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ABSTRACT

2023 ACCP Annual Meeting November 11 - 14, 2023

2022 MERIT PRIMER PARTICIPANTS – COMPLETED RESEARCH

Cardiovascular

Sun-21. MeRIT Project: Effectiveness of SGLT2i in Veterans with heart failure and type 2 diabetes mellitus recently hospitalized for acute decompensated heart failure

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Introduction: Sodium-glucose co-transporter 2 inhibitors (SGLT2i) reduce composite endpoints of cardiovascular death and heart failure hospitalizations (HFH) in patients with heart failure regardless of ejection fraction in randomized controlled trials (RCT). Initiation during HFH has benefit up to 90 days. Longer-term outcomes following HFH using real-world data, including patients potentially excluded from RCTs, are needed to verify effectiveness and safety of SGLT2i.
Research Question or Hypothesis: In patients with Type 2 Diabetes Mellitus (T2DM) and hospitalized from heart failure (regardless of ejection fraction), does the initiation of SGLT2i during admission through 30-days post-discharge reduce heart failure readmissions over 1 year in Veterans?
Study Design: Retrospective cohort study using national VA data comparing patients with T2DM and heart failure, recently discharged due to heart failure exacerbation, who received empagliflozin/dapagliflozin/canagliflozin versus those who were not exposed.
Methods: Adult patients (≥18 years) with T2DM and heart failure treated at VA medical centers for a HFH during CY 2015 – 2022 and at least one outpatient visit within 30 days of discharge were included. The primary outcome was readmission for heart failure within one-year, reported as hazard ratios with 95% confidence intervals for total and propensity-score matched sets. Time to first heart failure re-hospitalization assessed by multivariate Cox-regression hazards model. Safety outcomes reported as means with standard deviations.
Results: Average age 68 years (exposed, n = 449) versus 71 years (unexposed, n = 32057) with over 97% males in both groups. In the exposed group, 54% were started treatment prior to discharge. One-year HF readmissions occurred in 12% in the exposed group versus 25% in the unexposed, HR 0.45 (95% CI 0.34-0.59) for the total cohort and HR 0.43 (95% CI 0.33-0.57) for propensity-score matched groups.
Conclusion: Use of SGLT2i reduced heart failure readmissions when initiated during or early after a HFH.

Critical Care

Sun-23. Variation in use of medications for opioid use disorder in critically ill patients across the United States

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Introduction: Critical care clinicians are increasingly challenged to consider aspects of care unique to patients with opioid use disorder (OUD). Medications to treat opioid use disorder (MOUD: methadone, buprenorphine, and naltrexone) improve outcomes in the outpatient setting but MOUD use practices for patients admitted to the intensive care unit (ICU) are unclear.
Research Question or Hypothesis: How is MOUD being used among patients with a history of OUD admitted to US ICUs?
Study Design: Retrospective, multicenter study.
Methods: The primary outcome was the proportion of patients who received MOUD. Secondary outcomes included MOUD use while receiving invasive mechanical ventilation, hospital day of MOUD initiation, and MOUD use duration. Multivariable logistic regression was used to examine associations between patient- and hospital-level characteristics and MOUD use.
Results: Of 108,189 ICU patients (658 hospitals) with a history of OUD, 20,508 patients (19.0%) received MOUD. Of patients receiving MOUD, 13,745 (67%) received methadone, 2,950 (14.4%) received buprenorphine, and 4,227 (20.6%) received buprenorphine/naloxone. MOUD use while on invasive mechanical ventilation occurred in 37.9% of patients. The median day of MOUD initiation was hospital day 2 (IQR 1-3) and the median duration of MOUD use was 4 (IQR 2-8) days. MOUD use per hospital was highly variable (median 16%, IQR 10-24, range 0-70%); admitting hospital explained 8.9% of total variation in MOUD use. A primary admitting diagnosis of

unintentional poisoning (aOR 0.41,95% CI 0.38-0.45), presence of an additional substance use disorder (aOR 0.70, 95% CI 0.67-0.72), and several factors indicating a greater severity of illness were associated with reduced odds of receiving MOUD in the ICU.

Conclusion: In a large multicenter, retrospective study, there was large variation in the use of MOUD among ICU patients with a history of OUD. These results inform future studies seeking to optimize the approach to MOUD use during critical illness.

Education/Training

Sun-25. MeRIT Project: Determining learning strategies used by successful first-year pharmacy students by applying a positive deviance approach

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Introduction: A new generation of pharmacy students are arriving, students that have always had the internet and affected by COVID-19. Schools want to ensure competent pharmacists upon program completion. The long-term goal of this study is to better understand what enables pharmacy students to be successful by identifying strategies that are transferable.

Research Question or Hypothesis: What learning strategies are used by first-year pharmacy students demonstrating success across 3 dimensions? Aim one is to determine the learning strategies used by successful first-year pharmacy students. Aim two is to describe the student demographics. Aim three is to compare learning strategies across student demographics.

Study Design: This study will utilize a comparative, exploratory mixed-methods study design applying a positive deviance model with purposive sampling.

Methods: Thirty-four first-year pharmacy students were invited to participate in the study. Students completed a survey to provide demographics and success outcomes (P1 grade point average (GPA), Stress, Resilience) data. Students in the lower and upper quartiles on at least one of the success outcomes were invited to semi-structured interviews to discuss learning strategies in first semester of pharmacy school. Interview transcripts will be reviewed to identify common themes. Procedures were IRB approved.

Results: Twenty-five students (74%) provided demographic and success outcome data. The average P1 GPA was 3.38 (Q1: 3.00; Q3: 3.94), the median Perceived Stress Scale was 23 (Q1: 18; Q3: 22), and the median Academic Pharmacy Resilience Scale was 36 (Q1: 34; Q3: 42). Eleven students completed the individual interview. Common themes discovered include scheduling study time (100%), reviewing slides after class(91%), self-created study guides(91%), teaching others (45%), and whiteboarding (18%), among others.

Conclusion: As students transition to graduate curriculum, it is important to be aware of obstacles they may face. Understanding the background of the student is one step for faculty to better prepare for new learners.

Infectious Diseases

Sun-26. Geospatial analysis of extended-spectrum beta-lactamase producing *Escherichia coli* in a mid-sized Midwestern city: Pilot study

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Introduction: Health disparities attributed to race and ethnicity are present in several areas of healthcare, including infectious diseases. Studies have found higher rates of methicillin-resistant *Staphylococcus aureus* infection in black patients, and increased rates of penicillin-resistant *Streptococcus pneumoniae* in Hispanic patients with community acquired pneumonia. There is limited data assessing associations between gram-negative resistance and race, ethnicity, or social determinants of health. One study from the United Kingdom noted an increased rate of extended-spectrum beta-lactamase (ESBL) resistance in areas with crowded housing.

Research Question or Hypothesis: Is there a correlation between ESBL-producing *Escherichia coli* and zip codes that exhibit higher poverty rates or a greater presence of racial and ethnic minorities?

Study Design: Geospatial analysis, observational study

Methods: Three health-systems provide health care services for a mid-sized Midwestern city. These health-systems provided de-duplicated lists of first isolates from patients with a positive *E.coli*, and of patients with ESBL-producing *E.coli* from 2021-2022, divided by zip code. These lists were combined with zip-code level census data from the 2021 American Community Survey. The census data included median household income, percent of residents below the poverty level, and percent of residents from racial or ethnic minorities. Analysis was performed using R software, and the association between each of the covariates and the ESBL rate was assessed using simple logistic regression models.

Results: The ESBL-producing *E. coli* rates were similar across zip codes. There was no statistical association seen with rates of poverty, median income, or percent of racial or ethnic minorities.

Conclusion: There was no association seen between ESBL rates and poverty, income, or percent of residents from racial minorities at the zip code level. Since this is a pilot study, there were a limited number of zip codes included in the analysis. Additional data collection is in progress.

Medication Safety

Sun-24. MeRIT Project: The association of dose compounding procedures and complexity variables with pharmacy technician sterile compounding time and development of a predictive model

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Introduction: Excessive workload for technicians in sterile compounding can impact patient safety and result in repetitive strain injuries and mental burnout for technicians. The variability of compounded dose procedures and complexity has prevented development of workload standards for sterile compounding technicians.

Research Question or Hypothesis: What variables of dose compounding procedures and complexity are associated with compounding time and may be used to develop a predictive model?

Study Design: Sterile compounding observational data for adult patients (September 2022-December 2022) using an IV workflow management system (IV WFMS) from a large academic health system of six hospitals (100–1,000 beds) and eleven outpatient infusion centers.

Methods: Variables of dose compounding procedures and complexity (e.g., number of vials/ampules per dose, need for reconstitution, volume transfer, final volume, final container, batching, high-risk status, stat urgency, and facility size/setting) and compounding time (i.e., time from first manipulation to completed dose) were collected. The association of dose compounding procedures and complexity with compounding time were explored and summarized. Variables found to be associated with sterile compounding time were then used to develop a preliminary model to predict compounding time.

Results: Data analysis includes 114,753 total doses compounded (36,241 stock doses; 78,512 patient-specific dose). Variables of dose compounding procedures and complexity associated with compounding time include: number of vials, whether the dose was a stock dose or made as part of a batch, total volume, size/type of facility (i.e., bed number and inpatient vs. outpatient), first dose, dose difficulty, transfer volume and risk level. A preliminary regression model suggested that these variables explained 60% of the overall variation in sterile compounding time.

Conclusion: Several variables of dose compounding procedures and complexity were associated with compounding time. A preliminary predictive model for sterile compounding time has been developed. Hospitals and other healthcare facilities can utilize this model to better understand the workload of sterile compounding technicians.

Oncology

Sun-22. Targeting anti-apoptotic pathway sensitizes artesunate anti-cancer activity in *KEAP1* loss non-small cell lung cancer

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Introduction: Lung cancer is a leading cause of cancer related deaths. Artesunate (Art) demonstrated anti-cancer activity in established non-small cell lung cancer (NSCLC) cell lines. However, mutations in Kelch-like ECH-associated protein 1 (KEAP1) confers resistance to Art. KEAP1 is known to regulate multiple cellular processes such as oxidative stress response and anti-apoptotic pathways. Furthermore, *KEAP1* loss of function is associated with poor prognosis in NSCLC patients.

Research Question or Hypothesis: Targeting anti-apoptotic pathway sensitives artesunate anti-cancer activity in *KEAP1* loss NSCLC.

Study Design: Preclinical evaluation of anticancer activity of Art-drug combination in NSCLC cell lines, A549 (*KEAP1* loss) and H1299 (*KEAP1* wild type).

Methods: Synergy screening was conducted with several Art-drug combinations. A 6x6 grid method was utilized along with synergyfinder package in R to calculate a ZIP synergy score. CellTiter-Glo 2.0 was used to assess cell viability after 72-hour drug treatment and GraphPadPrism software was used to calculate drug IC50. Protein expressions were assessed with Western blots.

Results: Navitoclax (Nvt), an anti-apoptotic inhibitor, was most synergistic with Art which demonstrated statistically significant mean ZIP synergy scores of 4.37 ($p=0.01$) and 5.35 ($p<0.01$) in A549 and H1299, respectively. Mean Art IC50 combined with 5uM Nvt were 4.22uM (95%CI 3.55-5.02) and 1.62uM (95%CI 1.31-2.00) and statistically significantly different ($p<0.001$ and $p<0.01$, respectively) compared to single agent Art IC50 of 28.7uM (95%CI 25.2-32.6) and 4.31uM (95%CI 3.24-5.74), in A549 and H1299, respectively. KEAP1 expression decreased in both cell lines treated with Art. NQO1 (KEAP1 downstream marker) expression increased only in H1299 treated with Art. MCL-1 (anti-apoptotic marker) expression increased only in A549 treated with Nvt. BCL-xL (anti-apoptotic marker) expression was unchanged in both cell lines.

Conclusion: Art-Nvt combination is synergistic in NSCLC cell lines, regardless of *KEAP1* mutation status. Studies are ongoing to evaluate

efficacy of this combination in xenograft murine models and to determine the mechanism of sensitization.

ADVANCES IN INTERNATIONAL CLINICAL PHARMACY PRACTICE, EDUCATION, OR TRAINING

Education/Training

Tues-36. CLINICAL PHARMACY at MOI UNIVERSITY, KENYA

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Service or Program: The Master's in Pharmacy, Clinical Pharmacy (MPharm), is a 3-year program that admits student with a basic degree in Pharmacy. Right from year one more than 50% of the teaching and learning is undertaken in a clinical set up where students, as part of the larger healthcare team, participate in direct clinical care of patients and rotate in all the major units of the hospital. In their final year students specialize in one of five areas: infectious diseases, non-communicable diseases, hemato-oncology, critical care medicine and therapeutic drug monitoring. Other forms of instruction and learning include didactic lectures, topic discussions, patient case discussions, journal club, grand-rounds and seminars. Students are assessed via written examinations as well as viva voce for patient case management. Students are also expected carry out the research and defend their thesis report.

Moi University is affiliated with Moi Teaching and Referral Hospital, Eldoret, Kenya, the major site for clinical instruction. The MPharm program has received strong teaching support from Purdue College of Pharmacy - Purdue University, Indiana, USA.

Justification/Documentation: Universities in Kenya offer the traditional Bachelor of Pharmacy (BPharm) undergraduate degree whose graduates are best placed to work in Pharmacies (hospital and community) and pharmaceutical industries. With world-wide changes in Pharmacy practice towards enhanced pharmacists' participation in direct care of patients, Moi University sought to meet this need by developing the MPharm program.

Adaptability: The curriculum is reviewed after every 3 years

Significance: The program had its first intake in 2017 with the first student graduating in 2021. A total of 20 students have been admitted as of 2022. Clinical Pharmacists from the program are expected to optimize medication therapy in patients, and promote rational use of drugs that is evidence-based and cost effective.

Sun-54. Clinical pharmacy training using simulated patient: A competence-based education

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Service or Program: A clinical pharmacy training using simulated patients for fourth-year undergraduate pharmacy students at a public university in São Paulo, Brazil. This innovative pedagogical approach was implemented for the Clinical Pharmacy and Pharmaceutical Care course, aligning with the recently established national pharmacy curricular guidelines.

Justification/Documentation: In 2017, Brazil implemented new pharmacy program guidelines, delineating the essential competences for healthcare professionals. Based on these competences, 120 students were organized into groups, with each group being assigned a medical prescription and a corresponding scenario with simulated patients. These simulations encompassed: injectable anticoagulants, inhalation devices, vaginal ovules, suppositories, orodispersible tablets, antibiotics suspension, and eye drops. The students should explain the proper administration technique, indications, potential adverse effects, treatment duration, and storage. Each simulation entailed a unique profile for the simulated patient, including characteristics such as anxiety, multiple complaints, advanced age, hearing impairment, and limited mobility. A clinical pharmacist with experience in both hospital and outpatient settings portrayed the simulated patients. The students expressed that this experience provided an invaluable opportunity to apply their theoretical knowledge in a practical setting, bridging the gap between classroom learning and real-world scenarios.

Adaptability: This activity can be effectively applied to Pharmacy Colleges where clinical pharmacy training is incorporated into the curriculum as they play a pivotal role in shaping the future pharmacists in healthcare. The implementation does not require expensive resources, and it could be used even in low-income institutions with commitment of the educational staff.

Significance: This activity addresses the emerging field of clinical pharmacy services in Brazil. So, simulated patient activities provide a valuable opportunity for students to simulate the role of a clinical pharmacist and gain practical experience in patient care, enhancing clinical competences, patient-centered care, and effective communication.

Emergency Medicine

Tues-47. Improving Compliance of Pain Management Algorithm Among Emergency Medicine Physicians in Emergency Department, Hamad General Hospital, Qatar.

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Service or Program: Pain is one of the top reasons for emergency visits Pain management is one of the most important components in patient care, (ED) is a hyperactive area where a lot of factors may play a role in pain treatment within an acceptable time frame. The use of a standard pain assessment tool and a standard pain management guideline are the key components in achieving a timely and appropriate pain management to each patient, In HGH ED we have Evidence based clinical algorithm (EBCA) pain management guidelines which summarize the treatment options based on the pain score.

Justification/Documentation: observational retrospective audit for adult patients visited HGH ED with acute pain showed that a median of 13% of the patients were appropriately treated according the available EBCA. Surveying the reasons of noncompliance revealed unawareness about the EBCA, difficulty in accessing it and the EBCA wasn't not up to date, this project rational is to update the EBCA and promote for its use.

our aim was to improve the compliance percentage with the acute pain management EBCA in ED to at least 50% from (September -December) 2022 shared with ED leaders.

Adaptability: multiple interventions were done: Results of the audit were also summarized and hanged on ED Clinical pharmacy board in ED, Updated EBCA approved and publish in August 2022, Inservice awareness given to physicians by clinical pharmacists in ED units, clinical pharmacists intervene with pain treatment options to encourage the adherence to the new EBCA.

and as a result of the model of improvement and PDSA cycles we were able to achieve a median compliance of 53% and a monthly compliance more than our target 50%.

Significance: With the collaboration between clinical pharmacy section, ED physicians and ED leadership we were able to update the pain management EBCA, improve the awareness and compliance.

Family Medicine

Mon-74. Incorporating Social Determinants of Health into a Community-Responsive Care Delivery Model: BIGPIC-Jamii

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Service or Program: Our Academic Model Providing Access to Healthcare (AMPATH) Partnership has implemented an evidence-based care model entitled Bridging Income Generation with grouP Integrated Care (BIGPIC-Jamii) in Bungoma County, Kenya. Jamii is Kiswahili for "Family," and signifies our family medicine and community-centered approach. In this model, community members form microfinance (MF) groups. Each group regularly meets to save and loan money in their communities. During these meetings, our mobile and interdisciplinary team of clinicians, pharmacists, social workers, and economic advisers, join the MF groups to provide primary care consultations, subsidized medications, point of care diagnostics, health insurance sensitization, in addition to income generation opportunities.

Justification/Documentation: BIGPIC-Jamii simultaneously integrates clinical care with other Social Determinants of Health (SDOH) needs by addressing barriers such as healthcare and medication access, transportation, and limited financial capital. To date, we have implemented the program to a catchment population of 85,000 people across 17 community units in western Kenya. The program has engaged 5,775 community members, making up 259 MF groups, and circulating >$100,000 in capital. We have screened 3,650 adults for primary conditions including hypertension, diabetes, cervical and breast cancer, and mental health needs. We currently provide community-based primary care management to 631 patients. Additionally, we have sensitized 4,783 households on the importance of health insurance and have successfully enrolled 1,500 households.

Adaptability: This innovative community-based care model has gained traction amongst neighboring sub-counties within Kenya. While our immediate goal is to scale BIGPIC-Jamii to other communities in Kenya, aspects of the program are being adapted to similar settings in Guyana, India, and the US.

Significance: The BIGPIC-Jamii model is an evidence-based intervention that has demonstrably improved clinical, social, and financial outcomes in previously published studies. There is an urgent need to demonstrate scalability and sustainability of such model and to expand its benefits to additional resource-constrained populations globally.

Oncology

Tues-92. Assessing the impact of a clinical pharmacist on inpatient monoclonal antibody medications for oncologic use at a public urban teaching hospital

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Service or Program: The Hematology/Oncology pharmacy service at a 627-bed public urban teaching hospital in Brooklyn, New York sought to decrease unnecessary and/or inappropriate administrations of non-emergent monoclonal antibody therapy for oncologic use in inpatient admissions with the inclusion of a clinical pharmacist. An example of this would be a patient scheduled for a monoclonal antibody with discharge pending in 2 days. A clinical pharmacist was added to the Hematology/Oncology team in July 2021. Interventions included reviewing for appropriate indication, recommendation to administer in the outpatient setting, inpatient discharge in greater 7 days resulting in need for a subsequent dose, and expected survival in less than 30 days.

Justification/Documentation: Cancer treatment costs are increasing; the global cost of antineoplastic medications rose to $83.7 billion in 2015. The addition of targeted monoclonal antibody medications has improved cancer treatment, but has also contributed to increases in cancer costs. As a result, it is imperative for institutions to implement cost-saving strategies. Prior to implementation of a clinical pharmacist, the use of 37 inpatient monoclonal antibodies for inpatient use cost $243,575.40. Post-implementation of a clinical pharmacist, the use of 4 inpatient monoclonal antibodies for inpatient use cost $28,719.24. This was a decrease in 33 administrations and a cost reduction of $214,856.16.

Adaptability: The addition of a clinical pharmacist-led recommendations for inpatient monoclonal antibody use can be implemented to other healthcare systems. The recommendations, in collaboration with Hematology/Oncology providers, led to appropriate medication usage and decreased inpatient medication costs.

Significance: The program was implemented at a large public urban teaching hospital, primarily consisting of a diverse patient population living in a low socioeconomic area. Thus, implementing these cost saving initiatives improves the quality of care that is offered to all patients. The roles of the clinical pharmacist demonstrated to be integral in prioritizing patients that need therapy in the inpatient settings.

Other

Sun-101. Multicenter Global Point Prevalence Survey of Antimicrobial Use Among Hospitals in Guatemala

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Service or Program: Standardized protocols set forth by Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS) were used to record antimicrobial consumption data and several quality indicators from 4 local hospitals in Guatemala. The surveys were conducted by team composed of pharmacists, infection control nurses, and physicians and then validated by the assigned site coordinator. The antibiotic data was then categorized according to the 2021 World Health Organization (WHO) AWaRe classifications to help identify antibiotic use trends in the various wards of the hospital.

Justification/Documentation: After reviewing 1177 patient charts, there were 642 (54.5%) patients prescribed at least one antimicrobial. From the 1082 total prescriptions, 957 (88.4%) were systemic antibiotic prescriptions with carbapenems, penicillins with beta-lactamase inhibitors and 3rd generation cephalosporins (17.9%, 14.1% and 11.3% respectively). Many of the antibiotics prescribed were in the WHO Watch category creating concern for rising antimicrobial resistance (AMR) and development of multidrug resistant organisms (MDRO). As one of the first cross-sectional Global-PPS studies conducted in Guatemala, a goal was to the provide direction for future category use targets such as decreasing Watch category prescriptions.

Adaptability: This multicenter review of antimicrobial prevalence in Guatemala ranged from tertiary to specialized referral centers demonstrating the ease of the Global-PPS being a web-based application to collect antimicrobial data. The ability to compare the collected data at an international level allows this process to repeated at other institutions globally who are looking to make improvements to their antimicrobial stewardship programs (ASPs).

Significance: With the increasing rise MDROs, particularly carbapenem resistant *A. baumannii* and third generation cephalosporin-resistant *E. coli* in Guatemala, it is imperative to conduct studies like this to observe the baseline antimicrobial use after implementation of ASPs, which can guide the design of future interventions and move towards institution standardized guidelines to better support hospital staff.

Sat-46. Development of an Approach to Counseling on Short-Term Experiences in Global Health Utilizing Health Literacy Tools

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Service or Program: Pharmacy faculty and students provided medication counseling to patients during interdisciplinary medical clinics as part of a short-term experience in global health (STEGHs) throughout the Dominican Republic. Health Literacy Tools (HLTs) are recommended by the Agency for Healthcare Research and Quality to increase patient understanding of health information but have not been considered for STEGHs. The pharmacy team developed a counseling approach which utilized the teach back method, World Health pictograms with translated labels, interpreters, and encouraging questions to counsel patients. A thirteen-question survey was developed to determine which method(s) was deemed useful by patients.

Justification/Documentation: STEGHs are commonly utilized to provide care in remote areas throughout the Dominican Republic, but as far as we know, no studies have evaluated best practices or utilizing HLTs to provide medication counseling in a culturally and linguistically appropriate manner in these settings. This service was developed as a pilot for a STEGH from 01/06/23-01/14/23 to counsel over 350 patients.

Adaptability: Utilization of HLTs in a STEGH medical clinic pharmacy may provide appropriate counseling tools for patients with cultural and linguistic barriers. Utilization of all methods, except for interpreters, are free of charge and can easily be implemented into a pharmacist role for medication counseling on a STEGH. Pre-departure planning for creating pictogram/translated medication labels can also be developed, while interpreter costs can be built into a budget.

