placed on hold temporarily through an "auto-hold" feature within the electronic health record. Once the patient returns to their unit these held medications can be resumed. If a scheduled medicine's due time passes during the procedure, the dose will remain charted as "auto-held" even after the order is released.

These held doses must be reassessed post-operatively and a determination must be made whether they should be made-up or retimed. The way this is performed throughout the system varies by hospital. This evaluation compares the amount and type of missed or retimed doses during this post-operative period to identify best practices methods and identify areas for improvement.

Methods: This evaluation involved mapping how the current medication administration record (MAR) functions in the electronic health record and how it is used in relation to surgical procedures. Pertinent steps included discussion with site nursing, Pharmacy IT, and administrative staff to clarify current practice patterns and how healthcare staff utilizes the electronic medical record prior, during, and after surgical procedures. Incident, patient safety, and compliant entry reports were collected through the assistance of the medication safety department to identify reported medication events related to procedural medication holds.

An EHR report was used to flag all medications that were marked as "held" in the MAR during surgery. These held medications were then manually reviewed to see if a held dose was appropriately retimed, given, or missed post-operatively. This data was then analyzed to compare incidence of missed and retimed doses between different hospitals and practice methods.

Implementation and Evaluation of a Gravimetric-Based Intravenous (IV) Workflow Software System in a Veterans Affairs Medical Center Pharmacy

Kurt Weisheimer PharmD, Kelcy Doede PharmD, BCPS, Laura Holyoke PharmD, BCCCP, Dan Persells PharmD

Background: Manual steps within the Intravenous (IV) medication compounding and preparation process at the Clement J. Zablocki VA Medical Center (ZVAMC) create potential for human errors that may impact patient safety. The manual verification process for validating the proper addition of drugs, vehicles, and diluents were used in IV compounding along with pharmacy technicians completing manual calculations are vulnerable to human error that may go unrecognized. If recognized, the facility utilizes the Joint Patient Safety Report (JPSR) System for employees to report the hazard or the error. Upon reviewing JPSR data in 2022, reporting of IV compounding errors is rarely submitted. The objective of this quality improvement project is to implement gravimetric based IV workflow software system. Following implementation, the project will evaluate this technology's impact on the identification of previously unrecognizable IV compounding errors.

Methods: This quality improvement project is a causative experimental pre-post project utilizing a proactive risk assessment. A failure modes and effects analysis (FMEA) will be conducted on the current IV compounding workflow process for the identification of potential risks. Information gathered from this FMEA will be utilized to implement standardized IV pharmacy workflow. The primary outcome is change in error detection rates with the IV gravimetric-based intravenous (IV) workflow software system process as compared to the manual verification process. Secondary outcome measures will include: IV preparation time and medication waste. Data will be collected manually by the IV technicians over a 1 month period pre-implementation and post-implementation. The technicians are to document any notable errors with the compounded medication that results in medication waste and will manually time when a medication order has been verified by the IV pharmacist to after it is compounded and checked by the IV pharmacist. Data will be analyzed using a paired T-test.

Review of Det Norske Veritas Findings and Corresponding Actions Across a Multi-Site, Multi-State Health System

Michael A. Keeney, PharmD

Background: Review Det Norske Veritas findings and evaluate corrective action plans to ensure comprehensive, systemwide impact for gap closure.

Methods: DNV findings from 2020 through 2022 were evaluated and delineated according to hospital location and year of finding. Findings were then separated by similarity into 5 distinct categories to assess frequency of finding occurrence. Corrective action plans associated with DNV findings were evaluated and reviewed for organizational responses and persons responsible for overseeing the corrective action plan. Efficacy monitoring data were collected and evaluated for each corrective action plan. Efficacy monitoring data for similar DVN findings categories were compared to assess the trajectory of improvement for a given corrective action plan.