Significance: The use of counseling methods on STEGHs has not been previously evaluated. This program may represent the utility of multiple counseling methods on STEGHs where cultural and language differences are present. Utilization of a variety of HLTs used in pharmacy counseling during a STEGH may be necessary and preferred by non-English speaking patients.

CASE REPORTS

ADR/Drug Interactions

Tues-3. Intravenous ferric gluconate associated adverse drug reactions: a case series

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Introduction: Intravenous (IV) iron products are widely used for iron repletion, and all products are associated serious hypersensitivity reactions including anaphylactic-type reactions. Newer formulations, such as sodium ferric gluconate (SFG), are reported to be safer than iron dextran with fewer than 1% of patients experiencing reactions precluding further administration.

Case: During a 5-week span with 159 administrations, six IV SFG doses resulted in serious adverse reactions (3.8%). Every patient received SFG 250mg in 100mL of 0.9% sodium chloride administered over 60 minutes. Five patients experienced an infusion-related reaction with the first dose of IV SFG, and the sixth patient experienced a reaction upon receiving the third dose. Four patients required escalation of care including initiation of vasoactive agents or transfer to intensive care. Medications administered included: IV diphenhydramine (5) corticosteroids (4), famotidine (4), fluid bolus (3), intramuscular epinephrine (2), initiation or uptitration of vasopressors (2), inhaled racemic epinephrine (1), and albuterol nebulizations (1). Additionally, a non-rebreather, emergent intubation, and intra-arterial balloon pump placement were required in one patient each. Four patients tolerated subsequent doses of IV iron sucrose without complications.

Discussion: The use of IV SFG resulted in rates of serious adverse events similar to that of IV iron dextran at our institution. The use of IV SFG is largely documented in patients with kidney disease with maximum doses of 125mg given IV push or over 30 – 60 minutes, which was a lower dose than administered to our patients. Additionally, three of our patients had extensive cardiovascular disease and all patients were acutely ill, which represent a population not evaluated in the current literature.

Conclusion: Higher than expected severe adverse drug reactions occurred after the administration of IV SFG during hospital admissions. Further studies are needed to determine if IV SFG administration is safe for indications other than kidney disease.

Sat-2. Midodrine Induced Scalp Pruritus and Paresthesia: A Case Report

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Introduction: Pruritus and paresthesias caused by midodrine, while reported in the literature, are rarely identified by clinicians in practice although midodrine is commonly used to manage ICU and intradialytic hypotension. We report a case of a patient who experienced profound pruritus and paresthesias following the administration of midodrine.

Case: A 35-year-old Hispanic female with a history of end stage kidney disease who presented with lightheadedness and low blood pressure was admitted for worsening hypotension after hemodialysis. The patient was given 10 mg of midodrine prior to hemodialysis, which she had never received before. She reported experiencing severe itching and tingling of the scalp that traveled downward through her trunk, including bilateral arms and wrists, 15 minutes after receiving midodrine. The patient also described feeling extremely anxious during the reaction and expressed fear of experiencing a similar sensation if midodrine were to be administered again. The reaction resolved in 30 minutes without treatment.

Discussion: Although pruritis and paresthesias (especially of the scalp area) have been reported in the midodrine package insert, it is rarely seen in practice. A retrospective review of 87 patients at The University of Texas Southwestern Medical Center found no documented cases of this adverse effect. In this case, pharmacy was involved in the investigation of the reaction and determined it was most likely attributable to midodrine. The proposed mechanism is potentially related to the alpha-1 receptor agonism of midodrine, causing contraction of muscles responsible for piloerection.

Conclusion: Healthcare providers must be vigilant of the potential adverse effects of midodrine as they are capable of causing significant discomfort, severe enough to deter the patient from further administrations. Strategies to avoid the adverse effects of midodrine may

include reducing the dose and employing other methods to combat hypotension.

Adult Medicine

Mon-10. The development of angiotensin II receptor blocker-associated angioedema in a patient with history of angiotensin-converting enzyme inhibitors associated angioedema: a case report

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Introduction: Angioedema is a rare condition precipitated by several medications including angiotensin-converting enzyme inhibitors (ACE-I) and less commonly, angiotensin II receptor blockers (ARBs). The use of ARBs after ACE-I-associated angioedema is considered safe and encouraged in certain guidelines.

Despite the lower risk with ARBs, a patient could redevelop angioedema. There is a paucity of data regarding the risk of ARB-induced angioedema and previous exposure to ACE-I. Our case contributes to the limited evidence regarding this serious adverse effect.

Case: A 71-year-old Caucasian female presented to the emergency room with hives progressing to throat swelling determined to be angioedema. A CT scan revealed the patient had submucosal edema in bilateral aryepiglottic folds. Valsartan was stopped and the patient received intravenous methylprednisolone, diphenhydramine and famotidine.

The patient had a history of angioedema secondary to lisinopril. One day after lisinopril discontinuation, valsartan 80 mg daily was initiated and six days later increased to 160 mg daily. After 168 days of valsartan, angioedema redeveloped.

The patient's symptoms rapidly improved and she was discharged on hospital day 2. Her valsartan was not resumed, and the patient denied any further symptoms on follow-up twelve days post discharge.

Discussion: Our patient's valsartan-associated angioedema (Naranjo Scale 5) followed a history of lisinopril-associated angioedema. Although rare, ARB-associated angioedema may be more likely to occur if the patient has had previous ACE-I associated angioedema. Other cases have reported angioedema to occur soon after dose titration or ACE-I conversion. After our patient experienced lisinopril-associated angioedema, they immediately started valsartan, and received therapy for months before developing recurrent angioedema. This information widens possible timelines of ARB-associated angioedema in patients with a history of ACE-I associated angioedema.

Conclusion: ARBs can cause angioedema in patients with history of ACE-I induced angioedema. This medical condition can reoccur regardless of the timeline of starting the ARB or undergoing dose titration.

Ambulatory Care

Sun-79. Periodontal disease treatment associated with reduced insulin requirements in a patient using concentrated U-500 regular insulin: A case report

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Introduction: There is a link between periodontal disease and diabetes mellitus (DM), though the impact on glycemic therapy is less clear. This case highlights the significant impact dental disease can have on insulin requirements and adds to data supporting the role of clinical pharmacists (CP) on the care team.

Case: FB is a 64-year-old male followed by a CP for management of Type 2 DM. His hemoglobin A1C has down-trended from 10.1% to 8% over 10 months with subsequent total daily dose (TDD) of U-500 insulin incrementally increased from 265 to 405 units/day. FB reports pain under his lip and has not seen a dentist in 15 years. The CP requests a dental hygienist assessment who finds signs of abscess with multiple fractured teeth. Three teeth are extracted at an emergency dental visit. One week later, FB endorses 9 episodes of hypoglycemia with blood glucoses (BG) ranging from 43 – 63 mg/dL despite eating normally. The CP reduces his TDD of insulin by ~14%. One-week later, FB reports normalized BG with no episodes of hypoglycemia using a TDD of 345 units/day.

Discussion: Few have studied the impact of periodontal treatment on A1c, finding potential to lower A1c slightly; though none have described a need to decrease insulin. Strong teamwork, swift identification and treatment, along with close follow-up led to positive patient outcomes. Even though this is one case-example, it is clear that dental hygienists and clinical pharmacists can and should work collaboratively to provide team-based quality care for persons with diabetes.

Conclusion: Providers should be aware of fluctuating insulin requirements that may occur after periodontal disease treatment. Clinical pharmacists within the integrated care team can provide significant benefits to patients with diabetes complications.

Cardiovascular

Sat-11. Title: Pharmacologic Management of Chagas Cardiomyopathy Cutaneous Reactivation Two Months After Heart Transplantation

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Introduction: Chagas disease, caused by Trypanosoma cruzi, is endemic to Latin America but now globally encountered. If untreated in the acute phase, T. cruzi persists within human cells. 20-30% of

infected persons develop chronic Chagas cardiomyopathy, with some requiring heart transplantation. Reactivation of Chagas disease may occur in heart transplant patients on immunosuppressive therapy. Benznidazole, an inhibitor of T. cruzi DNA, RNA, and protein synthesis, is the first line therapy for reactivation of Chagas disease post-transplant. Complicating the treatment is the need to titrate medications to safely achieve recovery.

Case: A 60-year-old El Salvadoran man with a heart transplant for Chagas cardiomyopathy on tacrolimus, mycophenolate, and prednisone was evaluated for abdominal wall induration and left knee erythema. Trypanosomes were histologically identified on skin biopsy. Inpatient oral benznidazole 5 mg/kg every 12 hours was started after obtaining the medication from a facility in Boston. Due to a concomitant bacterial infection, mycophenolate was held and the tacrolimus goal trough range was reduced from 12-15 to 10-12 ng/mL. The tacrolimus dose was initially reduced by 50% and its levels monitored daily given potential benznidazole-tacrolimus interactions. Tacrolimus levels dropped to below target range, and the dose needed gradual upward adjustment. Cutaneous Chagas disease reactivation resolved after 60 days of benznidazole, with nausea and weight loss as the main adverse effects

Discussion: Because azole antifungals inhibit the metabolism of tacrolimus, thereby increasing its blood levels, it is imperative to consider that similar effects may occur with other azole agents such as benznidazole. Tacrolimus itself can decrease benznidazole excretion, leading to higher serum levels and more adverse effects. Tacrolimus levels can vary during benznidazole therapy, necessitating frequent dosage adjustments.

Conclusion: Benznidazole treats cutaneous Chagas disease reactivation after transplantation, but its complex interactions with tacrolimus mandate close monitoring of tacrolimus levels and associated adverse effects of both drugs.

Mon-41. Use of Prasugrel Post-Percutaneous Coronary Intervention (PCI) in a Patient with a History of Transient Ischemic Attack (TIA): A Case Report

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Introduction: Dual antiplatelet therapy (DAPT) with aspirin and a $P2Y_{12}$ inhibitor is recommended in patients with acute coronary syndrome (ACS) or post PCI to prevent stent thrombosis. Prasugrel is contraindicated in patients with history of stroke/TIA and not recommended in patients 75 years or older or weight <60 kg. This case report describes prasugrel use in a 76-year-old Veteran with history of TIA.

Case: A 76-year-old male with a history of heart failure (HF), ACS, coronary artery bypass surgery, peripheral arterial disease, and TIA presented with non-ST elevation ACS. The patient underwent PCI receiving three drug eluting stents. Within days of starting DAPT (aspirin and ticagrelor), he reported rash, blisters, and itching, subsiding three days after self-discontinuation of ticagrelor. Prior pharmacogenomic testing revealed CYP2C19 *1/*2 diplotype, deeming him an intermediate metabolizer and therefore poor candidate for clopidogrel. Cilostazol was briefly considered but ruled out because of its HF contraindication. After a comprehensive risk/benefit discussion with the patient, he consented to prasugrel.

Discussion: Prasugrel is more effective than clopidogrel/ticagrelor in reducing cardiovascular morbidity and mortality in patients with ACS undergoing PCI. However, patients aged 75 years or older are at increased risk of fatal and intracranial bleeding with the risk of intracranial hemorrhage significantly increased in patients with a history of stroke/TIA. Given our patient's extensive cardiovascular history and recent stents, concerns regarding clopidogrel efficacy, and inability to tolerate ticagrelor, patient-centered shared decision making led to the use of prasugrel despite these risks. This patient has tolerated prasugrel for four months without any issues.

Conclusion: Prasugrel use in patients 75 years and older and/or with history of stroke or TIA or weight <60 kg should generally be avoided. However, it may be considered in extreme cases when DAPT is warranted without alternatives.

Mon-38. Efficacy of Rectal Dual Antiplatelet Therapy (Ticagrelor/Aspirin) After Percutaneous Coronary Intervention in a Post Surgical Patient: A Case Report

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Introduction: A 63-year-old female with a complicated past medical history presented with hematemesis and chest pain. Electrocardiogram (EKG) findings were consistent with posterior STEMI. The patient received two drug eluting stents to the proximal and distal circumflex with aspirin 325mg and clopidogrel 600mg loading doses.

Case: In the intensive care unit, CT imaging findings of free air consistent with viscus perforation, prompted an emergent surgery consultation. Surgical intervention showed duodenal perforation proximal to the ligament of Treitz, requiring partial duodenectomy and end-to-end anastomosis. Enteral access for medication or nutrition was contraindicated post-operatively. Recent stent placement necessitated further antiplatelet therapy to prevent acute stent thrombosis. Eptifibatide was considered high-bleeding risk, and other IV antiplatelet agents

were not in supply. Rectal aspirin and ticagrelor were started, and patient was closely monitored with telemetry, serial EKGs and by P2Y12 levels to assess for treatment response to her dual antiplatelet therapy (DAPT). The patient's P2Y12 level 48 hours after rectal ticagrelor loading dose was 8 PRU (194-418PRU); subsequent P2Y12 level monitoring showed continued suppression, with levels ranging from 40-70PRU. The patient eventually had return of bowel function and was transitioned to enteral nutrition and medications including her DAPT.

Discussion: Rectal DAPT was initiated to mitigate the risk for in-stent thrombosis and balance the risk for repeat GI bleeding following her duodenal rupture. P2Y12 levels were monitored as a proxy to measure therapeutic drug efficacy, with P2Y12 levels orally and rectally showing similar findings within the 40-70PRU range. While rectal clopidogrel was considered, in-vivo biotransformation would be missed with rectal administration.

Conclusion: While rectal aspirin has been studied for patients with acute coronary syndrome, rectal routes of other antiplatelet agents have not been widely studied. Our case suggests in the uncommon circumstance, rectal absorption is a viable temporary option for patients who otherwise have limited enteral access.

Community Pharmacy Practice

Mon-13. Pharmacist collaboration identifies and facilitates treatment of an unusual presentation of diabetes insipidus with reset osmostat in a young adult male: A case report

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Introduction: A community pharmacist identified persistent, severe hypernatremia in a young, asymptomatic adult male, AE, through an employee health program. Despite expressing concern to AE's original endocrinology team, no diagnostic or treatment intervention for hypernatremia was documented. When the original endocrinology practice closed, the community pharmacist referred AE to an academic medical center via an endocrinology pharmacist. A collaborative relationship formed between the pharmacists, facilitating an increased flow of vital information regarding AE's course of treatment and history.

Case: AE's history (2018-2023) revealed sodium 160-180mEq/L, serum osmolality 330-356mOsm/kg. The community pharmacist provided detailed lab histories to the new endocrinology practice. Upon initiating care, AE was immediately advised to present to the hospital for admission. AE was resistant to hospitalization due to medical cost fears and lack of symptoms; however, both pharmacists collaborated to convey the importance of finding an accurate diagnosis. Due to hypernatremia, adipsia, and reset osmostat, AE was diagnosed with mixed-picture diabetes insipidus (DI). During admission, thiazide and vasopressin challenge were completed, with AE discharged after five days with a thiazide prescription and water intake goal. Upon discharge, the endocrinology pharmacist communicated discharge instructions, and the community pharmacist reinforced through education and monitoring.

Discussion: The patient's socioeconomic status and health literacy were barriers in self-advocacy. Direct pharmacist-to-pharmacist collaboration was key to successfully connecting AE with the endocrinology and nephrology teams to identify his mixed picture DI. This communication also led to the discovery of relevant health history that AE did not understand to disclose. AE's case is evolving, and the pharmacists continue relaying information successfully, increasing patient understanding and reducing barriers to treatment.

Conclusion: Pharmacist collaboration was key to the identification, treatment, and ongoing management of AE's condition. Optimization of pharmacist-to-pharmacist communication across disciplines and institutions should be prioritized to improve patient care.

Critical Care

Sun-45. Amiodarone Induced Refractory Thyroid Storm Utilizing Single Pass Albumin Dialysis (SPAD): A Case Report

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Introduction: Thyroid storm (TS), an urgent complication resulting from excessive thyroid hormone activity, carries a high risk of mortality. Single-pass albumin dialysis (SPAD) has shown promise in managing severe thyrotoxicosis. SPAD employs albumin as a dialysis solution to eliminate excess thyroid hormones from the bloodstream.

Limited literature exists on SPAD's application in TS. We present a case report of an elderly male with multiple co-morbidities experiencing TS and the successful utilization of SPAD during his hospitalization.

Case: A 75-year-old male with an extensive past medical history including coronary artery disease, ischemic cardiomyopathy with reduced ejection fraction (EF 20%), atrial fibrillation recently initiated amiodarone, presented to the emergency department with concerns for decompensated heart failure.

Labs revealed suppressed thyroid-stimulating hormone (TSH) and elevated free T4 hormone levels and a diagnosis of amiodarone-induced thyroiditis was made. Amiodarone was discontinued, and treatment with oral methimazole, lugol's iodine, hydrocortisone, and propranolol initiated.

Despite maximal medical management, the patient's condition deteriorated to refractory TS. A decision was made to initiate SPAD to achieve an euthyroid state as a bridge to decision or thyroidectomy.

SPAD was performed using an existing continuous renal replacement therapy (CRRT) circuit and dialysate containing 3% albumin. The patient underwent multiple SPAD sessions and showed consecutive improvement in thyroid function tests but with a lag in clinical improvement. Despite achieving an euthyroid state, the patient suffered a cardiac arrest due to ventricular tachycardia.

The patient's condition continued to deteriorate and ultimately, given progressive multi-organ failure resulting from shock, the patient passed away.

Discussion: Although an unfortunate patient outcome in this case, the improvement in thyroid function due to SPAD shows promise for treatment of TS and should be further studied to find optimal therapy.

Conclusion: Amiodarone induced TS can be successfully treated with SPAD. Knowledge gained in this experience can guide future treatment in refractory TS.

Emergency Medicine

Sun-61. Peptide receptor radionuclide therapy (PRRT)-induced carcinoid crisis: A case report

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Introduction: Carcinoid crisis is a rare, life-threatening, difficult to recognize complication associated with neuroendocrine tumors. We discuss a case of known cardiac carcinoid syndrome, progressing to carcinoid crisis, potentially stemming from prior treatment with peptide receptor radionuclide therapy.

Case: Our patient was a 65-year-old male with a new diagnosis of metastatic stage IV ileal neuroendocrine tumor and cardiac carcinoid syndrome. Chemotherapy was started after diagnosis, in addition to peptide receptor radionuclide therapy. Approximately two weeks after initiating chemotherapy, the patient presented to the emergency department with persistent nausea, vomiting, diarrhea, worsening palpitations, and skin flushing, concerning for carcinoid crisis. The patient was initiated on amiodarone and octreotide infusions, admitted to the hospital, but ultimately expired.

Discussion: The increasing use of peptide receptor radionuclide therapy has contributed to increases in carcinoid crisis, specially in high-risk patients. The presentation of carcinoid crisis is highly variable, rare, and unpredictable with no consensus on an appropriate definition or diagnostic criteria. Patients with carcinoid crisis often present to the emergency department, making recognition and timely management critical. Therapeutic management of crisis largely consists of octreotide infusion, intravenous fluids, corticosteroids, and correction of electrolyte disturbances. While these strategies are currently the mainstay of crisis management, there are no consensus-based guidelines for management.

Conclusion: Our patient was at high risk of developing carcinoid crisis, and his presentation was consistent with other case reports describing this condition. This case adds to the growing literature supporting carcinoid crisis as a complication of peptide receptor radionuclide therapy. As this therapy continues to be used as a mainstay of neuroendocrine tumors, emergency department providers are likely to encounter this cancer-related emergency more often. Timely recognition is critical, and further research should be directed at better understanding the pathophysiologic mechanisms responsible for carcinoid crisis to reach a consensus on definitions, diagnostic criteria, and goal-directed treatment strategies.

Infectious Diseases

Tues-75. A Case Report of *Cronobacter sakazakii* Pneumonia Post-automobile Injury

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Introduction: *Cronobacter sakazakii*, formerly known as *Enterobacter sakazakii*, is a Gram-negative, motile, facultative anerobic bacteria. It is an opportunistic foodborne pathogen and commonly found in contaminated dried infant formula. *C. sakazakii* infections are rare in immunocompetent individuals, but a few cases have been reported in neonates and older adults (> 55 years). Thus, we described a unique case *of C. sakazakii* ventilator-acquired pneumonia post-automobile injury.

Case: A 21-year-old Caucasian male presented to the emergency department with severe traumatic brain injury (TBI) with multiple intracranial hemorrhages and bilateral lung contusions after suffering a rollover automobile collision. Patient underwent multiple surgeries to repair extensive facial and extremities injuries. Patient had worsening leukocytosis (WBC 15,000 cells/μL) with thick tan pulmonary secretions with extensive multifocal bilateral lung infiltrates seen in a chest computed tomography (CT). A bronchoalveolar lavage (BAL) culture was positive for *C. sakazakii* and methicillin-susceptible *Staphylococcus aureus*. The patient was initiated on cefepime 2g IV q8h extended infusion for 14 days, after which the pneumonia resolved. Subsequently, patient was transferred to a long-term acute care facility.

Discussion: To our best knowledge, our patient is the first reported case of *C. sakazakii* in an immunocompetent adult host with traumatic brain injuries who developed ventilator-acquired pneumonia. The pathogenesis of *C. sakazakii* remains unclear. Fortunately, *C. sakazakii* grows well on routine culture media and microbiological laboratories

can detect *C. sakazakii* from blood or cerebrospinal fluid (CSF) samples using molecular testing methods. Although our case of *C. sakazakii* was highly susceptible to most antibiotics, there have been reports of the resistance in extended-spectrum penicillins, first-third generation cephalosporins, and fluoroquinolones.

Conclusion: Although *C. sakazakii* has been commonly associated with severe neonatal infections, delayed treatment in adults can result in morbidity and mortality. Due to conflicting reports of resistance profiles, a paradigmatic antimicrobial treatment for *C. sakazakii* remains to be established.

Neurology

Mon-104. A case report of elevated bromide levels from pyridostigmine bromide for treatment of myasthenia gravis

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Introduction: Elevated bromide levels can cause neurological abnormalities. There is a paucity of data describing bromide toxicity from high doses of pyridostigmine bromide (PB). This case describes a patient with an elevated level from a therapeutic dose of immediate release PB.

Case: A 37-year-old male with a type B2 thymoma status post thymectomy complicated by myasthenia gravis presented in myasthenic crisis with dysphagia, difficulty breathing, and neck flexion weakness. He required mechanical ventilation for seven days and was treated with intravenous immunoglobulin, steroids, PB and subsequent plasmapheresis. On day nine he experienced acute agitation. He was physically and verbally aggressive. The patient had a low anion gap=2 mEq/L, chloride=109 mEq/L, and albumin=4.5 g/dL. All other laboratory values were normal. The daily dose of PB was 660 mg and bromide toxicity was high on the differential. On day 10 his bromide level was 37 mg/L (normal<0.5 mg/L), drawn 4-hours after a 90 mg dose. His agitation was initially managed with quetiapine followed by PB dose reduction to 360 mg/day.

Discussion: To our knowledge there are two cases of bromide toxicity secondary to PB. These patients experienced agitation, confusion, paranoid delusions, visual hallucinations, and coma with levels of 88–90 mg/L (toxic levels>50–100 mg/dL). The NMS Labs reports concentrations >12 mg/L increases the risk of electroencephalogram disturbances. While our patient's bromide level was not as high as those previously reported, there was no other obvious cause of his agitation. We did not obtain a repeat bromide level on the lower PB dose which is a limitation. Hyperchloremia, a low or negative anion gap, or acute neurological changes while on PB warrants obtaining a bromide level and consideration of lowering the PB dose.

Conclusion: Elevated bromide levels from therapeutic PB can occur and monitoring of levels should be considered.

Sun-94. Wernicke's Encephalopathy and Serotonin Syndrome: A Case Report of Overlapping Pathologies

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Introduction: Acute encephalopathy is a common symptom encountered in critically ill patients, and may be associated with Wernicke's Encephalopathy (WE) or serotonin syndrome (SS). We describe a patient who presented with clinical manifestations of both WE and SS and who responded to treatment for both pathologies.