Implementation of an Inventory Management System for the Advocate Aurora Health (AAH) Code Cart Medication Replenishment Process

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Background: Medication restocking and verification workflows differ across the AAH system. Pursuing an appropriate inventory management solution for code cart replenishment has the potential to increase patient safety and improve procedural efficiency. In previous system research, utilization of RFID (radio-frequency identification) technology was found to be ideal for reducing pharmacist time spent verifying code cart trays while remaining cost-effective. It was determined that the vendor already used by AAH hospitals in Illinois provided the most suitable product for system-wide use during code cart medication replenishment with its RFID-based platform. This project aimed to pilot that platform for AAH hospitals in Wisconsin.

Methods: Contract negotiations streamlined initial interest in a full vendor suite of products to the RFID-based platform alone, allowing efficient development of system infrastructure to support the product. At this time, questions on how to integrate the new platform into system processes were addressed, such as the impact on cost and labor when considering a centralized component of the workflow. Education was also created to prepare interested AAH hospitals for implementation of the technology. Following negotiations, project involvement by Wisconsin hospital sites was voluntary. Participating sites served as pilot cases to generate process improvement data and showcase the benefit of the technology. This was augmented with data collected from Illinois hospital sites already using the RFID-based platform to build a business case for stimulating additional system interest. The final phase of implementation would optimize product usage and explore application beyond code carts as well as expand the platform to all AAH hospitals.

Conclusion: Implementation of an inventory management system to assist in code cart medication replenishment offers numerous operational and patient safety benefits. Functions such as improved expiration date tracking allow for reduced waste through proactive inventory cycling. The ability to track products also adds a layer of patient safety with RFID technology, a valuable tool during drug recall scenarios. In addition, integrating the new process has the potential to improve workflow efficiency and optimize utilization of technician and pharmacist work hours. However, further data must be collected after implementation to best assess the safety benefits and associated costs of this system.

Minimizing Delays in Completing Medication Histories in the Critical Care Setting

Mark B. Botros, PharmD, MS, Amanda L. Van Voorhis, PharmD, BCPS, Sarah J. Klemm, PharmD, BCCCP

Background: Medication history collection is a critical step in hospital admission, setting the stage for the entire hospital stay. Delays in medication history collection and reconciliation can have a profoundly negative impact on patient outcomes.

Delays in the medication history process are more pronounced in the critical care setting, where acuity impedes timely patient interviews. Currently at Advocate Aurora Health, medication history technicians interview patients upon admission and verify the collected medication history through a secondary source utilizing electronic resources. Advocate Aurora Health has established medication history goals of completing 80% within 6 hours and 90% within 24 hours of admission. These new goals present an opportunity to utilize readily available resources for medication histories. By using caregivers and electronic health records we aim to minimize process delays associated with patient's ability to conduct an interview, while improving accuracy and reducing patient recall bias.

This project aims to achieve two objectives. First, to develop an algorithm-based guidance and workflow to collect the best possible medication history utilizing readily available resources. Secondly, to assess the impact of this initiative on the timeliness and accuracy of medication histories in the intensive care units at Aurora St. Luke's Medical Center. We aim to empower technicians through proper guidance to increase efficiency and decrease overall team member task burden throughout the process.

Methods: Pharmacy medication history review times were collected from July-September 2022 at Aurora St. Luke's Medical Center to identify a pre-implementation baseline. The history review time identifies the time from admission until the medication history is marked completed on the electronic health record. Through discussions with different specialty governing committees, a guidance document was developed to help medication history technicians utilize all the available resources in providing a timely and accurate medication history. After implementation, pharmacy medication history review times will be collected for the first three months of utilizing the new workflow. Post-implementation analysis of a randomized patient sample will be conducted to evaluate the accuracy of the new medication history workflow. The accuracy analysis will compare medication history information collected through the new workflow against a patient interview conducted later in the hospital admission. The analysis will focus on medication discrepancies based on what the patient reports that could not be identified through an electronic health record. Final analysis will evaluate the overall impact of this initiative on the timeliness and accuracy of the collected medication histories.

Assessment of IV Robotic Implementation for Advocate Aurora Health (AAH)

Moataz Ali, PharmD, MBA, Mark Hamm, PharmD, MBA, and Kyle Sabol PharmD, BCPS

Background: The purpose is to identify and assess all possible IV robotic options for our health system in regards to sterile compounding. Implementation of robotics provides benefits of increased quality, accuracy, and opportunities to optimize pharmacy workflow. Companies including Omnicell, Loccoini, etc. have options for products that can be implemented in IV rooms, and they come in different designs where they may need infrastructure considerations or may not depending on the design of the machinery. Additional considerations are reliability, mechanisms and output rate, and significant cost impact with purchasing this type of technology.

Methods: To ensure adequate information collection and assessment, initiatives were made to meet with all possible vendors known to us and they are on the market to gather insight on options for IV robotics. This included traveling to vendor locations to discuss their robotic products and even visiting health systems that currently possess and utilize IV robotics in their pharmacy operations. Once rapport was established and goals were outlined covering our expectations and what services could be provided with the vendors we met with, further discussions were established to collect a variety of standardized aspects believed to be needed from all vendors as a standard of comparison. Aspects including pricing, detailed dimensions, output, structure and storage parameters, and any infrastructure modifications needed were all gathered from health systems. Moreover, in next steps of building business cases and exploring ROI opportunities, we are providing data to the vendors covering our dispense volumes to gather insight on these opportunities to further narrow our selection process.

Analysis of Medication Therapy Management (MTM) Services Workflow Optimization

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Background: The roles of community pharmacists have evolved over the years from primarily filling prescriptions to being involved in managing chronic medical conditions. The healthcare system's shift to a value-based model increased novel strategies to improve population health outcomes while minimizing downstream costs. Due to accessibility and expanded clinical care models, community pharmacists are effective members of the interdisciplinary team capable of managing and improving population health outcomes through medication therapy management (MTM), comprehensive medication review (CMR), or targeted intervention programs (TIP). Thankfully, MTM interventions address issues of polypharmacy, preventable adverse drug events, medication adherence, and medication misuse. The purpose of this project is to establish an MTM workflow to provide drug therapy management services to patients and integrate this service into daily pharmacy workflow. This service will expand additional opportunities for eligible patients within the Froedtert Home Delivery and Specialty Pharmacy (HDSP) and Froedtert Pharmacy-Specialty Clinic.

Methods: From January 2023 to March 2023, designated staff pharmacists will perform MTM, CMR and TIP services, complete telephonic discussion with patients, document required interventions and time spent in EPIC and MTM Outcomes of all eligible patients at the Froedtert HDSP and/or Specialty Clinics pharmacy. Eligible patients include patients who use the Froedtert HDSP or Froedtert Clinics pharmacy an those included in the MTM Outcomes Report which identifies patients who may benefit from MTM interventions. To assess patient's adherence and medication compliance, patient's fill history will be utilized via Epic Willow Ambulatory Module (WAM) and shipment history, using the average number of shipments per month as a measuring parameter. Once fill and shipment history is obtained a percent of days covered (PDC) for a 3 month duration will be calculated. Telephonic follow-up will be completed for each patient and documentation of interventions will be recorded via Epic Hyperspace using a pre-populated template.

Utilizing a Scoring Tool Provided within an Electronic Health Record to Reduce Admissions Related to Low Risk Pulmonary Embolism Across the Ascension Wisconsin Health System

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Background: Pulmonary embolism (PE) occurs when a thromboembolism occludes a pulmonary artery thereby limiting perfusion to the respective lung segment. Once PE is diagnosed, a risk stratification tool, PESI or sPESI, is employed to determine the patient's 30-day mortality risk after diagnosis along with the clinical severity of the patient.[1] There are four categories of PE severity: i. High Risk ii. Intermediate High Risk iii. Intermediate Low Risk iv. Low Risk. High Risk PE includes hemodynamic instability (cardiac arrest, obstructive shock, persistent hypotension). Intermediate High Risk involves dysfunction of the right ventricle (imaged either with a computerized tomography angiography (CTA) or transthoracic echocardiography (TTE)), raised troponin levels, PESI score III-V or sPESI ≥1, but no hemodynamic instability. Intermediate Low Risk involves dysfunction of the right ventricle or raised troponin levels with a PESI score III-V or sPESI ≥1, also with no hemodynamic instability. Low Risk involves the absence of both right ventricular dysfunction and elevated troponins with PESI score I-II or sPESI 02. Low Risk PE can qualify a patient for discharge from the emergency department on outpatient treatment of anticoagulation, specifically direct acting oral anticoagulants (DOACs), granted the patient also has appropriate resources for outpatient care and no aggravating co-morbidities.