Case: A 56-year-old male presented after being found unresponsive and in a questionable tonic-clonic state. Past medical history was significant for depression managed with fluoxetine 20 mg by mouth daily and alcohol abuse. Initial imaging did not support an acute neurologic process, though the patient was found to be shivering profusely on arrival. A physical exam revealed the following abnormalities: severe clonus in the bilateral lower extremities; diffuse hyperreflexia along with akinesia on the left upper extremity; ophthalmoplegia; and persistent tachycardia despite pharmacologic interventions. The patient's daughter indicated that the patient had been taking his fluoxetine three times per day rather than daily as prescribed. Oral cyproheptadine at a 12 mg initial dose followed by 4 mg every 6 hours for a total of six doses was administered. Similarly, a thiamine regimen of 500 mg IV every 8 hours in addition to folic acid 1 mg IV every 24 hours was initiated to treat WE. Physical symptoms of both WE and SE resolved within 48 hours and the patient was ultimately discharged to home in stable condition.

Discussion: The clinical diagnosis of both WE and SS in this case is supported by the Caine and Hunter criteria, respectively, as well as the resolution of symptoms with accepted treatment modalities for each.

Conclusion: It is important for clinicians to be cognizant of potential overlapping pathologies when patients present with non-specific symptoms, especially acute encephalopathy, in the intensive care unit.

Pharmacoeconomics/Outcomes

Tues-107. Hyper-responsiveness to Warfarin in A Young Patient with The VKORC1 -1639GA/CYP2C9*1*46 Genotype:A Case Report

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Introduction: Warfarin is the most widely used oral anticoagulant; nevertheless, dosing of warfarin is problematic for clinicians worldwide. Inter-individual variability in response to warfarin is attributed to genetic as well as non-genetic factors. Pharmacogenomics studies have identified variants in CYP2C9 and VKORC1 genes as significant predictors of warfarin dose, however, phenotypes of rare variants are not well characterized.

Case: We report a case of hyper-responsiveness to warfarin in a 22-year-old outpatient with Crohn's disease who presented with a swollen, red, and painful left calf. Deep venous thrombosis (DVT) in the left lower extremity was confirmed via ultrasonography, and hence, anticoagulation therapy of heparin and concomitant warfarin was initiated. Warfarin dose of 6.6 mg/day was estimated based on IWPC algorithm. Higher than the expected international normalized ratio (INR) value of 4.5 necessitated the reduction of the warfarin dose, to 5 and eventually to 2.5 mg/day to reach a therapeutic INR value of 2.6. Pharmacogenetic profiling of the VKORC1 **-1639G>A** and CYP2C9 ***2, *3, *4, *5, *8, *14, *20, *24, *26, *33, *40, *41, *42, *43, *45, *46, *55, *62, *63, *66, *68, *72, *73** and ***78** revealed a VKORC1-1639GA/CYP2C9*1*46 genotype. The lower catalytic activity of the CYP2C9*46 (A149T) variant was previously reported in *in vitro* settings.

Discussion: CD *per se* and concomitant azathioprine are expected to increase warfarin dose requirements in our case patient. Intriguingly, our patient attained high INR at standard dose of warfarin, which could have predisposed him to serious bleeding. Due to the failure of non-genetic factors guided warfarin dose prediction, it was rational to investigate the underlying genetic factors that may elucidate this patient's hyper-responsiveness to a standard dose of warfarin.

Conclusion: This is the first report on a case of warfarin hyper-responsive phenotype of a patient with the heterozygous CYP2C9*1*46 polymorphism.

Pharmacokinetics/Pharmacodynamics/Drug Metabolism/Drug Delivery

Sun-117. Novel Drug Interaction Between Gamma-Cyclodextrin (Sugammadex) and Amantadine Leading to Oculogyric Crisis: Case Report

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Introduction: With the advent of nanoparticle molecular delivery systems, it is crucial to acknowledge that novel, but clinically relevant drug interactions remain to be discovered. Thus, it is important to proactively evaluate theoretical drug-drug relationships to mitigate any associated adverse drug reactions in clinical scenarios.

Case: A 49-year-old-man with autism was initiated on electroconvulsive therapy (ECT) for medication-refractory catatonia. Relevant past medical history included catatonia that was worsened by neuroleptics, complicated by benzodiazepine-induced respiratory failure, but repeatedly improved with amantadine. He was initially admitted on scheduled lorazepam 1 mg thrice daily. During ECT-1 (day-5), while intubated and sedated, he was receiving the following psychoactive medications: amantadine 200 mg twice daily, lorazepam 2.5 mg (total), and continuous dexmedetomidine. No sugammadex was administered. For all ECT sessions, he received rocuronium and methohexital at similar doses. Following ECT-2 (day-7), sugammadex was administered and he was later extubated with dexmedetomidine discontinuation. Psychiatry recommended continued lorazepam down-taper, which was discontinued the next day (day-8). Relative to ECT-1/-2, ECT-3 utilized twice the electric charge. Post ECT-3 (day-10), following sugammadex administration, he was soon found to be acutely dystonic. Exam revealed tachycardia, rigidity, and abnormal motor movements, which consisted of oculogyric crisis, cogwheeling, fingers contracting towards the palms, and perioral twitching. Intravenous diphenhydramine 25 mg given 6 hours later did not significantly improve symptoms. Electroencephalogram, though limited due to artifact from constant eye and head movements, was negative for epileptiform activity. Sugammadex was held, amantadine was further up-titrated, and the patient slowly improved.

Discussion: *In vitro*, cyclodextrin molecules display high binding association constants with amantadine moieties, creating potential clinical implications. During ECT-3, absent sedation/benzodiazepines, he was predisposed for acute dystonia secondary to sudden dopaminergic withdrawal following sugammadex-related amantadine removal.

Conclusion: Sugammadex-amantadine's likely physiochemical interaction in this case's context warrants further research in both laboratory and clinical models.

Substance Abuse/Toxicology

Mon-127. Use of Fomepizole with N-Acetylcysteine in an Acute Acetaminophen Overdose: A Toxicology Case Report

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Introduction: N-acetylcysteine is used in acetaminophen toxicity to prevent acetaminophen-induced liver injury. The use of N-acetylcysteine is considered standard of care. The addition of fomepizole to N-acetylcysteine has been supported only through case reports and animal studies. This case supports emerging evidence regarding the initiation of fomepizole with N-acetylcysteine and subsequent fomepizole dosing in an acute acetaminophen overdose.

Case: A 33-year-old male presented to the emergency department with stable vital signs (GCS 13), able to follow one-step commands with significant prompting. The patient endorsed a benzodiazepine overdose but was unable to discuss any co-ingestions. The patient's acetaminophen level was elevated (398 ug/mL), liver enzymes and coagulation labs were within normal limits. Four hours after N-acetylcysteine initiation and a one-time fomepizole dose (15 mg/kg), the acetaminophen level remained elevated at 372 ug/mL and 276 ug/mL after eight-hours. All other labs remained within normal limits.

Fomepizole (15 mg/kg) was re-dosed 14.5-hours after initiation of N-acetylcysteine. After 38-hours of therapy and an acetaminophen level of < 10 ug/mL, N-acetylcysteine was discontinued. The patient returned to baseline with a GCS 15 and all laboratory values within normal limits.

Discussion: Previous case reports demonstrate the addition of fomepizole to N-acetylcysteine in the setting of a massive ingestion or severely elevated acetaminophen concentrations (>500 ug/mL). This case demonstrates initial fomepizole use in an unknown ingestion size and repeat dosing in moderately elevated acetaminophen levels. Fomepizole was successfully added to prevent progression to acute liver injury, demonstrated by lab values remaining within normal limits. The hepatoprotective properties of N-acetylcysteine with fomepizole should be further explored, evaluating initial combination therapy and subsequent dosing parameters.

Conclusion: Animal studies and case reports have demonstrated the addition of fomepizole as a hepatoprotective agent in acetaminophen toxicity. This case adds fomepizole may be administered as initial and as adjunct therapy to prevent acetaminophen-induced liver injury.

Transplant/Immunology

Tues-126. A Novel Use of Carfilzomib for Antibody-mediated Rejection in Multivisceral Transplantation: A Case Report

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Introduction: Antibody-mediated rejection (ABMR) leads to generation of plasma cells and antibodies, increasing the risk of graft failure. Emerging data with proteasome inhibitors (PIs) show potential in ABMR through plasma cell apoptosis. Differences exist between the available agents (bortezomib/carfilzomib) in side effect profile and proteasome binding duration. We report the first use of carfilzomib for ABMR in a multivisceral transplant (MVTx) recipient.

Case: A 21-year-old MVTx recipient presented with a chief complaint of nausea, vomiting, and diarrhea. They had a history of gastroschisis requiring intestinal transplant (ITx) in 2010 (failed from rejection) and underwent MVTx (liver/pancreas/intestine) in 2016. Intestinal biopsies revealed cellular rejection and presence of class II donor-specific antibodies (DSA), which prompted treatment with methylprednisolone, anti-thymocyte globulin, plasmapheresis, intravenous immunoglobulin, and two doses of bortezomib. A month later they were still unable to tolerate enteral feeds and biopsy re-demonstrated ABMR with newly positive C4d staining and increased DSAs. Plasmapheresis and intravenous immunoglobulin were restarted with the addition of carfilzomib for five doses. After completion, DSAs down-trended and biopsy showed no rejection and negative C4d staining. Over the following months, DSAs rebounded and biopsy-proven rejection returned, ultimately leading to graft failure and patient death.

Discussion: This report details the novel use of carfilzomib for ABMR in MVTx. Data with carfilzomib is limited to two case series in lung transplant ABMR, with inconclusive findings on graft function and antibody response. For MVTx recipients, there is only one published use of a PI (bortezomib) for early ABMR in ITx that resulted in long-term DSA suppression, however this was not seen in our patient with late ABMR. We hypothesize that the timing of ABMR diagnosis may play a role in PI efficacy.

Conclusion: Carfilzomib may be used in multimodal treatment of ABMR in MVTx with short-term positive results. More data is needed for late ABMR after MVTx.

CLINICAL PHARMACY FORUM

Ambulatory Care

Mon-39. Leveraging the electronic medical record to implement of Single Maintenance and Reliever Therapy (SMART) in a primary care setting

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Service or Program: Recent guideline changes recommend the use SMART with a single combination inhaler of an inhaled corticosteroid and formoterol in patients with moderate to severe asthma to decrease exacerbations. The clinical pharmacy specialists in the Primary Care Medicine Clinic (PCMC) at Barnes-Jewish Hospital developed educational resources and screening tools to implement updates. Handouts were created and distributed to physicians detailing changes and how to properly order SMART therapy. Patients with active albuterol prescriptions and scheduled for appointments in the

upcoming week were screened through reports generated by the electronic medical record (EMR). Patient's inhaler refill history, insurance, and hospitalizations were reviewed. Patients with Medicaid and one or more hospitalizations due to asthma in the past year or uncontrolled on current inhalers as evidenced by albuterol refills of 3 or more in a 6-month period were selected for evaluation.

Justification/Documentation: Overuse of short acting beta agonists (SABA) is a risk factor for poor asthma control and severe exacerbations. Messages were sent to physicians detailing a patient's course of condition and recommendations for implementation of SMART. If SMART was prescribed, the PCMC Pharmacy team would educate the patient at the upcoming visit. The pharmacists were able to follow up with education and implementation timely by targeting patients with upcoming appointments.

Adaptability: Pharmacists and pharmacy students were involved in screening patients. This process may be applied to any outpatient setting with EMR reporting tools and could be modified to fit any guideline directed change.

Significance: Approximately 80 patients were screened between June and July 2022 and 20 patients were identified as candidates for change. This highlights the impact clinical pharmacists can have on implementing guideline therapy on a large number of patients in a short time period. Including learners in the process provided an opportunity for a greater impact than would be seen with traditional chart review.

Sun-11. Implementation and Impact of a Clinical Pharmacist-Led Patient Engagement and Adherence Program on Outcomes

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Service or Program: Chronic diseases lead to significant morbidity and mortality. Clinical pharmacist-led teams and technologies should be leveraged to improve health outcomes for patients with chronic disease states. This clinical pharmacy-driven network focuses on patient engagement and improving medication adherence in patients with chronic diseases, is currently available nationwide, and provides patient-centered care using clinical workflow and data management systems. This program was developed and delivered by clinical pharmacists to enhance patient engagement, as well as identify and resolve medication adherence concerns through combining analytics, individual case review, and pharmacist-led patient outreach with the goal of optimizing health outcomes.

Justification/Documentation: This was a multicenter, retrospective, observational, pilot analysis of patients with recorded quantifiable measures from Central Texas over 12 months. Descriptive statistics were utilized to compare patients pre- and post-enrollment in the network. The primary objectives were to evaluate potential reductions in chronic disease control measures, medication adherence performance, and cost savings. The engagement and adherence programs were evaluated in a total of 12,158 patients. Following enrollment in the networks, improvements in uncontrolled rates of A1c and systolic blood pressure (SBP) were observed (A1c: 35% to 12%; SBP: 45% to 22%). Medication adherence increased between six to eight percentage points across three medication-related measures (diabetes mellitus, hypertension, dyslipidemia), while 21-32% savings in healthcare expenditures per member per month were seen.

Adaptability: Although this pilot evaluation was only conducted on patients from Central Texas, this process is available nationwide. Clinical pharmacists can engage with patients remotely and thus this program is easily adaptable to any area or patient across the country. Program success is dependent on the clinical pharmacists' ability to proactively engage patients.

Significance: Clinical pharmacist-driven services can be implemented and leveraged to improve chronic disease control measures and adherence, while reducing healthcare expenditures, to optimize patient care.

Critical Care

Sun-41. Anti-Xa Monitoring for Enoxaparin Prophylaxis: A Process Improvement Initiative

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Service or Program: Guidelines recommend serum factor anti-Xa (anti-Xa) concentration monitoring with enoxaparin chemoprophylaxis dose-adjustment in trauma patients. Pharmacy consultation was established in 2019 for enoxaparin chemoprophylaxis management in ICU and floor patients at a level 1 trauma center. Programmatic elements included a collaborative practice agreement, anti-Xa ordering, enoxaparin dosage adjustment, daily monitoring, and progress note documentation. A baseline evaluation demonstrated 56.5% of anti-Xa trough concentrations were appropriately drawn. A pharmacist-led process improvement (PI) initiative using the Institute for Healthcare Improvement Model for Improvement was undertaken to improve anti-Xa serum monitoring reliability.

Justification/Documentation: An interprofessional stakeholder analysis identified and assembled a team of physicians, nurses, phlebotomists, information technologists, and pharmacists. "Go Sees", high level process mapping, Failure Modes Effects Analysis, Pareto chart, and root cause analysis (RCA) were performed. Over 80% of process

failures occurred due to anti-Xa assays not being collected as ordered. RCA identified discordant awareness between assay collection and the medication administration record (MAR) with variation between floor (phlebotomy draw) and ICU (nurse draw) systems. Iterative Plan-Do-Study-Act cycles were performed for assay timing, assay order communication, and MAR comments in both environments. MAR comments entered by clinical pharmacist visually signifying lab due time paired with the respective enoxaparin dose was the most reliable intervention. Over the 3-month period of the project, appropriate anti-Xa collection increased from 45% to 77% for floor patients and 50% to 83% for ICU patients.

Adaptability: Pharmacist-driven, lab-medication linked signifier on the MAR enhanced reliability of appropriately drawn anti-Xa assays for trauma patients. This initiative demonstrated positive feedback from stakeholders, including pharmacists' desire to implement similar workflow improvements necessitating timed serum laboratory monitoring for pharmacotherapy.

Significance: Pharmacists fulfill ACCP clinical practice standards by facilitating the care delivery process through collaborative practice agreements for enoxaparin chemoprophylaxis. Pharmacist-led, interprofessional PI can improve key drivers across pharmacy and non-pharmacy workstreams.

Education/Training

Sun-49. Description of a Shared Clinical Site-Based Faculty Model

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Service or Program: We describe a model in which two faculty members share an inpatient clinical service of 44 patients with autonomy to structure time on-site vs off-site as needed throughout the month. Alternating as preceptor of record each month, both are often present throughout the month and share clinical APPE students (up to 24 annually) and residents (up to 6). This model was developed in discussions between faculty, the pharmacy practice chair, and hospital pharmacy administration.

Justification/Documentation: With increasing workload on both the clinical and university sides, especially with the addition of an online pharmacy program, faculty were having difficulty balancing workload. This clinical workload adjustment allows individual faculty to maintain a full-time position, have more control over protected time in an inpatient clinical setting, and still maintain a high-level clinical service.

Adaptability: This model is sufficiently generalized for adaptation. To be successful, paired faculty should demonstrate clear communication, a similar patient care approach, and be willing to utilize a joint rotation syllabus and other rubrics/documents. The benefit to this practice model is the ability to adopt this model without making major shifts in all faculty models or significantly affecting non-faculty clinical pharmacy colleagues. Ongoing assessment will be via learner evaluations and feedback.

Significance: This model is a unique opportunity for faculty to have autonomy over their clinical schedules and to be able to help provide for more sufficient time to engage in university responsibilities and scholarly activity. By working together with another faculty member, student rotations will have more continuity and consistency with the faculty having close communication while also benefiting from combined faculty experiences. Flexible scheduling minimizes the need for non-faculty precepting of students as well as cross-coverage for other pharmacists for PTO coverage. Overall, we anticipate this model that increases protected time will improve co-funded faculty satisfaction and result in less burnout.

Tues-80. The Role of a Visiting Clinician Scholar in Pharmacist-Managed Cardiovascular Risk Reduction Clinics

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Service or Program: A Visiting Clinician Scholar (VCS) program has been implemented at the Purdue University College of Pharmacy in partnership with pharmacy schools and other collaborators in Colombia. Through this program, Colombian pharmacists and pharmacy students participate in clinical experiences in ambulatory care and community pharmacy.

Experiences in cardiovascular risk reduction clinics (CVRR) enable the VCS to improve their skills in clinical pharmacy, as well as their confidence while speaking English and precepting students.

Justification/Documentation: Pharmacist-managed CVRR services are offered in seven different federally qualified health centers at Eskenazi Health in Indianapolis, Indiana. CVRR pharmacists care for more than 150 patients per site. Under the supervision of clinical faculty preceptors, the VCS is responsible for delivering care for people with diabetes, hypertension, and dyslipidemia. The VCS supports pharmacists in a variety of ways including: providing language concordant care for Spanish-speaking patients, sharing insight about clinical pharmacy services offered in Colombia, and creating resources to facilitate more effective patient communication.

Adaptability: Clinical pharmacists have the opportunity to implement and scale the VCS program model beyond CVRR sites. Foundational

relationships have also been established in Colombia for potential expansion to other practice sites or health systems.

Significance: The VCS program allows for bidirectional academic, clinical, cultural, and linguistic learning that demonstrates mutual benefit for VCS program participants, faculty preceptors, pharmacy students, and patients. CVRR pharmacists working with VCS program participants have the opportunity to improve their ability to communicate with Spanish-speaking patients, contributing to accessibility and equity in health care. The VCS program also opens doors for Colombian pharmacists and students, such as additional training opportunities, expanded network of pharmacy colleagues, and enhanced English-language fluency.

Sun-50. Pediatric Advanced Life Support Training Course for Pharmacists

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Service or Program: Our institution created a Pediatric Advanced Life Support (PALS) simulation course for pharmacists. The course was developed by pharmacy leadership specializing in both pediatrics and emergency response. It consists of an interactive electronic education session and a hands-on activity in a simulation center. It is offered to pharmacists reporting to PALS activations. Activities during the course include learning what equipment and medications are in the code cart and where to find them, reviewing common medication doses, utilizing dosing guides and tools in the code cart to aid in preparing medications and practicing closed loop communication.

The goal of the course is to enhance comfort in the following areas:

1. Attending a pediatric code activation
2. Knowledge of pediatric code activation policies and procedures
3. Dosing pediatric medications
4. Preparing pediatric medications
5. Interacting with pediatric code activation team

Justification/Documentation: A 2022 Root Cause Analysis identified that PALS certified pharmacists at our institution did not feel prepared when reporting to a PALS activation. The recommended solution was to implement a course to provide pharmacy-specific skills training in order to fill the gaps of pharmacist confidence and knowledge during PALS activations. A quality improvement project looking at the first cohort of participants found that comfort on a 5-point scale in five measured areas (listed above) increased by at least one point from baseline following the course.

Adaptability: Any institution with potential PALS activations could benefit from a similar program. The content and applied skills are applicable to most patients under 50 kg in weight.

Significance: At institutions with PALS activations, all PALS certified pharmacists would benefit from ongoing hands-on programming. Newer employees would also benefit from initial hands-on training as they work on gaining real-life experience.

Mon-61. Incorporating a Flipped Research Model into a Longitudinal Advanced Pharmacy Practice Experience

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Service or Program: Challenges to student research success during Advanced Pharmacy Practice Experience (APPE) include unfamiliarity with research processes, time to learn EHR systems, IRB delays, and more, all resulting in delays accomplishing meaningful research projects. Based on the results of a SWOT analysis and literature search, a flipped research model was implemented within a six-month Longitudinal APPE (LAPPE) program to alleviate research challenges with a goal of student success in research completion.

Justification/Documentation: A SWOT (strengths, weaknesses, opportunities, and threats) analysis of the traditional research model was conducted within a LAPPE program to identify possible improvements for the research component. Additionally, a literature search was completed to identify other research formats. Based on these results, a comprehensive flipped research timeline and structure was developed for the LAPPE. To date, one pair of LAPPE students completed the flipped model. This allowed for a completed project and poster prior to ASHP Midyear with manuscript completion at the end of the APPE year. Additionally, an IRB-approved project has been initiated for the incoming LAPPE students. The flipped model allowed students to develop research skills and enhance residency preparedness.

Adaptability: The flipped research model is unknown in the context of student research as all present examples are within residency programs. Implementing a flipped model with our comprehensive timeline and checklist has high potential for other LAPPE programs given the tighter time restraints and other challenges to research as compared with residency programs.

Significance: The flipped research model represents a novel method of introducing LAPPE students to high caliber research. The flipped LAPPE research model favors a streamlined IRB approval process in addition to the opportunity to complete data collection early when students have more time. This model has positioned students to achieve numerous goals including residency-readiness, poster presentation, manuscript publication, and to be co-authors on a subsequent project.

Emergency Medicine

Mon-70. Novel Glucagon Access Program (HEED the GAP) at an Urban Academic Emergency Department

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Service or Program: HEED the GAP is a pharmacist led Emergency Department initiative at UI Health. It identifies and provides glucagon to patients at risk of hypoglycemia, especially those with Diabetes Mellitus (DM) on hypoglycemic medications. This initiative is an adaptation of UI Health's Naloxone access program. In this initiative, an ED pharmacist identifies at-risk patients via ED tracking board. They approach eligible patients, provide information on usage and effectiveness of glucagon, demonstrate administration of the intranasal (IN) or intramuscular (IM) formulation and offer glucagon bedside

Justification/Documentation: In 2018, there were 242,000 ED visits and 60,000 hospital admissions for hypoglycemia in DM patients. Glucagon is a life-saving, self-administered medication that is highly effective in treating severe hypoglycemic event. However, glucagon uptake has been low in patients living with DM, due to previous formulation issues. A nationwide study demonstrated decreased glucagon fill rates among adult DM patients between 2011 and 2021. UI Health ED pilot data demonstrated that only 3% of adult patients with hypoglycemia between 2016 and 2018 were prescribed glucagon. The glucagon access program initiative at UI Health was designed to improve access to glucagon and reduce hospital admissions in the DM population.

Adaptability: There are several considerations for adapting this labor intensive, grant funded initiative to other EDs. Leveraging the Electronic Medical Record to automate identification of at-risk patients can help integrate the initiative into ED workflow seamlessly. Identification of resources to offset medication costs can ensure sustainability of the initiative.

Significance: DM is the second most frequent chronic disease among ED patients and EDs serve as safety nets for vulnerable populations with poor access to care. Glucagon access programs in EDs can reduce ED and hospital utilization in populations at risk of hypoglycemic events.