Ascension Wisconsin emergency departments are staffed by Emergency Medicine Specialists, S.C. (EMS). Each of these emergency departments utilize Epic as their electronic health record (EHR). They evaluate many patients who are ultimately diagnosed with a pulmonary embolism (PE). Some of these patients exhibit outward signs such as dyspnea while others demonstrate minimal symptomatology. Currently Epic does not have built in calculators for either Pulmonary Embolism Severity Index (PESI) or Simplified Pulmonary Embolism Severity Index (sPESI). Instead, providers use physician group-provided guidelines or external websites, such as MDCalc, to calculate such scores. Lastly, as with previously-built scoring tools (ex. CHA2DS2-VASc, GCS, etc.), the providers are unable to populate the scoring tools when switching over to the progress note tab, nor can they populate the score into a progress note.

Methods: First, Ascension St. Joseph's clinicians will investigate the need to implement PESI/sPESI scores by gathering data on patients diagnosed with PE in the previous six months. Second, complete an EHR workflow tracer and discussion with a physician to understand the extent of support needed to build the scoring tool. Last, explore how existing scoring tools are built in EHR and how other scoring tools impact physician decision making. The primary objective will be to analyze data from the six month study to assess if physicians appropriately discharged low risk PE patients or document their intention to, but ultimately didn't due to extenuating circumstances(social constraints related to poor outpatient care and comorbidities). The secondary objective will be to survey if physicians are receiving clinical support from their EHR (best practice advisory, alerts, PESI scores mentioned in progress note).

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Optimizing the Pharmacist Clinical Expert Communication Structure for a Large, Multistate Health System

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Background: Advocate Aurora Health is a large, multistate health system that cares for thousands of patients every day. The hospitals range in size from under 50 beds to over 700. To ensure the highest quality of patient care provided by the pharmacy department, Advocate Aurora Health created the Expert Pharmacist Compendium. The Expert Pharmacist Compendium is a document that provides pharmacy members with a list of pharmacist experts in a variety of categories and how to contact them. The Expert Pharmacist Compendium ensures that clinical experts within the system pharmacy department are known and accessible to everyone, regardless of practice location. Currently, the Compendium is under-utilized and is formed by self-reporting of expertise. The lack of standardization leads to a compromised document integrity and inconsistency. The objective of this project is to optimize the pharmacist expert compendium to ensure consistency of care across an ever-growing pharmacy department.

Methods: The vital steps in this project include collecting feedback on current practices, creating standards for inclusion for the Expert Pharmacist Compendium and responsibilities of said members, collecting interest in participation, and formation of expert groups. Each expert group will be assigned to a designated communication channel in the EMR or via other pre-determined channels for non-clinical related experts. All system pharmacists will be encouraged to communicate through these channels. The utility of this new process will be assessed via pharmacist satisfaction survey.

Developing a Continuing Professional Development Toolkit for Pharmacy Team Members and Leaders in a Multi-State Health System

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Background: As outlined by the Accreditation Council for Pharmacy Education (ACPE), Continuing Professional Development (CPD) is a "self-directed, ongoing, systematic, and outcomes-focused approach to lifelong learning that is applied into practice". Participation in CPD can occur through any activity that helps an individual accomplish their personal or professional goals, both formal and informal. There are numerous advantages to participating in CPD, including career advancement, skill development, continued support of foundational knowledge, and the promotion of self-improvement. Though existing internal health system CPD resources have been promoted in the past, they have been limited in both number and applicability to the pharmacy team. Therefore, a CPD toolkit was developed to support all system pharmacy team members with the resources needed to effectively develop, track, reflect, and follow-up on CPD plans.

Methods: Current best practice for CPD toolkit design and implementation was gathered through extensive literature review. As a result, an interactive, electronic CPD toolkit designed to walk a learner through the CPD cycle (reflect, plan, act, evaluate, record) was established as the ideal deliverable format. Expanding upon the literature, the creation of a standardized, electronic CPD plan tracking mechanism accessible to all system pharmacy team members was planned. Internal health-system electronic document libraries were surveyed to identify existing career advancement and CPD plan resources. Suitable, accessible electronic delivery methods for the CPD toolkit and tracking mechanism were gathered through the evaluation of previously implemented health-system software. Additional missing or undeveloped health system/pharmacy department educational CPD resources were determined using an informal gap analysis. The CPD toolkit and tracking mechanism were then constructed using existing health system and pharmacy department resources, as well as findings of the informal gap analysis. Upon completion, the toolkit was piloted with select pharmacy leaders and their team members across the health system throughout early 2023.

Standardization and Implementation of Hypersensitivity Medication Kits in a Multistate/ Multihospital Health System

Tasha N. Roshan, PharmD, Jennifer A. Lester, PharmD

Background: Advocate Aurora Health (AAH) is a multistate and multihospital health system that encompasses 28 hospitals with more than 500 sites of care. With multiple sites of care, standardization of processes amongst these sites allows for ease of practice. In 2021, the AAH Nursing Oncology Specialty Subcommittee (NOSS) developed a workgroup to address the need for the standardization of storage and contents for hypersensitivity kits in both inpatient and outpatient areas where chemotherapy/immunotherapy agents are administered. In March 2022, NOSS approved the contents of a physical hypersensitivity medication kit to include epinephrine, methylprednisolone, diphenhydramine, and related supplies.

At the same time, when NOSS was discussing standardization, the pharmacy system was also noticing an increase in reported medication events related to epinephrine. It was identified through a pharmacy survey that some AAH sites have their own site-specific anaphylaxis or reaction kits loaded in automated medication dispensing systems along with a system standard epinephrine kit for IM administration. The nomenclature for the epinephrine kit includes the word "anaphylaxis" to allow team members to search for either epinephrine or anaphylaxis to remove the kit from the automated medication dispensing system. The potential for error arises when multiple kits having their name include "anaphylaxis" are loaded in an automated medication dispensing system and various options are available to select.

The initiative taken by NOSS along with the identified medication safety concerns created the opportunity for pharmacy to standardize the content and storage of medication kits to be used in response to hypersensitivity reactions occurring in inpatient hospitals, outpatient oncology clinics, and hospital-based infusion centers.

Methods: Contents of the hypersensitivity kits were finalized based on nursing recommendations. A decision was made to create physical kits instead of virtual kits in the automated medication dispensing system. Cost of the kits was calculated to determine if all sites could utilize the kits and maintain 340B compliance. Medication usage for inpatient sites, outpatient oncology clinics, and hospital-based infusion centers from January 2022 to October 2022 was assessed and a process for centralized preparation and distribution of kits was established. Approvals from medication safety, oncology, and pharmacy leadership committees will be obtained. An entry will be created to allow for storage in the automated medication dispensing system. Plans to work with all impacted sites will be in place to implement utilization of kits.

Pharmacy Recognition, Research, and Publication Support

Sara A. Witt, PharmD, Nicholas C. Ladell, PharmD, BCPS, MBA, Julie K. Dagam, PharmD, BCPS, FASHP, Christina C. Hannon, PharmD, BCPS, MBA

Background: Develop and implement strategies to augment and celebrate professional contribution in an integrated health system

Methods: Meetings with key stakeholders, pharmacy leaders, and the pharmacy newsletter communication lead were held to learn about relevant concerns regarding the previous pharmacy team member recognition process and identify needed support materials. Stakeholders met on a regular basis to determine the recognition process, including which the types of team member achievements to be targeted, the specific data to collect, and the display mechanism. Potential strategies to support professional contribution efforts were also identified in these meetings.