Geriatrics

Mon-76. Polypharmacy Intervention in Hospitalized Older Adults

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Service or Program: Polypharmacy and use of potentially inappropriate medications (PIMs) in older adults is associated with poor outcomes, increased healthcare utilization, and higher costs. Hospitalization represents an opportunity to reduce polypharmacy and PIMs, improving medication safety. Through a quality improvement framework, a polypharmacy intervention was developed for hospitalized older adults (age≥65). A layered learning model of Pharm. D. Candidates, PGY-1 pharmacy residents, and attending pharmacotherapy specialists conducted a comprehensive medication review at admission to identify medication therapy problems (MTPs), identify PIMs using validated criteria, and provide pharmacotherapy and deprescribing recommendations. The intervention was piloted on one internal medicine/geriatric service at an academic medical center over six months to evaluate effectiveness and determine scalability.

Justification/Documentation: Comprehensive polypharmacy deprescribing assessments were provided to 162 patients. Polypharmacy occurred in 98.7% of older adults, whereas 55.7% received a PIM. This demonstrates a significant need for a targeted intervention to address polypharmacy and PIMs during hospitalization. A median of 2 MTPs were identified per patient, the most common being adverse drug reaction (30.7%), medication without indication (22%), and indication without medication (22%). Opioids were the most common PIM (45.6%), followed by benzodiazepines (14%) and sulfonylureas (12.3%). There was no change in the median number of home medications from admission to discharge (11 vs. 12). 43% of recommendations were implemented.

Adaptability: The intervention can be readily applied by pharmacotherapy specialists within a general medicine service, with or without a layered learning model. Training on PIMs and polypharmacy is encouraged. Integration with medication reconciliation, discharge counseling, or transitions of care teams would improve efficiency and may increase implementation. Identification and application to the target populations is facilitated with simple reporting tools.

Significance: This polypharmacy intervention positions pharmacotherapy specialists and learners to optimize care via a deprescribing framework. Using hospitalization as a key touchpoint is novel but has challenges due to transitions of care.

Hematology/Anticoagulation

Sat-35. Transition of blood factor product care from blood bank to the pharmacy at West Virginia University Hospitals

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Service or Program: The transition of care of blood factors to the pharmacy allows clinical pharmacy involvement with products including Factor VIII, Factor VIII/von Willebrand Factor Complex, Factor IX, Factor VII, antithrombin, and prothrombin complex concentrate, mainly within emergency rooms and intensive care units or elective surgeries for patients with bleeding disorders like hemophilia A or B and von Willebrand disease. Previously at West Virginia University Hospitals, hematology fellows in the blood bank managed all blood factor products with no pharmacy involvement. The development of this program included addition of a benign/hematology clinical pharmacist, formulary reviews, budget impact analyses, guideline development, and operational standardization. Continuing education, operational presentations, required case-based learning, and nurse- and physician electronic handouts were incorporated for education purposes.

Justification/Documentation: Several safety concerns exist with medications not being managed by clinical pharmacists. Previously, products were used with no clinical oversight and follow up regarding appropriate choice or switching of agents. Products were being used inappropriately in patients without bleeding disorders or on prior anticoagulation triggering development of restriction criteria depending on the dosing frequency, indication, and cost. Collaboration with the EPIC Willow team allowed for minimization of safety events such as naming conventions, access to resources, and optimization of the orders through radio buttons. Measurement of success is generated through dashboards created to monitor usage, appropriateness, and cost management to improve patient care.

Adaptability: This initiative provides guidance for other health systems to develop pharmacy involvement in institutions that utilize their blood bank for blood factor products with limited pharmacy integration.

Significance: Blood factor management by pharmacy allows for more judicious use of these products as pharmacists are uniquely positioned to provide safe, appropriate, and cost-effective use by thoroughly reviewing medication histories and providing clinical services. Involvement with blood factor utilization will significantly improve patient care and enhance the hospital system budget.

Infectious Diseases

Mon-28. Frontline Pharmacist Fluoroquinolone Prospective Audit and Feedback Program

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Service or Program: Local inpatient fluoroquinolone (FQ) use guidelines for treatment of urinary tract infections, pneumonia, skin-soft tissue infections and diabetic foot infections were developed. In June 2019, a prospective audit and feedback (PAF) process was implemented for the clinical pharmacist at time of order verification. Pharmacists contacted the prescriber and recommended an alternate agent based on the infection or contraindications according to local FQ guidelines.

Justification/Documentation: The FDA advised restricting FQs in treatment of uncomplicated infections when risks of side effects outweigh the benefits. FQ use has been high at our institution. According to local antibiogram, FQ susceptibilities to *Escherichia coli*, *Pseudomonas aeruginosa* and *Proteus mirabilis* were low and empiric use was not recommended. In 2017, "Inpatient Fluoroquinolone Use" pocket cards with guidelines were developed, distributed, and education was provided to inpatient resident medical teams. Education efforts alone were not sufficient to impact use. This PAF process addressed needs to decrease FQ prescribing.

FQ days of therapy (DOT) per 1000 patient days have decreased [57-(2017), 55-(2018), 28-(2019), 23-(2020), 20-(2021), 22-(2022)].

Ciprofloxacin susceptibility has increased for *Escherichia coli* [74%-(2017), 79%-(2018), 73%-(2019), 80%-(2020), 81%-(2021), 82%-(2022)], *Pseudomonas aeruginosa* [80%-(2017), 80%-(2018), 80%-(2019), 86%-(2020), 80%-(2021), 85%-(2022)], and *Proteus mirabilis* [63%-(2017), 76%-(2018), 69%-(2019), 72%-(2020), 81%-(2021), 83%-(2022)].

Adaptability: The FQ-PAF program was pharmacist-driven on all shifts. The antimicrobial stewardship pharmacist (ASP) provided education regarding the guidelines and FQ-PAF. The process is readily adaptable to other medications or disease states in order to improve medication management and optimize patient outcomes. It also demonstrates an easily implemented ASP intervention as required by The Joint Commission Standards.

Significance: Clinical pharmacists had a direct impact on optimizing antimicrobial use for patient care with the FQ-PAF. The program successfully decreased FQ-DOT. Additionally, it may have impacted the antibiogram and increased the possibility of FQs being an option when a FQ is the preferred antimicrobial treatment.

Managed Care

Sat-42. National pharmacy care management program for a self-funded employee health plan: Preliminary total cost of care reduction

Elaine Bedell, Pharm.D., BCPS[1], Ashley Van Allen, Pharm.D., BCACP[2] and Mary Beth Rottman, Pharm.D., BCACP, CSP[3]

(1)Ascension, Austin, TX (2)Ascension, Issaquah, WA (3)Ascension, Newburgh, IN

Service or Program: A multicenter non-profit health system (Ascension) established a centralized pharmacy care management service for its employee health plan with approximately 200,000 covered lives. Ten pharmacists (10 FTEs) and two pharmacy technicians

(2 FTEs) provide telephonic medication support for members through medication adherence outreach, medication therapy management (MTM), and chronic medication management (CMM) services.

Proactive outreach targets members with multiple chronic disease states and medications, or a Proportion of Days Covered (PDC) less than 80% however, all plan members are eligible and encouraged to contact the team directly.

Pharmacists and technicians operate in 13 states and are licensed in states they support. The team has access to the local electronic health records as well as population health software. Additionally, the team has access to the local pharmacy dispensing software and case management software.

Justification/Documentation: 3,172 patients received an outreach during the initial pilot July to December 2022. Preliminary total cost of care (TCC) was reduced by 19% for the patients receiving an intervention compared to those not receiving an intervention, producing a preliminary reduction in TCC of $12.7M.

TCC is anticipated to continue to decrease as the team is in place for the full plan year of 2023 and contributing to additional interventions. Additionally, this team focuses on patients with multiple chronic conditions and medications therefore, opportunity to integrate care for further TCC consolidation exists.

Adaptability: This project is applicable to community pharmacies and ambulatory clinics that provide Medication Adherence, MTM, and/or CMM services. Organizations can customize contracts, especially with self-funded employee plans, to provide this type of pharmacy care for members.

Significance: Comprehensive pharmacy services provided demonstrate the value to improved patient outcomes, and also to the reduction in the total cost of care by 10% on average per patient per month.

Sat-41. Pharmacy technicians impact on medication adherence for medicare advantage star ratings: preliminary data

***Elaine Bedell, Pharm.D., BCPS*[1] and Stephen Foust, Bachelor of Science[2]**

(1)Ascension, Austin, TX (2)Ascension, Nashville, TN

Service or Program: Ascension, a nonprofit health system and second largest system in the US, established a centralized national pharmacy team for multiple Medicare Advantage plans in three (3) markets with approximately 59,000 covered lives. Five pharmacy technicians (5 FTEs) provided proactive telephonic outreach targeting members with a Proportion of Days Covered (PDC) less than 90% who were receiving medications for diabetes, hypertension, or cholesterol. Medicare Advantage star rating of four stars or above was determined as the goal to achieve contract requirements for financial incentives based on quality and performance.

March 1, 2023 the team began accessing plan claims data to identify members meeting criteria for outreach. A telephonic outreach was conducted if indicated after reviewing additional medication information in the local electronic health record.

Justification/Documentation: 6,437 patients were outreached by June 1, 2023 with a 22% contact rate. 67% of patients contacted received a refill and 25% were converted to 90 day fills. The most common barriers to patients refilling medications on time were setting up refills, forgetting to take medications, and medication cost. Pharmacy technicians were able to assist with removing these barriers to improve medication adherence.

With the achievement of four stars, a total of $21.6M additional funding would be earned based on plan contracts. Medication adherence is estimated to contribute 20% ($4.3M) of the overall stars rating based on each of the three measures being triple weighted. Pharmacy technician staffing expenses are $284K annually.

Adaptability: This program is applicable to any entity serving patients covered by Medicare Advantage plans.

Significance: Medication adherence measures are triple weighted metrics and a key strategy to improve Quality Star ratings for value based contracts . Utilizing pharmacy technicians to remove barriers and facilitate medication refills provides support to achieving the goal of an overall four star or above rating.

Medication Safety

Mon-40. Implementation of local mitigation strategies to combat medication shortages and state Medicaid coverage changes

Sue Lee-Chuu, Pharm.D., BCPS[1], *Rachel Howland, Pharm.D., BCPS*[2] and Christine Kelso, Pharm.D., BCPS, AE-C[3]

(1)Barnes Jewish Hospital, St Louis, MO (2)Barnes Jewish Hospital, Maryland Heights, MO (3)Barnes-Jewish Hospital, St. Louis, MO

Service or Program: The clinical pharmacy specialists at the Primary Care Medicine Clinic (PCMC) at Barnes-Jewish Hospital monitor for drug shortages and state Medicaid changes that would impact patients. The PCMC is a large, academic internal medicine clinic that serves up to 190 patients daily. Pharmacists reviewed patients' charts, identified affected patients, and contacted providers with alternative recommendations to minimize delays and gaps in medication therapy. Additionally, providers were notified through a memo using an SBAR format. Examples of recent initiatives include glucagon-like peptide-1 agonist, albuterol nebulizer solution, and varenicline drug shortages, and Missouri Medicaid's restriction of gabapentin dose and short-acting beta agonist inhaler refills.

Justification/Documentation: Medication shortages are surging in the United States and have been associated with negative economic and clinical outcomes to patients. Patients are at risk for increased out of pocket expenses, adverse events, and dissatisfactions during medication shortages. Implementing local mitigation strategies can help minimize adverse outcomes and inconvenience affecting both health professionals and patients. For example, 722 patients were screened for gabapentin dose restriction change in February 2023 and 91 patients were identified needing provider actions and recommendations were sent to their providers prior to the roll out of restriction in April 2023.

Adaptability: Recent updates on drug shortages and discontinuations were obtained through the FDA website and the institution's drug shortage committee. Medicaid website was referenced for coverage updates. The electronic medical record reporting tool was used to identify patients based on prescribed medication and insurance coverage if applicable. Patient list obtained from the report was used for review and proactive measures highlighted above. This process may be applied to any inpatient and outpatient setting in the health system.

Significance: Vigilant monitoring of drug shortage and coverage updates and proactive measures present opportunities for pharmacists to reduce barriers to continued medication therapies and ensure proper transitions of care.

Sun-82. Clinical Pharmacists and Limited Distribution Specialty Medications - Bridging the Gap

***Shellie Fravel, Pharm.D., BCPS*[1] and Lama Noureddine, MD[2]**

(1)Department of Pharmacy Practice and Science, University of Iowa, Iowa City, IA (2)University of Iowa Hospitals and Clinics, Iowa City, IA

Service or Program: Jynarque (tolvaptan) is the only FDA approved medication for the treatment of Autosomal Polycystic Kidney Disease (ADPKD). Due to risk of liver injury, adherence to a Risk Evaluation and Mitigation Strategy (REMS) involving routine liver function test monitoring is required. Additionally, the medication is only available through a restricted distribution program. Designated Jynarque specialty pharmacies ensure that prescribers document REMS adherence prior to dispensing, however, the burden of collecting and reviewing laboratory data falls on the prescriber. Although our institution's specialty pharmacy performs monitoring services for medications they dispense, they are not permitted to dispense Jynarque given the limited distribution polices. As such, we developed a Jynarque pharmacy consult service to allow tolvaptan prescribing nephrologists to employ pharmacy services for Jynarque monitoring. In addition to monitoring, patients receive medication counseling and the opportunity to discuss concerns with the pharmacy specialist at each monitoring follow-up.

Justification/Documentation: Within three years of initiating the consult service, 21 patients have initiated tolvaptan. Prior to the service, routine prescribing of tolvaptan did not occur at our institution. In 2022, our institution was named a PKD Foundation Center of Excellence, noting the presence of an ADPKD clinical pharmacy expert as key criteria for awarding the designation.

Adaptability: Clinical pharmacy services can be utilized at institutions servicing patients with ADPKD to ensure access and safe use of Jynarque. Outside of ADPKD, proactive identification of opportunities for clinical pharmacists to perform monitoring services for high-risk specialty medications with restricted distribution is important so that limited distribution of medications does not limit patient access to necessary therapies.

Significance: Clinical pharmacists are uniquely trained to perform medication monitoring for high-risk specialty medications. Recognition of the need for clinical pharmacy services in creation of health care policy and service payment models for limited distribution specialty medications is critical.

Nephrology

Sun-83. The Advancing Kidney Health through Optimal Medication Management (AKHOMM) Curriculum: Preparing Pharmacists to Provide CMM in Nephrology

Rebecca Maxson, Pharm.D., BCPS[1], Calvin Meaney, Pharm.D., BCPS[2], Joanna Hudson, Pharm.D.[3], Marisa Battistella, Pharm.D.[4], Katie E. Cardone, Pharm.D., BCACP, FNKF, FASN, FCCP[5] and Wendy St. Peter, Pharm.D.[6]

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Service or Program: The AKHOMM program aims to accelerate implementation of comprehensive medication management (CMM) services across the U.S. to ensure every person with kidney disease receives CMM through team-based care including a pharmacist (kidneymedicationmanagement.org). AKHOMM works toward this goal through development of a curriculum for pharmacists and a learning and action collaborative to aid nephrology practices in incorporating pharmacy services. In spring of 2023, AKHOMM's first curriculum launch was an innovative multidisciplinary continuing education (CE) course that includes 18 modules based upon practice and post-graduate education standards for nephrology pharmacists published by AKHOMM in 2022 and includes core topics in nephrology and health disparities to help develop a nephrology clinical pharmacist workforce.

Justification/Documentation: Patients with chronic kidney disease (CKD) have complex medication therapy problems and do not routinely receive CMM. Recent advances in medications that slow CKD progression coupled with new value-based payment models and recognition of disparities in kidney care increase the need for nephrology trained clinical pharmacists. There is currently a void in nephrology-specific post-graduate training programs for pharmacists.

Adaptability: This novel CE course is designed for busy practitioners to increase their knowledge and skills through 30-minute videos that include interactive elements and questions to assess knowledge. Practitioners can select CE modules based on their educational needs. Modules can also be updated to incorporate new information.

Significance: In the first month, 164 learners have completed at least one module. Success will be determined by the reach of the course

based on the number of practitioners completing a module, number of modules completed, and practitioner discipline. A follow-up survey will be sent to participants to assess ease of use, application to their practice, and overall educational quality.

Neurology

Sat-44. Pharmacist Involvement in Medication Management in a Multidisciplinary Brain Injury Center

Susan Hamblin, Pharm.D., BCCCP, FCCM[1], Candice Smith, MSN, RN, CCRN-K[2], Landry Slaughter, Pharm.D. Candidate[3], Jennifer Beavers, Pharm.D., BCPS[4], Leanne Atchison, Pharm.D.[4] and Bradley Dennis, MD, FACS[2]

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Service or Program: The multidisciplinary Brain Injury Center (BIC) clinic at our level 1 trauma center was established to provide a three-month follow-up for patients after traumatic brain injury (TBI). Patients received evaluation by a nurse, trauma nurse practitioner, and speech language pathologist. Given the complex medication needs following TBI, a clinical pharmacist visit was added to BIC services in 2019. The pharmacist interviewed patients in weekly BIC clinic with the team and documented activities using an intervention documentation system with a pharmacotherapy consultation note in the electronic medical record. The pharmacist collected and documented the current medications, TBI symptoms, counseling points, and medication recommendations in the pharmacotherapy consultation note. This information was also communicated verbally to the team.

Justification/Documentation: Patients who received clinical pharmacy services in BIC clinic between January 2020 and August 2022 were reviewed. The number and types of interventions, as well as medications involved were obtained by chart review. 399 patients received pharmacy services during a total of 461 clinic visits. The average number of interventions per patient and per visit was 2.7 interventions (± 1.4). A formal medication reconciliation was documented in 97% of patients.

Adaptability: All clinic patients had a history of TBI, and the average initial Abbreviated Injury Scale Head was 3 (± 0.9). Pharmacy services were provided by a critical care clinical pharmacist, pharmacy fellows, and supervised student pharmacists.

Significance: Medication discontinuation was recommended for 39 drugs, and 47 new prescriptions were started. Thirty-one dosage adjustments were made. OTC medications were recommended in 175 instances, and 501 medications required counseling. The most common drug classes involved in pharmacist services included non-opioid analgesics (155 visits). Other common drug classes included antiseizure medications, natural sleep aids, and antidepressants. The pharmacist provided consistent medication reconciliation, medication education, OTC medication assistance, and prescription recommendations in this unique practice setting.

Peri-Operative Care

Tues-106. Reducing Surgical Site Infections: Pharmacy-driven Pre-operative Antibiotic Protocol

Ron Welch, Pharm.D.[1], Monica Mcgill, Pharm.D.[2], Samantha Treinish, Pharm.D.[2] and John Burgess, Pharm.D.[1]

(1)Baptist Memorial Hospital- GTR, Columbus, MS (2)Baptist Memorial Hospital-GTR, Columbus, MS

Service or Program: In 2022, our hospital had an increase of surgical site infections that was determined to be partly related to improper preoperative antibiotic choices. Our pharmacy had already implemented a preoperative antibiotic dosing protocol with guidance on dosing for patients, but physicians were choosing inappropriate agents outside this dosing guidance. Reviewing our antibiogram, prescribing patterns, and preoperative antibiotic dosing guidelines, our pharmacy developed a process for reviewing the preoperative antibiotics well-before surgery to ensure time for discussion if agents need to be changed. Weight-based dosing adjustments can also be done at this time. Our pharmacy also highlighted recommendations for cefazolin use, even in penicillin allergic patients, when appropriate. This has led to heightened awareness in our facility regarding its tolerability in penicillin allergic patients and avoidance of unnecessarily broad alternative agents.

Justification/Documentation: Since implementation, our pharmacy team has made > 20 interventions in preoperative antibiotics. The majority of these interventions being an alternative agent recommendation to ensure appropriate coverage and reduce risk of surgical site infections or inappropriate broad-spectrum choices. Our pharmacists present this intervention information quarterly to our P&T committee. No surgical site infections have been identified since protocols implementation.

Adaptability: Using pharmacy review and updated preoperative antibiotic dosing protocol with recommendations from recent literature and our institutional antibiogram, our institution's process can be replicated easily with solid evidence to ensure appropriate preoperative antibiotic choices are made to ensure a reduction in surgical site infections.

Significance: Using this process and protocol, we have been advancing pharmacy's position with surgery and surgeons at our facility and educating our staff on appropriate preoperative antibiotic stewardship. We hope this will lead to collaborative agreement or protocol to change antibiotic choices without the need to contact physicians.

Sun-111. Pharmacist Management of Perioperative Anticoagulation in the Outpatient Setting

Taylor Hibner, Pharm.D., Tiffany Vatterrodt, Pharm.D. and Lindsey Greiner, Pharm.D

Department of Ambulatory Care Pharmacy, Community Health Network, Indianapolis, IN

Service or Program: A multidisciplinary team redesigned Community Health Network's anticoagulation clinic processes to integrate clinical pharmacists to improve patient safety, efficiency, and quality of care. As part of this new workflow, pharmacists are responsible for management of perioperative anticoagulation. A provider will enter an order to hold oral anticoagulation and either assess or defer assessment to pharmacist for subcutaneous anticoagulation bridging. The pharmacist will then review the orders for appropriateness and contact provider if there are any issues or further recommendations per clinical guidelines. Finally, the pharmacist is responsible for developing and communicating instructions to the patient.

Justification/Documentation: Integrating pharmacists provided an innovative solution for the network's identified need for improvement in patient safety and satisfaction regarding perioperative anticoagulation management. After pharmacists began providing this service, both patient safety outcomes and communication among providers improved significantly. Over 6 months, pharmacists identified that 28 of 133 (21%) procedure bridge orders were potentially inappropriate with a 75% provider acceptance rate of recommendations for no anticoagulation bridging. Furthermore, pharmacists are able to intervene in situations where anticoagulation bridging was deemed unsafe, such as history of heparin-induced thrombocytopenia, dialysis, and previous gastrointestinal bleeding.

Adaptability: In outpatient settings where pharmacists are integrated into anticoagulation management, this service could be a valuable addition to improve safety and satisfaction for patients undergoing procedures. Ambulatory care pharmacists are uniquely qualified to assess and manage perioperative anticoagulation therapy as well as provide education.

Significance: Pharmacists' responsibilities were expanded to include high-level decision making regarding the necessity of holding warfarin and bridging based on patient- and procedure-specific bleeding and thrombotic risks. The pharmacists ensure that a perioperative plan is appropriate, the plan is communicated effectively to the patient, and potential barriers to bridging are addressed. Additionally, interdisciplinary teamwork is promoted through contact with nursing staff and providers in coordinating the perioperative plan as needed.

Pharmacogenomics/Pharmacogenetics

Mon-115. Building and Sustaining a Multispecialty Clinical Pharmacogenomics Service Line in a Community Health System

Josiah Allen, Pharm.D.[1], Nihal El Rouby, Pharm.D., PhD[2], Grace Miller, BS[3], Andrea Schumann, Pharm.D.[1] and Jaime Grund, MS, CGC[3]

(1)Department of Pharmacy, St. Elizabeth Healthcare, Edgewood, KY (2) College of Pharmacy, University of Cincinnati, Cincinnati, OH (3) Department of Precision Medicine and Genomic Health, St. Elizabeth Healthcare, Edgewood, KY

Service or Program: St. Elizabeth Healthcare, based in Northern Kentucky, established a clinical pharmacogenomics (PGx) program in 2019 to enable PGx testing for patients and providers systemwide. The program was launched by a part-time PGx pharmacist, who initially focused implementation efforts in oncology.

Justification/Documentation: Our decentralized model uses extensive chart review for consults. Providers place the PGx test order (a 27-gene panel) and PGx pharmacists review results, making recommendations for the initial indication and any ensuant findings. For example, a patient receiving testing to guide chemotherapy decisions may also receive recommendations for antidepressant or antiplatelet therapy. Advantages of this model include holistic patient care and greater provider exposure to PGx applications. Clinical PGx service utilization has expanded markedly in the past 5 years from 3 patients tested in 2018, 767 in 2022, and over 2300 cumulatively as of May 2023.