Establishing a Framework for a Pharmacy Internship Program within a Large, Integrated Health System

Grace L. Dyke, PharmD, MBA, Christina Hannon, PharmD, MBA, BCPS

Background: Create a system framework for a pharmacy internship program with the goal of offering high value experiences and supporting site needs.

Methods: The first step of this project was to have budgeting discussions with system leaders for sites that did not currently have pharmacy interns in their staffing model. With the anticipation of new pharmacy sites to include, a few other tasks were addressed such as updating job descriptions for both pharmacy intern I and II positions, organizing a centralized recruitment model for pharmacy interns, and begin discussions for pharmacy intern system leadership positions. Another key step in this project was to provide a system pharmacy internship manual that each site could utilize. Information within this manual will include general requirements of pharmacy interns, system leadership position descriptions, and training guidance for site responsibilities that leaders may implement. Some final steps of this project include organizing site-specific pharmacy intern information, oversee and guide interns in new leadership positions, and support new pharmacy intern sites as they hire their first round of pharmacy interns.

Results: Prior to this project, 13 of our system's 28 sites employed pharmacy interns. After budgeting discussions occurred, an additional five sites opened pharmacy intern positions resulting in 18 of our 28 sites offering pharmacy intern positions.

For the 2021–2022-year, Advocate Aurora Health (AAH) employed 56 pharmacy interns systemwide. Anticipated number of openings due to graduating pharmacy interns was 16. After budgeting discussions, there was a total of 39 open positions to recruit for. Excluding the open positions due to graduates results with a total of 23 new pharmacy intern positions systemwide for the 2022-2023 year.

Implementation of a centralized recruitment model resulted in a total of 28 applications. Applicants were from seven different pharmacy schools throughout Wisconsin, Illinois, and Indiana.

In progress results of this project include updated job descriptions for pharmacy intern I and II positions, standardized training guidance on site opportunities for pharmacy interns, leadership positions that span across the system, mock interview opportunities for pharmacy interns, and implementation of a centralized recruitment model.

Developing a Framework for Unscheduled Sterile Compounding Technique and Cleaning Assessments at a Teriary Medical

Maxwell W. Stone, PharmD, Kyle Sabol, PharmD, BCPS, BCSCP, Chad Smith, PharmD, MBA, BCPS, BCSCP

Background: Proper aseptic technique is critical to ensure compounded sterile products cause no harm to the patient. The impetus of the project is based on research which shows a decrease in technician aseptic technique knowledge correlated with years of experience and anecdotal feedback from staff about drift in technique with a need for more frequent assessments and reminders. To address technique drift and increase the knowledge base of sterile compounding for applicable staff, tools and procedures were created to supplement the current biannual demonstration competency process for aseptic technique and cleaning during sterile compounding, allowing for more frequent and unplanned assessments.

Methods: To identify gaps in compliance and establish an implementation plan for more frequent testing, we first performed a review of initial and ongoing technician training and education. USP <797> and <800> requirements and Advocate Aurora Health training & remediation standard operating procedures were assessed to identify key components to be incorporated into our assessments. A literature review was performed to find supporting data for the implementation of such a program, and to analyze toolkits and processes already utilized by other health systems. System pharmacy leaders and technicians were introduced to the program and given the chance to give feedback before an initial draft of the tools and process was created and piloted.

Based on feedback, literature review, and current training practices, a first draft of the assessment tools was created. The draft tools were run through pilot trials, and adjustments were made based on initial and ongoing feedback from assessors and technicians. After the trial period, tools and an assessment process were finalized, and a group of technicians were selected as assessors. Technicians were assessed at random with a goal of completing three assessments per week. This serves a larger goal, to complete an unplanned assessment of each compounding technician on technique and cleaning once per six-month period. Assessment data collected was tracked to identify trends and areas in need of further education and training, with the goal of improving techniques and adherence to standard operating procedures. Assessment tools and process will continue to be refined, and assessment completion goals will be re-evaluated for a long-term framework.

Community Acquired Pneumonia: Antimicrobial Stewardship in the Emergency Department

Jasmine M. Berman, 2023 PharmD Candidate, Galina S. Wang, PharmD, Grace C. Mortrude, PharmD, BCIDP

Background: According to the Center for Disease Control (CDC), over 50% of outpatient antibiotic prescriptions are inappropriate and over 30% are unnecessary.1 Overused antimicrobials and inappropriate prescribing leads to adverse outcomes and the development of resistant organisms. The objective of this project was to assess the existing community acquired pneumonia (CAP) order set within the Milwaukee Veterans Affairs (VA) to describe provider prescribing trends in the emergency department (ED).

Methods: This was an observational quality improvement project that included veterans who presented to the ED with a clinical diagnosis of CAP from 05/01/2022-06/30/2022. Patients either had to receive at least one dose of antibiotics at ZVAMC if inpatient or prescribed antibiotics at ER discharge if outpatient treatment. Data collected included the patient's name, social security number, sex, race, ED visit date, serum creatine (SCr) at admission, weight (kg), BMI, estimated creatine clearance (CrCl), pertinent comorbidities, severe penicillin allergies (defined as IgE-mediated anaphylaxis or immediate rash, SJS, TEN, AIN), other antibiotic allergies, legionella urinary antigen obtained, Streptococcus pneumonia urinary antigen obtained, MRSA nares obtained, respiratory culture in previous year with type of microbial growth, recent hospitalization and/or parenteral antibiotics within the last 90 days, respiratory culture obtained and result, antibiotic regimen, appropriateness of antibiotic based on 2019 IDSA CAP Guidelines, duration of antibiotic therapy if outpatient, length of hospital stay, mortality at 30 days, and readmission at 30 days. The results from this project were used to determine adherence to the current CAP order set.

Results: There were 37 patients who met the study criteria out of 101 patients reviewed. Baseline characteristics results include median age (73.16), male sex (100%), Caucasian race (64.8%), median SCr at admission (1.71 mg/dL), median weight in kg (81.99), median BMI (26.92), median estimated CrCl (66.66 ml/min), and median number of comorbidities (2.08). Antibiotic selection per the 2019 IDSA Guidelines considering patient specific factors were appropriate (70.37%) and inappropriate (29.7%) of the time.

Conclusion: The MKE VA ED providers prescribed guideline appropriate therapy 70.37% of the time thus showing a relatively high rate of compliance with some room for improvement. Future directions include updates to the CAP order set and provider education about the CAP order set.

Pharmacogenomics Program Exploration and Feasibility Analysis

James Sullivan, PharmD, Mark Hamm, PharmD, MBA, BCSCP, Mary Walters, PharmD, BCOP

Background: Currently, Advocate Aurora Health (AAH) does not have a centralized program devoted to pharmacogenetic test ordering and application. This project evaluated existing pharmacogenomic (PGx) literature and programs across the country as well as AAH patient demographics and medication use to determine potential patient impact and feasibility of a pharmacy-led PGx program.

Methods: There were two main parts to this project. Part one was a feasibility analysis. A list of 27 clinically meaningful pharmacogenes and 81 affected medications was generated using existing PGx guidelines. This list was compared with allelic frequencies in various patient demographics using Epic Slicer Dicer to estimate the number of patients that may have a clinically actionable pharmacogene. This patient report was then compared with billing services related to PGx test orders, interpretation of test results, and application to determine estimated revenue for the service line.

Part two of this project explored existing PGx service lines through literature review and interviewing the leaders of PGx programs across the country to create a proposed structure for a service line for AAH.

The groundwork this project lays will help the health system understand the potential demands and utilization of a PGx program and the resources needed to meet those demands in a formalized return on investment analysis to be included in the program's business proposal.