Adaptability: Initially launched in oncology, our comprehensive approach to PGx implementation allowed for expansion into other clinical areas, particularly primary care. Another full-time PGx pharmacist joined the program in 2022 and focused efforts around five key initiatives: patient/provider education, electronic clinical decision support (eCDS), in-house assay development, policies/procedures, and translational research designed to accelerate implementation efforts. Key elements of success include our comprehensive implementation approach, robust eCDS, and strategic use of quality improvement initiatives with key external partners (e.g., test manufacturers, third-party payors).

Significance: In our institution, clinical pharmacists are recognized as the "owners" of PGx testing and information, and we are in the process of moving to a model that empowers clinical pharmacists across the system to take ownership of PGx results relevant to their specialty. PGx testing has become standard of care prior to any prescribing of capecitabine or fluorouracil, and we are in the process of establishing standards for pre-emptive testing for behavioral health and cardiology medications.

Pulmonary

Sun-123. Inspiring Health Advances in Lung Care (INHALE): New state-wide continuous quality improvement infrastructure partners with clinical pharmacists to improve Asthma and COPD care in Michigan

Nada Farhat, Pharm.D.[1], Hae Mi Choe, Pharm.D.[1], Alicia Majcher, MHSA[1], Michael Sjoding, MD[2], Karla Stoerman Grossman, RN, BSN[2], Toby Lewis, MD[2], Anna Kovalski, MD[2], Arjun Mohan, MD[2], Rommel Sagana, MD[2] and Njira Lugogo, MD[2]

(1)Michigan Institute for Care Management & Transformation, Ann Arbor, MI (2)Michigan Medicine, Ann Arbor, MI

Service or Program: INHALE is a statewide payer-funded (BCBSM) collaborative quality initiative (CQI) aimed at improving patient outcomes and promoting evidence-based care for patients with asthma and COPD across the state of Michigan. Given newer therapeutic approaches, there is significant need for infrastructure to assist local providers in quality improvement efforts. The goal of this collaboration was to establish a role for a clinical lead pharmacist within a BCBSM funded care management organization, Michigan Institute for Care Management and Transformation (MICMT), to improve patient outcomes through CQIs across the state of Michigan.

Justification/Documentation: Administrative claims data demonstrated only 1.5% of patients with pediatric asthma, adult asthma, or COPD had a billed claim to BCBSM for inhaler education (based on CPT code 94664). This provided a unique opportunity for pharmacist involvement to improve inhaler education. Thus, the clinical pharmacist was recruited to provide individual consult services to POs, in addition to serving on the education workgroup creating standardized patient and provider education materials (including patient education handouts, inhaler demonstration videos, guideline updates, and formulary tools to assist with access and cost barriers).

Adaptability: Institutions with clinical pharmacists are encouraged to partner with local, statewide, and national organizations or payers to improve health outcomes for patients. Future years will expand data resources through INHALE to include those with coverage through public insurance programs and other commercial insurers. Furthermore, there is opportunity for incorporation for pharmacy and medical students/residents into the CQI model.

Significance: By fostering interdisciplinary collaboration, this partnership serves as a cornerstone for delivering high-quality, patient-centered care that improves healthcare outcomes on a broader level, through the use of CQIs. Future projects will focus on additional opportunities for pharmacist involvement and analyze improvement in patient outcomes and the inhaler education measure, specifically.

Substance Abuse/Toxicology

Mon-125. Impact of Pharmacist-Driven Initiative to Optimize Buprenorphine Initiation via Micro-Induction in a Community Hospital

Christine A. Hamby, Pharm.D, BCPS[1], Taylor Rider, Pharm.D., BCPS[1], Richard Dent, MD[2] and Fatma Akmese, MD[2]
(1)Department of Pharmacy, Rochester General Hospital, Rochester, NY (2)Rochester Regional Health, Rochester, NY

Service or Program: Buprenorphine is used to treat opioid use disorder, however it is challenging to initiate in patients with concomitant pain as it requires an opioid-free period to avoid precipitated withdrawal. Micro-induction (MI) is an alternative approach where buprenorphine is slowly introduced over several days while opioid therapy is continued until reaching the target dose of buprenorphine. Published reports typically use a consult service to manage this transition, however our hospital does not have an inpatient chemical dependency (CD) service. In 2022, two pharmacist specialists began a program to identify adult inpatients that may benefit from MI.

Justification/Documentation: Pharmacists discussed each case with an outpatient CD provider within the health system, who contacted each patient to consider MI as an alternative to traditional initiation of buprenorphine. Pharmacists entered individualized orders for each patient, discussed the process with the care team, and followed patients daily during MI. MI was done using 150 mcg films for the initial doses followed by 2 and 8 mg tablets until the target dose was reached. A total of 8 patients were started on the MI protocol and none experienced precipitated withdrawal during the titration period. Opioids were successfully discontinued after the maintenance dose was reached.

Adaptability: This process allows for adaptation to hospitals that do not have a CD consult service on-site. Although our program used physician collaboration to contact the patient and explain the protocol, this step could also be carried out by a clinical pharmacist. This process is easily modifiable to staffing needs of individual institutions.

Significance: This pharmacist-driven service provides a novel approach to treat a complex medication issue, especially as hospitalists are frequently unfamiliar with buprenorphine management. Pharmacists are a valuable resource when using MI to initiate buprenorphine without stopping opioids for treatment of pain.

Women's Health

Sun-131. Impact of Pharmacy Resident-Run Obstetric Clinical Service

Min Zhang, Pharm.D., BPCS, BCIDP and Niamh O'grady, Pharm.D
Department of Pharmacy Services, Boston Medical Center, Boston, MA

Service or Program: A pharmacy resident joined the inpatient obstetric (OB) teams and provided comprehensive pharmaceutical care to pregnant and postpartum patients during a clinical rotation. The pharmacist attended daily labor and delivery and postpartum discharge rounds. Interventions by the pharmacist included therapeutic drug selection, dosing, duration, and monitoring. The pharmacist also performed admission medication reconciliations for high-risk patients and facilitated discharge medication reconciliations and counseling. The aim was to enhance patient care through increased interventions and interdisciplinary collaboration.

Justification/Documentation: Extensive literature exists regarding the roles and activities of clinical pharmacists in various practice settings. However, the role of clinical pharmacists in acute OB care is limited. This innovative program aimed to bridge this gap by integrating a clinical pharmacist into an acute OB setting. The primary outcome measure was the average number of pharmacotherapy interventions per month, monitored through electronic medical records. Additionally,

OB providers were surveyed to gather insights into the perceived value of various clinical pharmacy services offered.

Adaptability: The program was implemented with the collaboration of the OB leadership group. The structured framework allowed seamless integration into existing workflows, ensuring efficient and effective patient care. The program's adaptability makes it feasible for implementation in other institutions seeking to enhance OB pharmaceutical care, especially in underserved populations.

Significance: This innovative service significantly improved patient care and addressed the gap in health disparities. The average number of interventions on pharmacotherapy per month increased by 52% (from 100 to 209). Moreover, the survey revealed high provider satisfaction with the clinical services provided. It highlighted the valuable contributions of a dedicated OB clinical pharmacist in optimizing medication therapy and promoting patient safety in the acute setting, filling a gap in the existing literature. A standard model for clinical pharmacist services in the OB field is warranted.

Tues-126. A MULTIDISCIPLINARY QUALITY IMPROVEMENT PROJECT TO INCREASE CHLAMYDIA AND GONORRHEA SCREENING IN A FAMILY MEDICINE CLINIC.

***Jacob Johnson, Pharm.D.*, Jim Hoehns, Pharm.D., Sriya Kalala, N/A, Taylor Hoehns, N/A, Daniel Oswald, DO and Asar Das, MD**

MercyOne Waterloo, Waterloo, IA

Service or Program: Chlamydia and gonorrhea (C&G) infections are often asymptomatic and can lead to pelvic inflammatory disease in women. The CDC recommends annual C&G screening for all sexually active women under the age of 25. Blackhawk County (Iowa) has one of the highest chlamydia rates in Iowa at 840 per 100,000 people in 2021. A baseline audit (2018-2021) of screening for C&G in our family medicine clinic among sexually active females ages 14-25 showed a screening rate of 33.7% (127/377).

A multidisciplinary quality improvement (QI) project was enacted on October 1, 2022, with the goal of increasing clinic screening for asymptomatic C&G to 65%. Key project features included: a new opt-out screening policy, physician educational sessions, monthly chart review by the pharmacist with email communication to physicians detailing current screening adherence. A monthly EHR report was created to identify all clinic females age 14-25 years presenting for an annual wellness visit. Patients were counted as screened if they were tested for C&G at the annual wellness visit or if screened within the past year. Screening rates for C&G were prospectively evaluated for six months following project implementation. A brief follow-up survey about project effectiveness was given to clinic physicians (N=12).

Justification/Documentation: During the 6-month evaluation period the screening rate of C&G improved from 33.7% to 78.1% (N=25/32; P<0.001). The most common reason for patients not being screened was patient refusal (N= 3/7). Ninety-two percent of physicians found the monthly communication about screening adherence helpful and 100% of physicians agreed that the new policy improved screening.

Adaptability: This QI project which included creation of a screening policy, improved education, and monthly clinician feedback about screening performance has broad adaptability to primary care clinics.

Significance: This 6-month QI project was associated with a significant improvement in clinic screening rates for asymptomatic C&G.

ENCORE PRESENTATIONS

CRITICAL CARE

Sun-40. Opioid and Sedative Use in Adult ICUs: AduLt iatrogEnic withdRawal sTudy in the ICU (ALERT-ICU)

Scott Bolesta, Pharm.D., BCPS, FCCP, FCCM[1], Kathryn Smith, Pharm. D.[2], Celine Gelinas, RN, PhD[3], Marc Perreault, Pharm.D., MSc[4], Lisa Burry, Pharm.D., PhD[5], Rebekah Eadie, MPharm, MSc[6], Federico Carini, MD[7], Jamie Harpel, Pharm.D.[8], Ryan Stewart, Doctor of Pharmacy Candidate[8], Richard Riker, MD[2] and Brian Erstad, Pharm.D.[9]

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Sun-39. International Analgesia and Sedation Weaning and Withdrawal Practices in Critically Ill Adults: The AduLt iatrogEnic withdRawal sTudy in the ICU (ALERT-ICU)

Scott Bolesta, Pharm.D., BCPS, FCCP, FCCM[1], Lisa Burry, Pharm.D., PhD[2], Marc Perreault, Pharm.D., MSc[3], Celine Gelinas, RN, PhD[4], Kathryn Smith, Pharm.D.[5], Federico Carini, MD[6], Rebekah Eadie, MPharm, MSc[7], Katrianna Pranga-Saltarelli, Pharm.D.[8], Jennifer Mitchell, Pharm.D.[9], Jamie Harpel, Pharm.D.[10], Ryan Stewart, Doctor of Pharmacy Candidate[10], Richard Riker, MD[5], Gilles Fraser, Pharm. D.[11] and Brian Erstad, Pharm.D.[12]

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Education/Training

Tues-34. Ethical Dilemma Case Discussion within Interprofessional Practice

Ashley Higbea, Pharm.D., BCPS[1], Rebecca Sleeper, Pharm.D., FCCP, FASCP, BCPS[2], Charles F. Seifert, Pharm.D. FCCP. BCPS[2] and Krista Brown, B.S.[3]
(1)Department of Pharmacy Practice, Texas Tech University Health Sciences Center School of Pharmacy, Dallas, TX (2)School of Pharmacy, Texas Tech University Health Sciences Center, Lubbock, TX (3)SOP Administration Lubbock, Texas Tech University Health Science Center Jerry H. Hodge School of Pharmacy, Lubbock, TX Presented at the Texas IPE Consortium, Houston, TX, April 20, 2023.

Emergency Medicine

Sun-63. Review of Mycoplasma genitalium screening and treatment in the Emergency Department

Bryan Gendron, Pharm.D., BCPS, Anne Marie Guthrie, Pharm.D., BCPS, Sopheaktra Kong, Pharm.D. and Natalija Farrell, Pharm.D., BCPS, DABAT, FAACT
Department of Pharmacy, Boston Medical Center, Boston, MA Presented at Massachusetts Society of Health Systems Pharmacist Annual Meeting; Natick, MA, May 18-19, 2023.

Gastroenterology

Sat-29. Lower In-Hospital Mortality and Rebleeding Among Patients with Major Gastrointestinal Bleeding Treated With Andexanet Alfa vs 4-Factor Prothrombin Complex Concentrate

Gregory J. Fermann, MD[1], Craig I. Coleman, Pharm.D.[2], Mark Danese, PhD, MHS[3], Eva Lesén, PhD[4], Mary J. Christoph, PhD, MPH[5], Raymond Chang, MBA, MS[5], Julie Ulloa, PhD[3], Sherry Danese, MBA[3], Bruce Koch, Pharm.D.[5] and *Paul Dobesh, Pharm.D., FAHA, FCCP, BCPS, BCCP*[6]
(1)Department of Emergency Medicine, University of Cincinnati, Cincinnati, OH (2)University of Connecticut School of Pharmacy, Storrs, CT (3)Outcomes Insights, Agoura Hills, CA (4)AstraZeneca, Gothenburg, Sweden (5)AstraZeneca, Wilmington, DE (6)University of Nebraska Medical Center College of Pharmacy, Omaha, NE Poster presented at the American College of Emergency Physicians (ACEP)23 Scientific Assembly, October 9-12, 2023; Philadelphia, PA.

HIV/AIDS

Mon-82. Virological suppression in people living with HIV-1 (PLWH) receiving dolutegravir/lamivudine was high and similar across age groups despite older PLWH having increased rates of comorbidities and polypharmacy (TANDEM subgroup analysis)

Andrew Brogan, PhD[1], Jihad Slim, MD[2], Gustavo Verdier, BSc[3], Gavin Harper, BA[4], Katie Mycock, MChem[4], Hannah Wallis, MS[4], Cynthia Donovan, Pharm.D.[1], Gabrielle Herman, Pharm.D., BCIDP, AAHIVP[1] and *Kristen Fuhrmann, Pharm.D.*[1]
(1)ViiV Healthcare, Durham, NC (2)New York Medical College, Valhalla, NY (3)Montreal, QC, Canada (4)Bollington, United Kingdom Published in Value Health. 2023;26(6 suppl):S406. Abstract SA49.

Mon-52. Effectiveness of dolutegravir + lamivudine in real-world studies in people with HIV-1 with M184V/I mutations: a systematic review and meta-analysis

Madhusudan Kabra, BPharm, MSc[1], Tristan Barber, MD[2], Clotilde Allavena, MD[3], Anne-Geneviève Marcelin, MD[4], Simona Di Giambenedetto, MD[5], Juan Pasquau, MD[6], Nicola Gianotti, MD[7], Matthew Turner, PhD[8], Cale Harrison, MS[8], Tammy Wynne, BSc[8], Gustavo Verdier, BSc[9], Chris Parry, PhD[1], Bryn Jones, MBChB, MRCP[1], Chinyere Okoli, Pharm.D., MSc, DIP[1], Julie Priest, MSHP[10], Emilio Letang, MD, MPH, PhD[11] and *Cale Williams, Pharm.D.*[10]
(1)Brentford, United Kingdom (2)London, United Kingdom (3)Nantes, France (4)Paris, France (5)Rome, Italy (6)Granada, Spain (7)Milan, Italy (8)Cardiff, United Kingdom (9)Montreal, QC, Canada (10) ViiV Healthcare, Durham, NC (11)Madrid, Spain Kabra M, Barber TJ, Allavena C, et al. Effectiveness of dolutegravir + lamivudine in real-world studies in people with HIV-1 with M184V/I mutations: a systematic review and meta-analysis [abstract P081]. J Int AIDS Soc. 2022;25(S6): e26009.

Tues-55. Clinical outcomes with clopidogrel post-percutaneous coronary intervention in people living with HIV/AIDS on boosted antiretroviral therapy

Stanley Luc, Pharm.D.[1], Lee Phan, D.O.[2], Joseph McKeown, D.O.[3] and Francis Zamora, Pharm.D.[4]
(1)Memorial Healthcare System, Pembroke Pines, FL (2)Palmetto General Hospital, Hialeah, FL (3)Broward Health Medical Center, Fort Lauderdale, FL (4)Baptist Health South Florida, Miami, FL Presented at the Florida Society of Health-System Pharmacists Annual Meeting, Orlando, FL, August 6, 2022.

Tues-57. 5-year outcomes of bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) as initial treatment of HIV-1 in adults with high baseline HIV-1 RNA and/or low CD4 count in two Phase 3 randomized clinical trials

Moti Ramgopal, MD[1], Anson Warupa, MD[2], Axel Baumgarten, MD[3], Mezgebe Berhe, MD[4], Anton Pozniak, MD[5], Chloe Orkin, MBBCH[6], Juan Manuel Tiraboschi, PhD[7], Debbie Hagins, MD[8], Hailin Huang, PhD[9], Kristin Andreatta, MSc[9], *Nathan Unger, Pharm.D.*[9], Jason Hindman, Pharm.D., MBA[9], Hal Martin, MD, MPH[9], Jared Baeten, MD[9] and Olayemi Osiyemi, MD[10]

(1)Midway Research Center and Specialty Care, Fort Pierce, FL (2) Infectious Disease Specialists of Atlanta, Decatur, GA (3)Center for Infectious Diseases (zibp), Berlin, Germany (4)North Texas Infectious Diseases Consultants, Dallas, TX (5)Chelsea and Westminster Hospital, London, United Kingdom (6)Queen Mary University of London, London, United Kingdom (7)Bellvitge University Hospital, Barcelona, Spain (8) Coastal CARE Centers, Savannah, GA (9)Gilead Sciences, Foster City, CA (10)Triple O Research Institute, West Palm Beach, FL Presented at IDWeek, Washington, DC, October 19-23, 2022.

Infectious Diseases

Tues-72. A Systematic Literature Review of the Humanistic Burden of *Clostridioides difficile* Infection

Edward P. Armstrong, Pharm.D.[1], *Sissi V. Pham, Pharm.D.*[2], Daniel C. Malone, PhD[1], Duška M. Franić, Pharm.D., MS, PhD[2] and Alpesh Amin, MD, MBA, MACP, MHM, FACC, FRCP[3]

(1)Strategic Therapeutics, Tucson, AZ (2)AESARA, Chapel Hill, NC (3)University of California, Irvine, Irvine, CA Presented at the Society of Gastroenterology Nurses and Associates, Phoenix, AZ, May 7-9, 2023.

Nephrology

Sat-39. Acute Kidney Injury and Augmented Renal Clearance Risk Factor Assessment in Patients with COVID-19

Nicholas Nelson, Pharm.D.[1], Nicholas Farina, Pharm.D.[2] and Denise Rhoney, Pharm.D.[3]

(1)Department of Translational Sciences and Inpatient Practice, Wingate University School of Pharmacy, Wingate, NC (2)University of Michigan Health, Ann Arbor, MI (3)Division of Practice Advancement and Clinical Education, UNC Eshelman School of Pharmacy, Chapel Hill, NC Published in Crit Care Med 2023;51(1):537. doi 10.1097/01.ccm.0000910064.84390.8c.

Nutrition

Tues-90. Evaluation of parenteral nutrition order safety upon transitions of care

Diana Mulherin, Pharm.D., BCNSP, BCCCP, FCCM, Vanessa Kumpf, Pharm.D., BCNSP, FASPEN, Jill Murphree, MS, RD, CNSC, *Sarah Cogle, Pharm.D., BCCCP, BCNSP*, Ankita Sisselman, MD and Dawn Adams, MD, MS, CNSC

Vanderbilt University Medical Center, Nashville, TN Published in Nutrition and metabolism research oral paper session abstracts. JPEN J Parenter Enteral Nutr 2023;47:S5-S48.

Oncology

Mon-107. Dosing, safety, and pharmacokinetics (PK) of combination therapy with darolutamide (DARO), androgen-deprivation therapy (ADT), and docetaxel (DOC) in patients with metastatic hormone-sensitive prostate cancer (mHSPC) in the ARASENS study

Jane McCullough, Pharm.D.[1], Matthew R. Smith, MD, PhD[2], Bertrand Tombal, MD, PhD[3], Maha Hussain, MD[4], Fred Saad, MD, FRCSC[5], Karim Fizazi, MD, PhD[6], Cora N. Sternberg, MD[7], E. David Crawford, MD[8], Natasha Littleton, MSc[9], Yuan Wang, Pharm.D.[10], Weijiang Zhang, PhD[10], Rui Li, MSc[10] and Arash Rezazadeh Kalebasty, MD[11]

(1)Northwestern Memorial Hospital, Chicago, IL (2)Massachusetts General Hospital Cancer Center, Boston, MA (3)Division of Urology, IREC, Cliniques Universitaires Saint Luc, UCLouvain, Brussels, Belgium (4) Northwestern University, Feinberg School of Medicine, Chicago, IL (5) University of Montreal Hospital Center, Montreal, QC, Canada (6)Institut Gustave Roussy, University of Paris-Saclay, Villejuif, France (7)Englander Institute for Precision Medicine, Weill Cornell Department of Medicine, Meyer Cancer Center, New York-Presbyterian Hospital, New York, NY (8) UC San Diego School of Medicine, San Diego, CA (9)Bayer Ltd, Dublin, Ireland (10)Bayer HealthCare Pharmaceuticals Inc., Whippany, NJ (11) University of California, Irvine, CA Presented at the ASCO Genitourinary Cancers Symposium, San Francisco, USA, February 16-18, 2023.

Other

Sun-98. Opinion of Patients and Healthcare Professionals on the Value of Integrating Emojis Into Healthcare Communication

Lisen Arnheim-Dahlström, PhD[1], *Margaret Noyes Essex, Pharm.D.*[2], Karin Hygge Blakeman, PhD[3] and Caroline Weibull, PhD[1]

(1)War on Cancer, Stockholm, Sweden (2)Pfizer Medical, New York, NY (3)Pfizer AB, Stockholm, Sweden Presented at the 23rd International Conference on Integrated Care, Antwerp, Flanders, May 22, 2023.

Sun-129. Study of Association Between E-cigarette Use in US Adults and Both Mental Health and Sleep Quality Using Behavioral Risk Factor Surveillance System (BRFSS) for Years 2017-2018

Jade Thomas, Pharm.D./MSCR Candidate[1], Megan Rimmer, Pharm.D./MSCR Candidate[1], Michael Jiroutek, DrPH, MS[2] and Melissa Holland, Pharm.D., MSCR[3]
(1)Campbell University College of Pharmacy & Health Sciences, Buies Creek, NC (2)Department of Clinical Research, Campbell University College of Pharmacy & Health Sciences, Buies Creek, NC (3)Department of Clinical Research, Campbell University College of Pharmacy and Health Sciences, Buies Creek, NCPresented at ASHP Midyear Clinical Meeting, Las Vegas, NV, December 4-8, 2022.

Pharmacoeconomics/Outcomes

Tues-108. Biosimilar Uptake and Cost Savings Analysis Before and After Implementation of a Pharmacist-driven Substitution Program within a National Community Oncology Network: One Year Follow-Up.

Brooke Peters, Pharm.D., BCOP[1], Jenny Li, Pharm.D., BCOP, BCPS[1], Bradley Winegar, Pharm.D.[1], Robert Carr, Pharm.D., BCOP, BCPS[1], Camilo Rodriguez, CPhT-Adv, CSPT, PRS[1], Ashley Kohler-Gerber, CPhT, CSPT[1], Darell Connor, MHA, FWSPA[1], Kyle Brown, NA[2], Ta'Qyra Freeman, CPhT, CSPT[1] and Melody Chang, RPh, BCOP[1]
(1)Pharmacy Operations, American Oncology Network, Fort Myers, FL (2) American Oncology Network, Fort Myers, FL Presented at the American Society of Clinical Oncology Annual Meeting, Chicago, IL, June 2-6 2023.

Sat-50. Retraining of transplant pharmacy staff to reduce Medicare Part B prescription billing errors in post-transplant recipients

Sarah Osman, CPhT-Adv[1], Kirsten Mitchell, CPhT-Adv[1], Carey Vallone, CPhT[1], Michael Wilson, CPhT[1], Chelsea Ray, CPhT[1], Chris Hayes, Pharm.D.[1], Keren Rodriguez, Pharm.D., CSP[1], Genny Staff, Pharm.D.[1], Rachel Chelewski, Pharm.D., CSP[1], Autumn Zuckerman, Pharm.D.[2] and Katie Hosteng, PhD[3]
(1)Vanderbilt Transplant Pharmacy, Vanderbilt University Medical Center, Nashville, TN (2)Vanderbilt University Medical Center, Nashville, TN (3) Vanderbilt Specialty Pharmacy, Vanderbilt University Medical Center, Nashville, TN Presented at the Academy of Managed Care Pharmacy Annual Meeting, San Antonio, TX, March 21-24, 2023.

Sun-113. Healthcare Resource Use Among US Veterans Treated With Andexanet Alfa or 4-factor Prothrombin Complex Concentrate for Factor Xa Inhibitor-related Major Bleeding

S. Scott Sutton, Pharm.D.[1], Joseph Magagnoli, MS[1], Tammy H. Cummings, PhD[1], Mary J. Christoph, PhD, MPH[2], Raymond Chang, MBA, MS[2], Hungta Chen, PhD[2], Phillip Hunt, ScD, MS[2] and James W. Hardin, PhD[3]
(1)Dorn Research Institute, Columbia VA Healthcare System (151), Department of Clinical Pharmacy and Outcomes Sciences, College of Pharmacy, University of South Carolina, Columbia, SC (2)AstraZeneca Pharmaceuticals, Wilmington, DE (3)Dorn Research Institute, Columbia VA Healthcare System (151), Department of Epidemiology and Biostatistics, University of South Carolina, Columbia, SC International Society on Thrombosis and Haemostasis (ISTH) 2023 Congress, June 24-28, 2023; Montreal, Canada.

Pharmacokinetics/Pharmacodynamics/Drug Metabolism/Drug Delivery

Mon-116. Crushing valbenazine capsule contents for potential addition to soft foods or administration via G-tube

Mello Hebert, BS, Alexander Mar, BS, Richard Moore, MBA, Ali Bristow, MS, *Brittany Harbert, Pharm.D.* and Scott Siegert, Pharm.D
Neurocrine Biosciences, Inc., San Diego, CA Presented at IAPRD, Chicago, IL, May 13-16, 2023. Presented at ATMRD, Washington D.C., June 9-11, 2023.

Mon-118. Valbenazine Effects on the Dopamine System in Humans, as Measured by [^{11}C]-PHNO Positron Emission Tomography (PET)

Ryan Terry-Lorenzo, PhD[1], Daniel Albrecht, PhD[1], Satjit Brar, PhD[1], *Brittany Harbert, Pharm.D.*[1], Graham Searle, PhD[2], Frans Van Den Berg, MB.ChB[2], Ilan Rabiner, BSc Hons, MBBCh, FCPSych SA[2] and Dietrich Haubenberger, MD, FAAN[1]
(1)Neurocrine Biosciences, Inc., San Diego, CA (2)Invicro, London, United Kingdom Presented at ACNP, Phoenix, AZ, December 4-7, 2022. Presented at ASENT, Virtual, March 13-15, 2023.

Psychiatry

Mon-117. Valbenazine Improves Tardive Dyskinesia With or Without Concomitant Antipsychotic Therapy: A Meta-Analysis of Three Long-Term Valbenazine Trials

Eduardo Dunayevich, MD[1], Stephen Marder, MD[2], Stewart Factor, DO[3], *Brittany Harbert, Pharm.D.*[1], Yumi Watanabe, PhD[4] and Arline Nakanishi, MS[1]
(1)Neurocrine Biosciences, Inc., San Diego, CA (2)Department of Psychiatry and Behavioral Science, UCLA David Geffen School of Medicine, Los Angeles, CA (3)Department of Neurology, Emory University School of Medicine, Atlanta, GA (4)Mitsubishi Tanabe Pharma Corporation, Osaka, Japan Presented at Psych Congress Elevate, Las Vegas, NV, June 1-4, 2023.

Sat-54. Cross-Mapping the Outpatient Best Practice Model Statements with BCPP and CMM Components

Richard Silvia, Pharm.D., BCPP
Department of Pharmacy Practice, MCPHS School of Pharmacy-Boston, Boston, MA Presented at the American Association of Psychiatric Pharmacists Annual Meeting, April 16-19, 2023 in Atlanta, Georgia.

Substance Abuse/Toxicology

Sun-125. Integrating a Community Methadone Program Within a Federally Qualified Health Center

Nicole Gastala, MD[1], Christine Neeb, MD[2], Maria Bruni, PhD[3], Jessica Richardson, MD[4], Samantha Madrid, BS[4], Linda Lesondak, PhD[4] and *Brianna M. McQuade, Pharm.D., BCACP, MHPE*[5]
(1)University of Illinois at Chicago (UIC), Division of Substance Use Prevention and Recovery (SUPR) of the IL Department of Human Services (IDHS), Chicago, IL (2)Department of Family Medicine, University of Illinois Chicago College of Medicine, Chicago, IL (3)Family Guidance Centers, Inc., Chicago, IL (4)University of Illinois at Chicago Mile Square Health Center (MSHC), Chicago, IL (5)Pharmacy Practice, University of Illinois at Chicago College of Pharmacy, Chicago, IL Presented at the American Society of Addiction Medicine Annual Meeting, Washington DC, April 13-16.

Transplant/Immunology

Sat-58. Cost Analysis Of Once Daily Extended-release Tacrolimus & Twice Daily Immediate-release Tacrolimus For Kidney Transplant Recipients

Rachel Chelewski, Pharm.D., CSP[1], Chris Hayes, Pharm.D.[1], Keren Rodriguez, Pharm.D., CSP[1], Autumn Zuckerman, Pharm.D.[2], Bridget Lynch, Pharm.D.[3], Ryan Moore, PhD[4], Leena Choi, PhD[5] and Jacob Bell, N/A[6]
(1)Vanderbilt Transplant Pharmacy, Vanderbilt University Medical Center, Nashville, TN (2)Vanderbilt University Medical Center, Nashville, TN (3) VUMC Pharmacy Data Analytics, Vanderbilt University Medical Center, Nashville, TN (4)VUMC Department of Biostatistics, Vanderbilt University Medical Center, Nashville, TN (5)Department of Biostatistics Department, Vanderbilt University Medical Center, Nashville, TN (6)VUMC Pharmacy Data Analytics Department, Vanderbilt University Medical Center, Nashville, TN

Presented at the American Transplant Congress, San Diego, CA, June 3-7.20

Mon-32. Conversion of Tacrolimus Immediate Release to LCP Tacrolimus in Non-Kidney Transplant Recipients

Stefani Lucarelli, Pharm.D.[1], Thu Le, Pharm.D.[2], Alicia Lichvar, Pharm. D.[1], Janice Kerr, Pharm.D.[1], Shirley Tsunoda, Pharm.D.[3] and *Ashley Feist, Pharm.D.*[3]
(1)Dept of Pharmacy, UC San Diego Health, La Jolla, CA (2)Department of Transplant Surgery, Stanford Health Care, Stanford, CA (3)Skaggs School of Pharmacy and Pharmaceutical Sciences, UC San Diego, La Jolla, CA Abstract published in AJT 2023;23(6):A510. Presented at The American Transplant Congress, San Diego, CA June 6, 2023.

Sun-128. Impact of time from transplant to treatment of patients with refractory cytomegalovirus infection: post hoc analysis of Phase 3 SOLSTICE study

Roy Chemaly, MD, MPH[1], Robin K. Avery, MD[2], Sanjeet Dadwal, MD[3], Nassim Kamar, MD[4], Johan Maertens, MD[5], Genovefa Papanicolaou, MD[6], Oliver Witzke, Univ.-Prof. Dr. med.[7], Joan Gu, PhD[8] and *Jessica Auciello, Pharm.D., MPH*[8]
(1)Department of Infectious Diseases, Infection Control, and Employee Health, University of Texas MD Anderson Cancer Center, Houston, TX (2) Johns Hopkins University, Baltimore, MD (3)City of Hope National Medical Center, Duarte, CA (4)Toulouse Rangueil University Hospital and University Paul Sabatier, Toulouse, France (5)University Hospitals Leuven, Leuven, Belgium (6)Memorial Sloan Kettering Cancer Center, Weill Cornell Medicine, New York City, NY (7)Department of Infectious Diseases, West German Centre of Infectious Diseases, University Hospital Essen, University Duisburg-Essen, Essen, Germany (8)Takeda Development Center Americas, Inc., Lexington, MA Presented at the Annual Congress of the Swiss Society for Allergology and Immunology (SSAI) and International Immunocompromised Host Society (ICHS) Joint Meeting, Basel, Switzerland, September 8 –11, 2022.

Women's Health

Sun-99. The effectiveness of sharing stories about menopause-related symptoms and lifestyle management approaches: Findings from qualitative research on women's understanding and activation after listening to a menopause podcast

Margaret Noyes Essex, Pharm.D.[1], Amy Sumner, PhD[2], Philippa Shaw, PhD[2], Candida Halton, MSc[2], Stacy Bailey, PhD MPH[3], Mary Jane Minkin, MD[4], Helaine Bader, MPH[5] and Tina Cartwright, PhD[2]
(1)Pfizer, Inc., New York City (2)University of Westminster, London, United Kingdom (3)Division of General Internal Medicine and Geriatrics, Northwestern University, Chicago, Illinois, USA, Chicago, IL (4)Yale University School of Medicine, New Haven, CT (5)HealthyWomen, Middletown, NJ Presented at the 18th World Congress on Menopause by

the International Menopause Society, Lisbon, Portugal, October 26-29, 2022.

LATE BREAKING ORIGINAL RESEARCH

ADR/Drug Interactions

Tues-1. COLCHICINE, DRUG-DRUG INTERACTIONS AND GASTROINTESTINAL ADVERSE EFFECTS

Lama Alfehaid, Pharm.D., MME[1], Omar Alkhezi, Pharm.D.[2], Yahya Tawifk, Pharm.D.[3], Akshay Desai, MD, MPH[4], Amil Shah, MD MPH[5], Peter Libby, MD[3] and Leo Buckley, Pharm.D.[6]

(1)Pharmacy Department, Brigham and Women's Hospital, Boston, MA (2)College of Pharmacy, Qassim University, Qassim, Saudi Arabia (3) Brigham and Women's Hospital, Boston, MA (4)Cardiovascular Innovation Program at Brigham and Women's Hospital, Boston, MA (5) UT Southwestern Medical Center, Dallas, TX (6)Department of Pharmacy Services, Brigham and Women's Hospital, Boston, MA

Introduction: Colchicine reduces the risk of recurrent ischemic events in coronary heart disease. Colchicine drug-drug interactions (DDI) may increase the risk of gastrointestinal (GI) adverse effects, but the only available data include pharmacokinetic studies and case reports.

Research Question or Hypothesis: Is there an association between concomitant CYP3A4 and P-gp-mediated DDIs and the risk of GI adverse events among people taking colchicine?

Study Design: This study was a quantitative, post-hoc analysis of a randomized clinical trial.

Methods: In this study, we re-analyzed data from the COLCORONA trial, which compared colchicine 0.5 mg twice daily for three days, then 0.5 mg daily after that (n=2235), and placebo (n=2253) for 30 days. The primary outcomes were GI adverse events with concomitant CYP3A4 Inhibitors and P-glycoprotein inhibitors. Data were analyzed using Stata 17.0, Wilcoxon rank-sum used for continuous variables, and Chi-square test for categorical variables. The association between the number of CYP3A4 or P-gp inhibitors used at baseline and the risk of overall and treatment-related GI adverse events was assessed separately in the colchicine and placebo arms using age-, sex- and eGFR-adjusted logistic regression models.

Results: The median age was 54 years, and 54 % of participants were women. The most common DDIs were atorvastatin (14%), azithromycin (5%), and simvastatin (2%). The odds of an overall GI adverse event were 1.58 times higher for each additional CYP3A4 or P-gp inhibitor used at baseline in the colchicine arm (OR [95% CI]: 1.58 [1.05-2.38]), but not the placebo arm (OR [95% CI]: 0.91 [0.65-1.26]). Each additional CYP3A4 or P-gp inhibitor used at baseline was associated with a trend towards higher odds of treatment-related GI adverse events in the colchicine arm (OR [95% CI]: 1.48 [0.95-2.24]), but not the placebo arm (OR [95% CI]: 0.82 [0.59-1.14]).

Conclusion: CYP3A4 and P-gp inhibitor DDIs may have a higher risk of colchicine-related GI adverse effects.

Adult Medicine

Sun-7. Predicting INR trends in newly initiated patients based on average percent change in steady-state warfarin dose

Leah Dykstra, Student Pharmacist[1] and Jon P. Wietholter, Pharm.D, BCPS, FCCP[2]

(1)School of Pharmacy, West Virginia University, Morgantown, WV (2) Department of Clinical Pharmacy, West Virginia University School of Pharmacy, Morgantown, WV

Introduction: Warfarin's narrow therapeutic index and interpatient variability present challenges when optimizing therapy. International normalized ratio (INR) values are used to monitor therapy, but are difficult to predict based on warfarin dosing changes. The primary purpose of this study was to evaluate INR trends compared to warfarin dosage changes to evaluate whether degree of warfarin dosage adjustment could help predict future INR changes.

Research Question or Hypothesis: Can percent INR change be predicted based on warfarin dosage changes in new-start warfarin patients once at steady-state?

Study Design: This was a retrospective chart review of patients newly initiated on warfarin in an inpatient setting.

Methods: Included patients were at least 18 years old, admitted to WVU Hospitals, not on warfarin prior to admission, and had baseline and day 7 INRs. Demographic data, daily warfarin doses, and daily INR values were collected through day 11 of hospitalization. Percent change in daily warfarin dose was calculated and compared to INR percent change after patients were at steady-state. For the primary outcome, mean percent change in warfarin dose was compared to mean percent change in INR values 24 and 48 hours later. Descriptive statistics via means and standard deviations were utilized for statistical analysis.

Results: A total of 183 of 433 patients (42%) received at least 6 consecutive days of warfarin therapy after initiation between January 2019-July 2021 and met inclusion criteria. The mean increase in warfarin dose and INR at 24 and 48 hours later was 10.17% ± 56.97%/9.34% ± 19.06%/6.26% ± 19.89% on day 6, 17.39% ± 72.14%/6.26% ± 19.89%/5.13% ± 20.65% on day 7, 25.46% ± 90.80%/5.13% ± 20.65%/7.32% ± 23.55% on day 8, and 15.30% ± 69.28%/7.32% ± 23.55%/4.38% ± 13.93% on day 9, respectively.

Conclusion: Due to large standard deviations, no direct predictive trends could be determined between warfarin dosage change and INR in our study population.

Tues-8. Meds-to-Beds Delivery Reduces Readmissions at an Academic Medical Center

***Carrie Tilton, Pharm.D.*[1], Natalie Delozier, Pharm.D.[1], Marion Javellana, Pharm.D.[1] and Nicole L. Metzger, Pharm.D.[2]**

(1)Emory University Hospital, Atlanta, GA (2)Department of Pharmacy Practice, Mercer University College of Pharmacy, Atlanta, GA

Introduction: Prescribed medications are delivered to hospitalized patients before discharge using meds-to-beds programs. The data is mixed on whether meds-to-beds programs reduce readmissions. This study evaluates the impact of a meds-to-bed program on readmissions.

Research Question or Hypothesis: Does a meds-to-beds program at an academic medical center reduce readmission rates?

Study Design: We conducted a retrospective cohort study of patients admitted from 01/01/2022-07/30/2022 and compared the readmission data for patients who received meds-to-beds with patients who did not (non-meds-to-bed group).

Methods: The primary outcome was the readmission rate to the hospital or emergency department (ED) within 30 days. Secondary outcomes included 7-day readmission rates, 60-day readmission rates, and 7-day fill history for non-meds-to-beds patients. We compared readmission rates by using a logistic regression model.

Results: A total of 768 patients were included with 384 patients in each group. Overall, the patients had a mean age of 59.5 years-old, 54% were male, and 90.8% had insurance. The patients who received meds-to-beds were younger ($p<0.0001$), less likely to be female (39.3% vs. 52.6%, $p=0.0003$), and were more likely to be uninsured (15.4% vs. 2.9%, $p<0.0001$). Patients in the non-meds-to-beds group had higher odds of readmission between 0-30 days than patients who received meds-to-beds (OR 2.425; 95% CI 1.674-3.514, $p<0.0001$). For secondary outcomes, non-meds-to-beds patients had higher odds of readmission from 0-7 days (OR 4.2; 95% CI 2.331-7.569) and from 0-60 days (OR 1.747; 95% CI 1.244-2.455) than patients who received meds-to-beds. Insurance status was not significantly associated with 30-day readmission ($p=.0916$). The 7-day fills in the non-meds-to-bed group was 70.8% (any medication) and 46.4% (high-risk medications).

Conclusion: Patients who received meds-to-beds had significantly lower odds of being readmitted at 7 days, 30 days, and 60 days compared with patients who did not use the meds-to-beds program.

Ambulatory Care

Sun-14. Identifying facilitators, barriers, and perceptions of pharmacist-led collaborative drug therapy modification (CDTM) implementation in Georgia

Sharmon P. Osae, Pharm.D., BCACP[1], Ashlee Harvey, Pharm.D. Candidate[2], Russ Palmer, Ph.D.[3], Devin Lavender, Pharm.D., BCPS, BCACP[2], Blake Johnson, Pharm.D., MPH, BCACP[2], Chelsea Keedy, Pharm.D.[4], Beth B. Phillips, Pharm.D., FCCP, BCPS[2], Henry Young, Ph. D., FAPHA[2] and Rebecca H. Stone, Pharm.D., BCPS, BCACP, FCCP[2]

(1)Department of Clinical and Administrative Pharmacy, University of Georgia College of Pharmacy, Albany, GA (2)Department of Clinical and Administrative Pharmacy, University of Georgia College of Pharmacy, Athens, GA (3)Office of Instructional Innovation and Research, University of Georgia College of Pharmacy, Athens, GA (4)Department of Clinical and Administrative Pharmacy, University of Georgia College of Pharmacy, Savannah, GA

Introduction: Georgia Board of Pharmacy (BOP) regulations permit pharmacists to engage in collaborative drug therapy modification (CDTM) with physicians, allowing them to perform patient assessments, adjust pharmacotherapy, and order laboratory tests. Pharmacist-led CDTM can positively impact health outcomes leading to reduced healthcare expenditures. CDTM is underutilized, with <1% of Georgia pharmacists holding an active CDTM license.

Research Question or Hypothesis: What are pharmacist-reported factors that facilitate or impede successful pharmacist implementation of CDTM within Georgia?

Study Design: Qualitative, semi-structured interviews, thematic analysis

Methods: All Georgia-licensed CDTM pharmacists were invited to participate in a 60-minute qualitative interview. Interview questions were developed from electronic survey responses. The interview was designed to elicit information regarding the primary end points of perceived benefits and barriers to CDTM implementation. Nine interviews were conducted. Thematic analysis was applied to identify themes utilizing AtlasTI software to code. Themes were described qualitatively and prevalence of each was reported. Data saturation was achieved at interview seven and 96% coding agreement was reached among two independent researchers.

Results: Nine themes were identified and each was categorized as a facilitator or barrier to establishing pharmacist-led CDTM in Georgia. Themes associated with facilitating were [prevalence %]: 1) practice autonomy [100], 2) personal attributes [100], 3) having support [100], and 4) institutional logistics [88]. Barrier themes included issues concerning: 5) the Georgia BOP [100], 6) pharmacist autonomy [88], 7) federal and state policy [88], 8) institutional restrictions [75], and 9) personal development (e.g., confidence) [22].

Conclusion: Facilitators to the establishment of pharmacist-led CDTM exist and pharmacists can capitalize on these to create successful CDTM programs. Barriers are varied, and although it may be difficult to systematically address individual barriers such as pharmacist autonomy and personal development, many barriers can likely be removed or addressed by policy, such as issues with institutional restrictions and the Georgia BOP, and state or federal policies.

Mon-2. Rural Health System Administrator Perspectives on Expansion of Clinical Pharmacy Services in Georgia

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Introduction: In Georgia, Pharmacists may enter into Collaborative Drug Therapy Modification (CDTM) agreements under physician supervision, allowing adjustments of dosages, dosing schedules, and/or medications within a defined protocol. Currently, less than 1% of Georgia Pharmacists have an active CDTM license. Engaging in CDTM agreements can result in increased access to healthcare and reduced healthcare expenses, especially in rural areas.

Research Question or Hypothesis: What do rural Georgia health system administrators report as key factors impacting successful implementation of CDTM agreements?

Study Design: Exploratory Qualitative Interview Research

Methods: Complete target population sampling was used within a rural Georgia health system to increase the likelihood of data saturation and provide the best opportunity for generating comprehensive findings. All seven administrators within the health system were interviewed regarding their knowledge of pharmacists training, pharmacist-led CDTM in Georgia, and benefits/barrier to implementation of pharmacist-led CDTM in their health system. Transcription of the interviews was completed. A two-cycle inductive coding process utilizing constant comparison was employed to identify themes verified by analyst triangulation.

Results: Thematic analysis identified six themes. There was an inconsistent understanding of the knowledge, skills, and abilities of pharmacists, under CDTM agreements. Perceived benefits identified were [prevalence %] (1) improved patient care [100], (2) increased value-based metrics [71], and (3) enhanced physician-pharmacist collaborations [57]. Several factors were noted as barriers: (1) physician acceptance [71], (2) pharmacist knowledge and comfort [57], and (3) loss of revenue [86]. Administrators reported education regarding pharmacists abilities under CDTM agreements and evidence of benefit would aid in overcoming perceived barriers.

Conclusion: As crucial collaborators in ensuring successful implementation of pharmacist-led CDTM, health system administrators' limited understanding of pharmacists' abilities under CDTM agreements can be a significant barrier to overcome. Improving understanding, addressing perceived barriers, and emphasizing identified benefits, can help expand pharmacist-led CDTM agreements in Georgia.

Cardiovascular

Tues-21. Effect of guideline-directed medical therapy on rehospitalizations among patients with acute heart failure and a concomitant infection

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Introduction: Infection frequently accompanies acute heart failure (HF) and is associated with an increased risk of mortality and HF hospitalizations. Guideline-directed medical therapy (GDMT) is frequently changed during hospitalizations, and de-escalation of GDMT is associated with increased mortality and hospitalizations after discharge. Whether GDMT affects rehospitalization risk among patients with acute HF and a concomitant infection is unknown.

Research Question or Hypothesis: Escalation of GDMT is associated with decreased rehospitalizations among patients hospitalized with acute HF and concomitant infection.

Study Design: Retrospective cohort study

Methods: Patients hospitalized for acute HF from 2016 to 2020 were identified using data from Inovalon. This administrative claims database includes medical and prescription claims data from public and private payers. Patients were identified based on International Classification of Disease – 10th Edition and diagnosis-related group codes and stratified into two groups based on the presence of a concomitant infection. Propensity-score matching corrected imbalances in baseline covariates. The primary outcome was rehospitalization within 12 months of discharge. A Cox regression model was used to analyze the effect of change in GDMT use from prior-to-admission to discharge on the primary outcome in the cohort with a concomitant infection. The pre-specified alpha was 0.05. Statistical analyses were run in SPSS version 29.0.

Results: 26,648 matched patients were included in the analysis. Concomitant infection was associated with an increased rehospitalization risk. Among patients with a concomitant infection, change in GDMT significantly affected rehospitalization risk. Rehospitalization risk decreased when GDMT use escalated (HR 0.67, 95% CI (0.64-0.71)) at discharge and increased when GDMT was maintained (HR 1.17, 95% CI (1.12-1.23)) or de-escalated (HR 1.98, 95% CI (1.84-2.13)).