Standardization of Inpatient Pharmacy Auxiliary Labels Across a Multistate Health System

Autumn P. Lawhorn, PharmD, Ed Conlin, PharmD, MBA, Emma Hews, PharmD, MBA

Background: Standardizing inpatient pharmacy auxiliary labels is important because it can help to prevent medication errors and improve patient safety. By standardizing inpatient pharmacy auxiliary labels, hospitals can help to ensure that all necessary information is included on the label and that the label is clear and easy to understand. Standardizing inpatient pharmacy auxiliary labels can also help to improve the efficiency of the medication use process and reduce the risk of delays or disruptions. By adopting a consistent format and layout for the labels, healthcare personnel can quickly and easily identify the necessary information and ensure that the correct medication is being administered. This can help to streamline the medication use process and reduce the risk of errors or delays.

Methods: A literature search was performed to explore the existing methods to standardize hospital auxiliary labels. The current auxiliary label inventory from 25 different AAH sites was collected and cataloged according to label type, where they were purchased from, and labels that are used frequently. The current high-alert and look-alike sound-alike medication policy was reviewed and finalized, along with ensuring the auxiliary labels matched the EMR for this subset. Current practice for non-high-alert medication auxiliary labels was assessed for consistency and then trends were presented to pharmacy leadership to aid in finalizing label selection. Once approval is obtained, a standard reference for use will be made and implemented, and the auxiliary label purchasing website will be updated to reflect the new standardized label practice.

Implementation of Pharmacy and Therapeutics Committee Approved Joint Cocktails into the Electronic Health Record for Health System Utilization

Logan Erdmann, PharmD, David Galis, RPh, BCPS, Jessica Moschea, PharmD, BCPS

Background: The Advocate Aurora health system has agreed upon joint cocktail recipes that have not been implemented across hospital sites. The impact of not using a standard order set for joint compounds has led to a delay in pharmacy workflow, incorrect pharmacy compounding of sterile products, and a lack of agreed upon standards in product choice within the system. These confounding variables in combination with the time sensitive nature of the operating room can create medication errors amongst the patient care team. The goal is to provide an order set in the electronic health record for ordering and compounding of joint cocktails through the implementation of a standard joint cocktail list approved by a Pharmacy and Therapeutics Committee.

Methods: The health system had five approved joint cocktail compounds consisting of morphine, epinephrine, ropivacaine or bupivacaine, ketorolac, and saline that were obtained. The key stakeholders were identified within the health system to champion the change to these formulated products. These compounded recipes were then submitted for a medication build request. After approval, the stability of the products was determined by a drug recipe team for storage of the compounded products. The pharmacy informatics teams then built the compound record into the electronic health system to allow for physician ordering and provided pharmacy with the ability to compound and repackage the medications with barcode scanning administration.

Evaluation of the Usability, Engagement, and Value of The Journal of the Pharmacy Society of Wisconsin

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Background: To evaluate the usability, engagement, and value of The Journal following the transition to a fully online open-access format by surveying The Journal's readership.

Methods: Based on past readership surveys, a revised readership survey was developed to determine the ease of use, level of engagement, and overall value of content associated with the open-access format of The Journal. The questions focused on general readability, assessed access to and ease of use of the website, and sought interest in content from The Journal becoming indexed. The survey was composed of 14 questions, with 10 multiple choice questions, three open-ended questions, and one matrix table, created and distributed via Qualtrics Survey Software. The survey was reviewed by The Journal's Editorial Advisory Committee prior to its distribution. A link to the survey and its associated QR code were sent out in the weekly Fast Facts emails to members of the Pharmacy Society of Wisconsin (PSW) and provided to attendees of the PSW Annual Meeting in August 2022.

Results: Thirty-eight PSW members responded to the survey questions, all of whom were readers of The Journal. The results showed that 36 (94.7%) readers were aware of the online journal, 29 (76.3%) found it easy to use, and 36 (94.7%) believed it to be a valuable part of their PSW membership. Readers emphasized their interest in articles focused on original work (84.2%), narrative reviews (76.3%), and continuing education (68.4%). Additionally, 86.5% of readers placed great importance on the content of The Journal becoming indexed in the future.

Conclusion: Online delivery of The Journal has been successful and fairly easy to navigate. While readers find the current content to be valuable, subsequent work should address the need for indexing and allocate more space to original work, narrative reviews, and continuing education in future publications.