Conclusion: Escalation of GDMT was associated with decreased rehospitalization risk among patients hospitalized with acute HF and a concomitant infection.

Tues-18. Drug Utilization and clinical outcomes of dual or single antiplatelet therapy after percutaneous coronary intervention

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Introduction: Dual antiplatelet therapy (DAPT), comprising aspirin and a P2Y12 inhibitor, has been recommended for preventing secondary cardiovascular events following percutaneous coronary intervention (PCI). However, variations in DAPT have also been used in clinical practice

Research Question or Hypothesis: After the initial 90-day post-PCI, SAPT and DAPT have the same effects on prevention of the secondary cardiovascuar events

Study Design: Retrospective cohort study using real-world claim data

Methods: Claims data from the Health Insurance Review and Assessment Service were used in this study. Clinical outcomes, including net adverse clinical events (NACE) such as death, myocardial infarction, ischemic stroke, revascularization, and bleeding were assessed at 12 and 24 months (M) after PCI. The adjusted Hazard ratios (aHR) of NACE in SAPT versus DAPT groups were compared

Results: The results identified 232,760 patients diagnosed with ACS who underwent PCI between 2015 and 2020. The initial 90-day post-PCI DAPT usage was reported with 183,910 (79.01%) in the aspirin + clopidogrel (AC), 37,290 (16.02%) in the aspirin + ticagrelor (AT), and 11,560 (4.97%) in the aspirin + prasugrel (AP) group out of total patients. The continuous use of DAPT was 145,134 (81.41%) in AC, 24,239 (17.60%) in AT, and 8,889 (4.99%) in AP group out of 178,262 patients excluding the switcher to other antiplatelets.The SAPT use after 90 days post-PCI was 6,338 in C, 1,063 in T, and 100 in P groups out of 7,501 patients excluding the switch to other antiplatelets.The aHR of NACE in the overall SAPT compared to DAPT was 1.05 (95% CI, 0.99-1.11, p=0.11) at 12M post-PCI and 0.99 (95% CI, 0.95-1.04, p=0.79) at 24M post-PCI.

Conclusion: The study found no significant difference in overall clinical outcomes between DAPT and SAPT. However, Individual agents of SAPT and DAPT have shown some disparities. This suggests that SAPT may be the possible option for some patients, with various therapeutic considerations

Tues-22. The Impact of a Student Pharmacist-led Inpatient Medication Counseling on Heart Failure Hospital Readmission Rate.

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Introduction: Nearly one in four heart failure (HF) patients are readmitted to the hospital within a period of 30 days, in which about 25% of heart failure readmissions is preventable. HF hospital readmission places financial, emotional, and clinical burdens on patient and healthcare system. In the effort to improve HF readmission rate and patient outcomes, pharmacist involvement has shown to be the optimal care to assist patients with understanding the disease progression and ensure medication compliance.

Research Question or Hypothesis: This study examined the impact of pharmacy student-driven medication reconciliation and counseling in patients with HF on the hospital readmission rate and patient perspectives of care survey, Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS).

Study Design: This single-center, retrospective cohort review was conducted at a 250-bed community hospital. The data was collected through the EMR chart review.

Methods: The adult patients admitted from March 2022 to June 2022 with the HF diagnosis were included. Patients were excluded if they were admitted for less than 24 hours or hospice care. The primary outcome was 30-day hospital readmission rate.

Results: A total of 136 patients were included in the study, 108 (79%) received pharmacy student-driven medication counseling and reconciliation. The average age was 67 years; 80% were white; 17% were African American, and 34% had a commercial insurance. The 30-day readmission rate in patients received pharmacy counseling was 26%, versus 29% in the group did not receive pharmacy counseling. The first quarter of HF 30-day readmission rate among Medicare patients was 25.5% and the rate in the second quarter, which was the study period was reduced to 12%. HCAHPS score on medication communication improved from 40 to 74 in the quarter 1 and 2, respectively.

Conclusion: Pharmacy-led medication counseling in patients with HF had shown to make a significant impact in 30-day readmission rate and patient survey.

Community Pharmacy Practice

Tues-24. Evaluation of community-based pharmacy readiness to implement long-acting injectable antipsychotic (LAI-A) administration services in North Carolina

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Introduction: Long-acting injectable antipsychotic (LAI-A) medications demonstrate benefits to psychiatric patients. In North Carolina (NC), pharmacists were granted authority to administer LAI-As in 2021. Community pharmacists are in a great position to increase LAI-A administration access; however, the extent to which they offer this service is unknown.

Research Question or Hypothesis: What are barriers or facilitators to implementing LAI-A administration?

Study Design: Cross-sectional survey emailed to all actively licensed NC community-based pharmacists.

Methods: The survey was open for 30 days with a reminder sent on day 15. Responses from community-based pharmacists licensed in NC were included if at least one non-demographic survey question was answered. Survey questions were adapted from the R=MC[2]

Readiness Thinking Tool, assessing for barriers or facilitators to implementing LAI-A administration services based on motivation, innovation-specific capacity, and general capacity for change. Results were analyzed using SPSS v.28. Descriptive statistics, Mann Whitney U (ordinal variables), and student's t-test (continuous variables) were used to evaluate data. Statistical significance was defined as $p<.05$.

Results: A 6.7% response rate (319/4800) was yielded; 219 responses met inclusion criteria. Responses were received from independent (n=75, 34%), grocery/merchandiser (n=20, 9.1%), chain (n=77, 35.2%), and other (n=47, 21.5%) community-based settings. Most respondents did not administer LAI-As (n=158, 72.1%), while a minority did (n=61, 27.9%). Significant differences existed in all domains of the R=MC^2 Tool: motivation (5/6 items); innovation-specific capacity (4/6 items); and general capacity for change (4/8 items). The top barriers to implementation were time constraints (n=89), staff training (n=72), and concern of legal liability (n=69). Sites who administered LAI-As reported precepting more students (4.8 vs. 2.0; $p<00.1$) and residents (1.0 vs. 0.4; $p=.02$) compared to sites not administering LAI-As.

Conclusion: Community-based pharmacists who administer LAI-As scored higher on most items related to motivation, innovation-specific capacity, and general capacity for change. Barriers to administration were time constraints, staff training, and concern of legal liability.

Critical Care

Tues-26. Tenecteplase Versus Alteplase: A Comparison Of Bleeding Outcomes (TACO)

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Introduction: Alteplase and tenecteplase are administered in ischemic stroke and massive pulmonary embolism (PE) to attempt reperfusion of vessels but carry serious concerns for increased bleed risk. Ballad Health recently adopted tenecteplase as the formulary thrombolytic.

Research Question or Hypothesis: The purpose of this study is to compare the incidence of bleeding with tenecteplase versus alteplase within Ballad Health facilities.

Study Design: This was a retrospective, observational cohort study.

Methods: This study included adults who received tenecteplase or alteplase from October 1, 2020 through May 31, 2023. All tenecteplase patients who met inclusion criteria were analyzed. To balance the cohorts, alteplase patients were randomized 1:1 to tenecteplase patients. The primary outcome was a bleeding composite including incidence of major bleed per the International Society on Thrombosis and Hemostasis (ISTH), intracranial hemorrhage (ICH), or subarachnoid hemorrhage (SAH). Secondary outcomes included incidence of symptomatic ICH, in-hospital mortality, administration of reversal agents, and length of stay. Mann Whitney-U testing was utilized for analysis of continuous data and Chi-Squared or Fisher's Exact for dichotomous data.

Results: In each cohort, 175 patients were analyzed. No statistically significant difference in the bleeding composite was found, although 13% of alteplase patients versus 15% of tenecteplase patients experienced bleeding. More patients in the tenecteplase cohort experienced symptomatic ICH and required initiation of massive transfusion protocol, however neither outcome was statistically significant. Incidence of in-hospital mortality, thrombolytic reversal, and length of stay were similar between the cohorts. Subgroup analysis of 45 massive PE patients revealed higher rates of the bleeding composite in the tenecteplase cohort, 14% alteplase versus 21% tenecteplase (p-value 0.5665).

Conclusion: This study did not demonstrate a statistically significant difference in bleeding. However, these results suggest there may be reason for concern in patients treated with tenecteplase in the setting of massive PE. Larger studies are required to confirm these findings.

Sat-23. Evaluation of critical care pharmacist evening services at an academic medical center

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Introduction: Critical care pharmacists are considered essential members of the healthcare team; however, justification and recruitment of new positions, especially in the evening or weekend shifts, remains a significant challenge. The purpose of this study was to investigate the number of interventions, type of interventions and associated cost savings with the addition of one board certified critical care clinical pharmacist to evening shift.

Research Question or Hypothesis: What are the characteristics and associated cost avoidance of the interventions performed by an evening shift critical care pharmacist?

Study Design: Prospective cohort study.

Methods: This was a prospective collection and characterization of one evening shift critical care pharmacist's clinical interventions over a 12-week period. Interventions were collected and categorized daily from 13:00 to 22:00 Monday through Friday. After collection was complete, cost savings estimates were calculated using pharmacy

wholesaler acquisition cost. Descriptive statistics were performed on all variables.

Results: Interventions were collected on 52 of 60 weekdays. A total of 510 interventions were collected with an average of 9.8 interventions accepted per day. The most common interventions included transitions of care, medication dose adjustment, and antibiotic de-escalation and the highest proportion of interventions occurred in the medical intensive care unit. An estimated associated cost avoidance of $66,537.80 was calculated for an average of $1,279.57 saved per day. Additionally, 22 (4.1%) of interventions were considered high yield interventions upon independent review by two pharmacists.

Conclusion: The addition of one board-certified critical care pharmacist to evening shift resulted in multiple interventions across several categories and a significant cost avoidance when calculated using conservative measures.

Drug Information

Sun-47. Improving Health Equity: Assessing Accessibility of Patient Medication Information

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Introduction: Currently, there are limited options for patients with visual impairment or blindness to obtain accessible written medication information which is a health inequity.

Research Question or Hypothesis: The objectives of this study were to determine the availability of accessible medication guides provided by the manufacturer and identify common barriers reported by patients with visual impairment in obtaining accessible written medication information in healthcare settings.

Study Design: Prospective, cross-sectional, descriptive and survey-based study

Methods: A total of 39 manufacturers were contacted about the availability of accessible medication guides or an alternative format for patients with visual impairment. Fifty medication guides were then assessed using a checklist based on revised Section 508 guidelines and tested with a screen reader for accessibility. To identify barriers in obtaining written medication information, respondents were recruited by Qualtrics to fill out an anonymous, online 13-question survey from September to October 2022. Descriptive statistics were used to report the data.

Results: All manufacturers did not provide an accessible medication guide or an alternative format. Common errors found by the screen reader were lack of a description for images (alternative text) and headings were not available to help with navigation. As for the survey, a total of 699 participants responded. The median age was 35 years and 49% of respondents were female. A paper copy was the most common format (38%) provided in the pharmacy and barriers identified included lack of Braille or electronic options and personnel not equipped to serve patients with visual impairment.

Conclusion: With the lack of accessible written medication information as a barrier to health equity, pharmacists and manufacturers need to provide alternative formats such as audio, electronic formats, or braille to patients with visual impairment.

Education/Training

Tues-37. Evaluating Social Determinants of Health Content in Therapeutics Courses within a Pharm.D. Curriculum

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Introduction: Developing health equity-minded student pharmacists requires longitudinal curricular integration of social determinants of health (SDOH). Currently, there is a lack of student perceptions around this integrated information as well as identified individual curricular gaps. Purdue College of Pharmacy evaluated students' perceived incorporation of SDOH in didactic therapeutic courses.

Research Question or Hypothesis: From the student's perspective, how are SDOH incorporated into Integrated Pharmacotherapy courses during the didactic portion of a pharmacy curriculum?

Study Design: Observational study

Methods: This study evaluated the included SDOH concepts in the Integrated Pharmacotherapy sequence during the 2021-2022 school year. Two trained students from each class (P1, P2, P3) completed a standard survey to collect SDOH content included within lectures. The SDOH concepts evaluated: race, gender, sexual orientation, access to care, language/health literacy, neighborhood/built environment, socioeconomic status, and other vulnerable populations. Outcomes analyzed using descriptive statistics included SDOH concept frequency and type included in lectures and the overall Integrated Pharmacotherapy sequence.

Results: Overall, 261 lectures from five courses were analyzed. Students surveyed agreed that 74 (28.4%) lectures included at least one SDOH. When reviewed by year, 43%(P1), 31%(P2) and 18%(P3) of lectures included at least one SDOH. Of the SDOH concepts analyzed, "Vulnerable Populations" (10%), "Race" (5.7%) and "Access to Care" (4.6%) were covered most frequently. During the lectures, SDOH content was most frequently identified in: epidemiology (23.3%), pathophysiology (18.6%), therapeutics (34.1%) and patient cases (17.8%). When further evaluated, epidemiology portions only included concepts of gender and race (33%). Additionally, when

SDOH were included in patient cases, students perceived their inclusion significantly impacted case discussions.

Conclusion: This study evaluated an entire Integrated Pharmacotherapy sequence for the inclusion of SDOH content. Unfortunately, a minority of therapeutics lectures included any SDOH. However, this study highlights opportunities for meaningful SDOH content inclusion in therapeutics to foster the development of a health equity mindset in future pharmacists.

Sun-57. Through the lens of societal norms and experiences: students' conceptualization of patient case data when diversity is apparent

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Introduction: Equity, diversity, inclusion, and accessibility is a strategic priority for healthcare education. Preliminary data shows that diversity is largely not present in case-based learning materials, but when included, systemic racism and discrimination may be present. Hypotheses according to social cognition theory suggest that learning material may promote harm due to a 'hidden curriculum' that directs students to focus on specific characteristics of patients rather than focusing on the patient case. These hypotheses need to be tested to better understand how learning material can be redesigned to minimize cultural biases and stereotypes.

Research Question or Hypothesis: How do pharmacy students conceptualize a patient when reviewing a clinical case with varying representation of diversity?

Study Design: A qualitative, virtual interview-based study was conducted to determine how pharmacy students synthesize and construct visual representations of patients depicted in case-based learning materials.

Methods: Students were exposed to 6 different patient cases with varying characteristics of diversity present and were asked to think-aloud of how they visualized that patient. Audio-recordings were transcribed verbatim and framework analysis was used to code and categorize data. Themes were interpreted and confirmed by the investigator team from categorized data.

Results: Eighteen interviews were conducted, and six themes were identified to explain how students conceptualize case patients: case data, self-reflection, personal experiences, professional experiences, population stereotypes, and societal norms. Students drew from one or more of these themes depending on availability of case data present and their own experiences.

Conclusion: The findings of this study align with social cognition theory and support the notion that limiting diversity descriptors within cases may promote a hidden curriculum by requiring students to rely on their own personal experiences or default to population stereotypes and societal norms when conceptualizing patient case data.

Tues-38. Impact of Fourth-Year Advanced Pharmacy Practice Experiences (APPEs) on Cultural and Social Determinants of Health (SDOH) Knowledge and Skills Development

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Introduction: Pharmacy accreditation requirements include cultural competency and SDOH skills. The impact of APPEs on these areas has been minimally explored and not within the same cohort.

Research Question or Hypothesis: Do cultural and SDOH knowledge and skills increase after APPEs?

Study Design: Pre/post validated surveys

Methods: Pharmacy students completed the Self-Assessment of Perceived Level of Cultural Competence (SAPLCC) survey with anonymous codes at the end of their third-year capstone course (required) and APPEs (optional). SAPLCC consists of 75 items (4-point Likert scale) within six domains and one global score (total 300 points). Five demographic survey items were included. Average domain scores were classified as low (<2), moderate (2-3) and high (>3). Sum scores are domain items added together. Matched surveys were analyzed with descriptive statistics and paired T-test for sum scores with SPSS v29; $p \leq 0.05$ significant.

Results: Seventy-three students completed both surveys (75% response). Matched cohort was 25.4 ± 3.7 years old, 74% female, 86% White, 40% Arab-American, 46% Christian, and 25% Muslim.

Domains	Knowledge	Skills	Attitudes	Encounters	Abilities	Awareness	Global
No. items	16	11	15	11	13	9	75
Max sum points	64	44	60	44	52	36	300
Post P3 sum	50.3	36.9	55.0	34.3	45.0	31.5	252.9
Post P4 sum	50.3	37.0	54.0	35.0	45.6	31.2	253.2
P4 % max points	78.5%	84.2%	90.1%	79.6%	87.8%	86.6%	84.4%
P4 % self-classifying as high scores	51%	70%	82%	54%	78%	70%	77%

All domain and global sum scores after APPEs were not statistically different from pre fourth-year scores.

Conclusion: Cultural and SDOH knowledge and skills did not increase after APPEs. Self-assessed knowledge and encounter domains were the lowest after APPEs. Potentially enhancing APPE training in these areas could increase student abilities.

Tues-40. Clicks for credit: an analysis of how healthcare professionals use social media to consume continuing professional development content

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Introduction: Previous studies have examined social media habits and utilization patterns among various groups of healthcare professionals (HCPs). However, very few studies have evaluated the use of social media to support Continuing Professional Development (CPD) activities. The goal of the 2023 Clinical Education Alliance (CEA) social media survey was to explore how HCPs interact professionally with social media, describe utilization trends, and identify barriers to using social media to disseminate CPD content.
Research Question or Hypothesis: How do HCPs utilize social media for their professional development?
Study Design: Digital voluntary survey
Methods: We conducted an online anonymous, voluntary survey of HCPs contained in the CEA learner database from January to March 2023. The survey was distributed via email and all learners were invited to participate regardless of profession or specialty. This survey consisted of 16 questions and collected demographic information and social media utilization and habits of HCPs. Relationships between variables were reported using descriptive analyses using SPSS 29.0 for Windows. Missing responses and unanswered questions were not included in the final analyses.
Results: Of the 2,615 HCPs who completed the survey, 71.2% use social media. Most respondents were practicing in an urban setting (59.6%) and have been practicing for more than 15 years (70.5%). The most widely used platform was Facebook (70.7%), but there were no significant differences among the different professions. Of the respondents who use social media, 44.5% used social media to access CPD-certified activities. Surveyed learners preferred passive participation with social media content. Participant-reported concerns include issues with legitimacy of the information, privacy, time constraints, and institutional barriers.
Conclusion: As the CPD community continues to evolve and seek new innovative strategies to reach HCPs, the findings of this survey highlight the need to identify and enact social media-based strategies aimed to engage HCPs and provide them with unbiased evidence-based education.

Mon-64. Variability Upon Entry and Learning Similarities of Cultural and Social Determinants of Health (SDOH) Concepts Within Cohorts Across a Doctor of Pharmacy Curriculum

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Introduction: Understanding variability in cultural and SDOH knowledge and skills of students entering pharmacy school, and how these change over the program is important for developing effective educational strategies to prepare students to provide person-centered care.
Research Question or Hypothesis: Does variability exist in cultural and SDOH competency among students entering a culture-intensive first-year course? Is learning consistent as students' progress through the pharmacy curriculum?
Study Design: pre/post validated survey
Methods: Students anonymously completed the Self-Assessment of Perceived Level of Cultural Competence (SAPLCC) survey before and after a culture and SDOH-rich P1 course (required), after P3 capstone course (required) and after P4 APPEs (optional); four cohorts P1(pre/post 2021-2023), P3 (2021-2023) and P4 (2022-2023). SAPLCC consists of 75 items (4-point Likert scale) within six domains, and one global score (300 points). Descriptive statistics, Kruskal-Wallis and Mann-Whitney were used (SPSS v29; $p \leq 0.05$ significant).
Results: P1 students were 23.7 ± 3.9 years old, 68% female, 79% White, 40% Arab Americans 50% Christian, and 35% Muslim: not statistically different across cohorts.
Conclusion: Initially, students had significantly different knowledge and skills scores, but similar SAPLCC global scores. Learning was not

Cohorts (no. students)	Statistical Differences (p-values) Within Cohort						
Domains	Knowledge	Skills	Attitudes	Encounters	Abilities	Awareness	Global
No. Items	16	11	15	11	13	9	75
P1 Pre (n=257)	0.008	0.043					
P1 Post (n=249)	0.004					0.026	0.010
P3 (n=239)			<0.001			0.030	
P4 (n=164)	0.003	0.033		0.037			0.033

(blank = not significant). Global scores were P1 pre 196.0 ± 28.6, P1 post 246.3 ± 32.1, P3 252.8 ± 30.3, and P4 247.7 ± 32.5: 66.0%, 83.0%, 84.3%, 83.4% of total score respectively.

consistent across the cohorts. After first and fourth year, students' global scores were statistically different. After P1, P3, and P4 years, 2-3 domains were statistically different between classmates. Additional knowledge, skills, and awareness training, including cultural encounters, are required for students to achieve similar cultural and SDOH competencies.

Emergency Medicine

Mon-84. Case-control evaluation of the ratio of calcium replaced to blood administered during massive transfusion in trauma patients

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Introduction: Patients with severe trauma often experience extensive acute blood loss and require activation of massive transfusion protocols (MTP) for resuscitation. For a number of reasons, including citrate toxicity, hypocalcemia is a common occurrence in MTP. Hypocalcemia during MTP is associated with increased mortality, however optimal calcium replacement has not been elucidated.

Research Question or Hypothesis: To investigate the ratio of calcium supplementation to blood products administered during MTP to propose a strategy for mitigating hypocalcemia.

Study Design: single-center retrospective case-control

Methods: All patients aged 15 and older with a trauma alert and MTP activation within 4 hours of admission were included. This IRB-approved study was conducted at an urban, level I trauma center between January 1, 2016 and December 31, 2021. Patients who expired in the trauma bay and those who sustained catastrophic head injuries were both excluded. The primary endpoint was the ratio of elemental calcium administered to blood products transfused, stratified by lowest ionized calcium (iCa) level, including severe hypocalcemia (iCa <3.0 mg/dL), hypocalcemia (iCa 3-4 mg/dL), and normocalcemia (iCa >4.0 mg/dL). Additional endpoints included assessment of all-cause inpatient mortality, coagulopathies, and metabolic derangements. Statistical analysis was completed using Shapiro-Wilk, one-way ANOVA, and Chi-squared tests with significance at $p<0.05$ (SASv9.4).

Results: A total of 259 patients met study criteria, with 84 severely hypocalcemic, 70 hypocalcemic, and 105 normocalcemic. Across all strata, a ratio of 30 mg elemental calcium was replaced per unit of blood product administered, with no statistically significant differences between groups ($p=0.460$). Secondary outcomes revealed statistically significant metabolic and coagulopathic derangements, worsening with increasing degree of hypocalcemia.

Conclusion: Consistent with prior literature, hypocalcemia was associated with worse outcomes in a trauma population undergoing massive transfusion. Based on these data, we are proposing an empiric replacement of no less than 30 mg elemental calcium per unit of blood transfused for future exploration in our institutional MTP.

Family Medicine

Tues-48. Assessment of Educational-Based Intervention to an Interprofessional Academic Based Service of Chronic Opioid Pain Prescribing

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Introduction: The updated CDC opioid pain guidelines are a resource for safe and effective prescribing. However, there is no standardized approach to prescribing opioids among primary care providers (PCPs). There are limited studies showing the effectiveness of education-based interventions on increasing knowledge and comfort of opioid regimen prescribing in an interprofessional setting.

Research Question or Hypothesis: Providers who receive an opioid management educational intervention will have improved knowledge and comfortability of opioid prescribing.

Study Design: Prospective cross-sectional survey.

Methods: All PCPs at UB|MD Family Medicine were sent a pre-survey as part of this University at Buffalo IRB approved study. The pre-survey assessed knowledge gaps of chronic opioid management including deprescribing, dose reduction, concurrent benzodiazepine use, naloxone, and constipation treatment. Utilizing results, a 45-minute educational intervention was executed by a multi-disciplinary team. The post-survey included pre-survey and additional feedback questions. Descriptive statistics were used to describe baseline demographics with paired t-tests to analyze pre-post distribution significance.

Results: A total of 18 PCPs (69.2% RR) replied to the pre-survey. However only 10 completed both the educational intervention and post-survey and included in the analysis. The average experience and time collaborating with pharmacists was 10 ± 6 and 7 ± 6 years respectively. There was an increase in the knowledge of opioid prescribing (43% vs 77%, Difference = 34%; 95% CI 21-50%, $p <0.001$) and clinical comfort with prescribing (33% vs 73%, Difference = 40%; 95% CI 21-59%, $p <0.004$). All participants reported receiving more education on opioid management is useful and most reported additional electronic health record support is needed to better manage opioid regimens (90%). All participants reported educational intervention material was helpful and would recommend to others.

Conclusion: The educational intervention provided in an interprofessional setting showed improved opioid knowledge and clinical comfort in prescribing among providers. Further skill development with opioid therapy prescribing is warranted.

Geriatrics

Tues-53. Reduction of Potentially Inappropriate Medication Use in Geriatric Clinics in a Medical Center in Southern Taiwan from 2018-2022: A Repeated Cross-Sectional Study

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Introduction: Elderly patients are more likely to experience the adverse effects of potentially inappropriate medication (PIM), including anticholinergics.

Research Question or Hypothesis: To investigate the prevalence of PIM use among geriatric clinic outpatients after implementing the clinical decision support system (CDSS).

Study Design: Cross-sectional study

Methods: We conducted a repeated cross-sectional study of elderly outpatients aged 65 and above who visited geriatric clinics in a medical center between 2018 and 2022. The CDSS for PIM was implemented in 2018. We reviewed electronic medical records retrospectively to identify the use of PIMs based on the 2019 Beers Criteria and Anticholinergic Cognitive Burden scale. We excluded as-needed prescriptions and calculated the annual prevalence of prescribing at least one PIM to evaluate the change in PIM use. We also examined the characteristic of the study population annually, including sex and comorbidity. We performed logistic regression to estimate the prevalence Odds Ratio (OR) and 95% confidence interval (CI), comparing the annual prevalence of at least one PIM use from 2018 to 2022, with 2018 as the baseline year.

Results: We observed a decreasing trend in using at least one PIM from 2018 to 2022. Specifically, the annual prevalence of at least one PIM use decreased from 67.11% in 2018 to 63.94% in 2022 (adjusted OR= 0.83; 95%CI: 0.75, 0.93). Furthermore, there was a significant reduction in the annual prevalence of anticholinergics use in 2022 compared to 2018 (adjusted OR= 0.79; 95%CI: 0.72, 0.88). In subgroup analysis, we found a significant decrease in ergoloid mesylates use, the most frequently prescribed PIMs in 2018, compared to 2022 (OR = 0.80; 95% CI: 0.70, 0.90). However, the use of proton-pump inhibitors raised noticeably throughout the study period.

Conclusion: Our study showed that incorporating CDSS can improve medication prescribing practices and reduce PIM use for older geriatric clinic outpatients, demonstrating the potential benefit of utilizing CDSS.

Tues-51. Medicare Part D Plan Comparisons and Switching

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Introduction: Medication affordability influences adherence, which affects health outcomes. Medicare beneficiaries can compare Part D plans to switch to better coverage, lower cost plans, however many don't or can't.

Research Question or Hypothesis: Can student pharmacists save older adults money by doing Part D plan comparisons?

Study Design: prospective clinical pharmacy service assessment

Methods: Adults 65 and older on or needing a Medicare Part D plan attended a plan comparison with a student pharmacist from Wayne State University (WSU) at independent community pharmacies or a senior center and from University of Southern California (USC) at campus or online retired faculty and staff events. Comparisons had pharmacist oversight. Comparisons were done 10/28-11/18/2022 with Medicare or Amplicare Part D software. Participants completed a 23-item investigator-developed satisfaction survey. Descriptive statistics and nonparametric tests were conducted with SPSS v29; $p \leq 0.05$ significant.

Results: Forty-eight participants (28 USC, 20 WSU) had plan comparisons. They were 76.2±6.7 years old and 60% female. Thirty-one participants (65%) completed the satisfaction survey. Participants had found previous plan comparisons complicated and frequently had others assist. Plan comparisons took 34.8±11.7 minutes. Seventeen participants were already on the lowest cost plan. Twenty-two participants switched to lower cost plans. Seven participants did not switch because minimal cost savings (N=3) or other reasons (N=4). Two participants started new plans. Cost savings from plan switches were total $53,932 and average $2,451; not statistically different by site. Savings ranged from $65 to $18,793, with median savings $437 after excluding one outlier. Most participants (97%) were satisfied with the program, and all would recommend the program to others.

Conclusion: After plan comparisons, about half of the participants had cost savings from switching to lower cost Part D plans. Conducting Medicare Part D plan comparisons with older adults is a valuable service that can be done by student pharmacists outside of the healthcare system.

Health Services Research

Sun-72. The Burden of an Identity: Coping Strategies for Sexual and Gender Minority Individuals in Pharmacy Practice

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Introduction: Sexual or gender minority (SGM) individuals are known to experience stigma and discrimination in pharmacy settings. It is also known that SGM individuals may delay or avoid care in pharmacies due to the stress associated with these experiences. Aside from avoidance, however, little is known about how SGM individuals cope with stigma and discrimination and how their coping strategies may influence their healthcare behaviours.

Research Question or Hypothesis: This study aimed to characterize how SGM individuals cope with stigma and discrimination in pharmacy settings.

Study Design: This was a qualitative phenomenological study using semi-structured interviews.

Methods: SGM individuals living in a Canadian Maritime province were eligible for this study. Interviews followed a theoretically underpinned topic guide designed to elicit participants' experiences in pharmacies. Interviews were recorded and transcribed verbatim. Thematic analysis was conducted to identify themes. Two investigators independently inductively coded each transcript and discrepancies in coding were resolved using discussion. Codes were then combined into categories and themes were interpreted from the categorized data.

Results: A total of 31 SGM individuals completed the interviews (80% visiting pharmacies at least monthly). Five themes were identified to explain how SGM individuals cope with stigma and discrimination in pharmacy settings: avoidance (avoiding or withdrawing from care), seeking support (from people or familiar settings), perseverance (when faced with no other option), concealment (of SGM identity when possible), and lowering expectations (of pharmacist knowledge and competence).

Conclusion: Findings support the notion that individuals cope in different ways and across a wide spectrum of behaviours. Those that avoid care, conceal their SGM identity, or are forced to persevere through interactions may be at increased risk for both physical and mental health disparities. Those that seek support or lower expectations may also be at risk of reduced access to quality care.

Infectious Diseases

Tues-65. An Evaluation of the Synergistic Activity of Tetracycline Combinations Against Clinical *Acinetobacter baumannii* Strains Including CRAB

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Introduction: *Acinetobacter baumannii* poses a threat to public health due to limited treatments and high mortality. Eravacycline (ERV), tigecycline (TGC), and minocycline (MIN) are potential treatment options due to their stability against multiple resistance mechanisms. Combination therapy is standard treatment for moderate to severe carbapenem-resistant *A. baumannii* (CRAB) infections. However, there has been limited data regarding the role of tetracyclines (TETs) in combination with other agents against *A. baumannii*.

Research Question or Hypothesis: We sought to evaluate the *in vitro* activity of tetracycline-derivatives alone and in combination against *A. baumannii* strains.

Study Design: Susceptibility testing and time-kill assay (TKA)

Methods: Ninety-three *A. baumannii* strains were obtained from HonorHealth Network, Abrazo Community Health Network (Phoenix, AZ), and the FDA-CDC Antimicrobial Resistance Isolate Bank (Atlanta, GA). ERV, MIN, TGC, meropenem (MEM), sulbactam (SUL), and colistin (COL) were purchased. MIC was performed using broth microdilution according to CLSI. TKA was performed against 4 strains in duplicate. Antimicrobials were tested at 1xMIC alone and in combination. Synergy was defined as ≥ 2-$\log_{10}$ decrease at 24h in combination compared to alone, and antagonism was defined as ≥ 2-$\log_{10}$ increase.

Results: $MIC_{50/90}$ (μg/mL) for ERV, TGC, MIN, MEM, SUL, and COL were 1/2, 2/8, 8/16, 64/256, 16/64, and 1/2, respectively. The strains for TKA were H-3945 (pan-susceptible), AR-309 (TGC-S, CFDC-R CRAB), and AR-306/307 (pan-resistant). Bactericidal activity was not observed with monotherapy at 24h. TGC+MER and TGC +SUL demonstrated synergistic activity at 24H with all strains, including AR-307 (-4.88±0.02 $\log_{10}$ CFU/mL). Synergy was observed with ERV+MER against all CRAB strains. ERV+COL was the most active combination against AR-309 compared to other combinations (-6.49 ±0.05 log10 CFU/mL).

Conclusion: Our study demonstrated both ERV- and TGC-based combinations as the most active, particularly with MER against pan-R CRAB infections. *In vitro* pharmacokinetic/pharmacodynamic and *in vivo* studies are warranted to confirm these findings.

Tues-69. The Children are Off the Bench and on the Scoreboard: Implementation of a Prioritization Scoring Tool to Manage Antimicrobial Stewardship (ASP) Documentation and Intervention in the Pediatric Population

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Introduction: Antimicrobial stewardship (ASP) programs lead to improved patient outcomes. Pharmacy interventions can be prioritized by leveraging electronic medical record (EMR) automation with clinical decision support tools. Despite a large amount of data on ASP programs in adults, there is currently a lack of data on the optimization of ASP efforts in the pediatric population.

Research Question or Hypothesis: What is the process/impact of a pharmacist-led ASP prioritization scoring tool in the pediatric population?

Study Design: Retrospective, observational, descriptive analysis.

Methods: The Medical University of South Carolina (MUSC) Shawn Jenkins Children's Hospital (SJCH) is a tertiary care pediatric hospital that is part of MUSC Health, a multicenter, integrated health system. MUSC Health created a multidisciplinary subgroup to develop/implement an ASP scoring, documentation, and intervention tool in the pediatric population. The primary objective of this study was to describe the use/implementation of this prioritization scoring tool for ASP efforts in the pediatric population with a subsequent descriptive evaluation of our program.

Results: The prioritization scoring tool was developed to score patients based on key infection- and antimicrobial-related measures, classifying potential ASP interventions as higher priority based on a higher score. Additionally, an EMR-based smart flow sheet process was generated for documentation of interventions and a monthly report was created to track ASP efforts and improve upon the ASP process. Implementation of the ASP scoring, documentation, and intervention tool began at MUSC Health for pediatric inpatients in January 2022. A six-month analysis revealed documentation for 765 pediatric inpatient encounters. The most frequently documented encounters were for positive blood cultures (39.1%) and pediatric ASP on-call (22.9%). There were 230 recommended ASP interventions with an acceptance rate of 71.3%.

Conclusion: Creation of a scoring/documentation tool can prioritize pediatric patient review, potentially resulting in more timely/effective ASP interventions. This tool could grow ASP in limited resource environments.

Tues-64. Analysis of the Recurrence Rate of *Clostridioides difficile* Using Vancomycin Prophylaxis Once vs Twice Daily: A Retrospective Cohort Study

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Introduction: *Clostridioides difficile* infection (CDI) commonly causes healthcare-associated diarrhea that leads to increased costs and mortality. Recurrence is common and increases mortality. Recent CDI management guidelines suggest oral vancomycin prophylaxis (OVP) in high-risk patients without dosing recommendations. OVP 125mg once or twice daily are commonly ordered regimens. Minimal literature suggests that a twice-daily regimen may adversely affect recurrence rate, and OVP is costly for many patients. Clarifying the effects of OVP dosing strategy on patient-centered outcomes can further optimize CDI management and potentially reduce healthcare costs.

Research Question or Hypothesis: To compare rate of CDI recurrence with vancomycin vs twice daily

Study Design: Retrospective cohort study

Methods: Adult patients admitted from January 1, 2021 to August 3, 2023 who received OVP 125mg once or twice daily and systemic antibiotics were included. The primary outcome was rate of CDI recurrence, defined as a positive *C. difficile* toxin or treatment initiation within 90 days of OVP completion. Secondary outcomes were length of stay and 30-day mortality. Outcomes were modeled using logistic or linear regression.

Results: A total of 180 patients met inclusion criteria, while 46 patients were excluded primarily due to vancomycin taper. Of 133 remaining patients, 19 and 114 received once- and twice-daily OVP, respectively. Baseline characteristics were similar in both arms, but the once-daily group was more severely ill. Recurrence rate in the twice-daily group was not significantly different compared to the once-daily group (OR = 0.64 [0.06 – 6.95]). Our study also did not demonstrate a significant difference in 30-day mortality (OR = 2.83 [0.27 – 30.17]) or length of stay (OR = 3.67 [0.02 – 673.05]).

Conclusion: The recurrence rate was similar using OVP once vs twice daily. Mortality and length of stay were also similar. Future investigation is warranted with a larger sample size.

its significance in enhancing AMS implementation and addressing AMR during these challenging periods.

Tues-70. Real-World Experience with Ceftaroline Fosamil in the Pediatric Population: A Focus on Patient Outcomes

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Introduction: The misuse of antimicrobials within children is fueled by a lack of pediatric-specific data. Ceftaroline fosamil (CPT) is a novel cephalosporin FDA-approved in children for acute bacterial skin and skin structure infections and community-acquired bacterial pneumonia. Despite the accumulating evidence in adults, there is a substantial void of real-world data to guide CPT use in the pediatric population.

Research Question or Hypothesis: What are the real-world clinical outcomes in the pediatric population following treatment with CPT?

Study Design: Retrospective, observational cohort.

Methods: Any pediatric inpatients treated with CPT between July 2014 to June 2023 were included. Baseline demographics, as well as clinical/microbiologic data, were extracted from electronic medical records. The primary outcome was clinical success in patients that received ≥48 hours of therapy: defined as a composite of survival at 30 days, lack of 30-day microbiologic recurrence, and resolution in signs/symptoms of acute infection, without therapy modification based on clinical failure. Secondary outcomes included adverse effects and provider motives for utilization. Descriptive statistics were utilized for analysis.

Results: Overall, 20 patients were included: median (IQR) age and weight were 3.5 (2.0-10.7) years and 16.2 (11.8-35.1) kg, respectively; 50.0% were Caucasian, 65.0% were male, and the majority (65.0%) received intensive unit care. The pediatric infectious diseases service was involved in all cases. The most frequently isolated pathogens included *Staphylococcus aureus* (50.0%), coagulase negative staphylococci (12.5%), and *Streptococcus pneumoniae* (12.5%). The most common dosage regimen and infectious site was CPT 12 mg/kg IV q8h (50.0%) and was of respiratory origin (45.0%), respectively. Clinical success occurred in 92.3% of cases, while no patients experienced an adverse effect while on therapy. Common motives for CPT use included regimen consolidation or synergistic effects.

Conclusion: CPT represents a promising option for use in children given the degree of clinical success and no observed adverse effects. Larger, multicenter studies are needed to validate our preliminary findings.

Medication Safety

Tues-78. Evaluation of an Inpatient Automatic Dose Reduction Protocol for Concentrated Insulin Glargine upon Therapeutic Interchange to Insulin Detemir on Hypoglycemia Rates

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Introduction: A previous study at Ascension Seton Hospital Network (ASHN) found a 1:1 dose conversion to insulin detemir 100 units/mL (iDet100) from insulin glargine 300 units/mL (iGlar300) increased the risk of hypoglycemia as compared to 1:1 conversion from insulin glargine 100 units/mL. No studies have evaluated an automatic 20% dose reduction on therapeutic interchange from iGlar300 to iDet100.

Research Question or Hypothesis: Is there less hypoglycemia following implementation of a 20% dose reduction protocol from iGlar300 to inpatient iDet100?

Study Design: Multi-center, retrospective, chart-review comparing hypoglycemia before and after a 20% dose reduction was implemented within ASHN.

Methods: This study was a before/after study evaluating impact of ASHN protocol implemented in April 2021 requiring a minimum 20% reduction from home iGlar300 to inpatient iDet100. Previously, a 1:1 interchange was standard. Patients admitted between May 2019 and December 2022 were included if one dose of iDet100 was received following interchange from iGlar300. The primary endpoint was hypoglycemia incidence before and after protocol implementation. Secondary endpoints include time to first hypoglycemia and number of doses given before hypoglycemia. Logistic regression analyzed the relationship between percent interchange from home dose and hypoglycemia rate. Statistical analyses conducted with JMP Pro16.

Results: 284 patients were included: 128 in the pre-protocol and 156 in the post-protocol arm. The incidence of hypoglycemia was significantly less in the post-protocol arm than pre-protocol (11.7% vs. 24.7%; p=0.014). Median time to first hypoglycemia was significantly shorter in the pre-protocol arm (19 vs. 13 hours, p=0.041). For each percent reduction from iGlar300 to iDet100, the likelihood of hypoglycemia was reduced by 33% (OR=0.33; 95% CI [0.11-0.97]).

Conclusion: A protocol requiring a minimum 20% dose reduction from iGlar300 to inpatient iDet100 reduced hypoglycemia. Hospitals should consider adopting a similar policy to reduce hypoglycemia upon interchange.

Nephrology

Tues-85. Reducing Medication-related Disparities and Addressing Needs in Black Persons with Chronic Kidney Disease: Key Insights from Patients

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Introduction: Black persons comprise 13% of the U.S. population but represent 32% of people with kidney failure. Medication-related disparities may contribute to these disparities. New classes of medications show promise in reducing chronic kidney disease (CKD) progression. Including patients' perspectives are essential to ensure optimal medication and equitable health outcomes.

Research Question or Hypothesis: (1) What are patients' concerns or challenges with medications? (2) What do they want to know about their medications? (3) What motivates them to learn about their medical conditions and medications? (4) How can patients and healthcare professionals build trusting relationships?

Study Design: We used a qualitative design with focus group methodology.

Methods: Facilitator guides were developed based on literature review with input from community stakeholders. Participants that self-identified as African American or Black were recruited nationally and represented all stages of chronic kidney disease. Patient focus groups were facilitated by the principal investigator or graduate research assistant and patient research team members. Interviews were transcribed verbatim, and inductive thematic analysis procedures were followed. NVivo© qualitative data analysis software facilitated analysis. Principles of rigor for qualitative research outlined by Lincoln and Guba were maintained.

Results: Four overarching themes and associated sub-themes emerged: (1) meet patients where they are, (2) the patient journey with medications, (3) significant interactions with healthcare professionals, and (4) recommendations for healthcare professionals. Strategies were compiled for pharmacists and healthcare professionals to effectively engage and empower Black persons with CKD to participate in shared decision-making and their care.

Conclusion: Awareness of biases and historical experiences, attention to patient needs and priorities, and using strategies to overcome barriers and empower patients are anticipated to reduce medication-related disparities and improve this population's health outcomes.

Neurology

Mon-106. Lifespan and Locomotion Effectiveness of Novel Anti-Amyloidogenic Agents on Transgenic *Drosophila melanogaster* Model of Alzheimer's Disease

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Introduction: The accumulation of amyloid-β (Aβ) peptide and hyperphosphorylation of tau protein are thought to contribute to the pathogenesis of Alzheimer's Disease (AD). Studies in recent years have shown that certain small molecules can inhibit the formation of Aβ42 peptides into oligomers and plaques. Some recently synthesized curcumin analogues displayed sub-micromolar activity *in vitro*, towards Aβ aggregation; however, these were not tested in any animal model.

Research Question or Hypothesis: Novel anti-amyloidogenic agents will lead to improved lifespan and/or locomotion, when tested on Aβ transgenic *Drosophila melanogaster*.

Study Design: *nSyb-Gal4* was crossed with UAS-Aβ42 to generate a transgenic line of interest. Compounds A, B, and C, in concentrations of 1, 10, and 100 µg each, per 8 mL of fly food, were used to test the compounds' effectiveness in adult flies (n=10).

Methods: Compound effectiveness was assessed by performing the lifespan (log-rank test) and forced climbing assay (two-way ANOVA). The assessment of Aβ42 peptide accumulation in the brains of the flies treated and untreated with compounds was quantified via ELISA.

Results: The lifespan of anti-amyloidogenic agent-fed treatment groups did not differ significantly compared to the control group. However, treatment groups performed better on the forced climbing assay, by up to 68% when fed Compound B (1 µg) indicating improved locomotor activity. Preliminary ELISA data (n=1) indicates no alteration in Aβ42 generation regardless of compound or concentration differences.

Conclusion: Compound A and C did not show a statistically significant difference in lifespan and locomotor activity compared to control. However, Compound B showed a statistically significant improvement in locomotion while still maintaining the same level of Aβ42 accumulation in the brain, indicating its use as a potential agent in AD. Future studies will be repeated to confirm results.

Oncology

Tues-93. Immune checkpoint inhibitors related adverse events in cancer patients with good versus poor performance status: A real-world nationwide retrospective analysis

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Introduction: Immune checkpoint inhibitors (ICIs) have revolutionized cancer treatment, but concerns linger over the generalizability of their safety due to the underrepresentation of patients with poor performance status (PS) in randomized controlled trials (RCTs). This study aims to assess the safety of ICIs in this population by comparing the incidence of immune-related adverse events (irAEs) between patients with good PS (ECOG 0–1) and poor PS (ECOG 2+)

Research Question or Hypothesis: Does the use of ICIs result in a higher incidence of irAEs in patients with poor PS?

Study Design: A retrospective analysis of real-world patient data.

Methods: Patients` data who received ICIs in Qatar between 2015 and 2020 were examined. Out of 254 identified patients, medical records were scrutinized to determine irAE incidence and characteristics in those with poor versus good PS.

Results: Out of the 254 patients, 184 (72%) had good PS, while 70 (28%) exhibited poor PS. Median ages were 55 and 61 for good and poor PS groups, respectively (table1). In the good PS group,

94 patients (51.1%) developed irAEs, compared to 37 patients (52.9%) in the poor PS group (p-value 0.89). The incidence of irAEs were comparable and statistically insignificant between both groups (table2). However, cardiac irAEs were significantly more frequent in patients with poor PS [3 (1.6%) vs. 7 (10%), p-value 0.015]. Thoracic and gastrointestinal cancer diagnoses were common among patients who developed irAEs in both groups. A total of 16 fatal irAEs were recorded, with 9 occurring in the good PS group and 7 in the poor PS group.

Conclusion: This study reveals a comparable irAE incidence in cancer patients with good and poor PS, except for a higher frequency of cardiac irAEs in the poor PS group. Future survival data comparing poor and good PS patients are crucial for a comprehensive understanding.

Other

Sun-103. Non-Inferiority Trials: A Systematic Review on Methodological Quality and Reporting Standards

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Introduction: With the abundance of novel therapies, non-inferiority (NI) trials are increasing in publication. Prior studies found inadequate quality of reporting of NI studies, but were limited to certain specialties/journals, lacked NI margin evaluation, and did not examine temporal changes in quality.

Research Question or Hypothesis: The methodological quality and reporting of NI trials has improved over time per the 2010 CONSORT NI statement.

Study Design: Systematic review

Methods: A systematic review was conducted utilizing PubMed and Cochrane Library databases. NI trials published in English in 2014 and 2019 were assessed for: study design and NI margin characteristics, primary results, and risk of bias for blinding, concealment, analysis method and missing outcome data.

Results: We included 823 studies. Between 2014 and 2019, a shift from publication in specialty to general journals (15% vs 28%, p<0.001) and from investigating pharmacological to non-pharmacological interventions (25% vs 38%, p=0.025) was observed. The NI margin was specified in most trials for both years (94% vs 95%). Rationale for the NI margin increased (36% vs 57%, p<0.001), but remained low. While clinical judgement remained the most common reason (30% vs 23%), more 2019 articles incorporated patient values (0.3% vs 21%, p<0.001). At least 50% of studies were open-label for both years. Gold standard method of analyses (both per protocol+(modified) intention to treat) declined over time [43% vs 36%, (p<0.001)].

Conclusion: The methodological quality and reporting of NI trials is inadequate but improving in some areas. Improved methods for justification of the NI margin, blinding, and analysis method are warranted to facilitate clinical decision-making.

Peri-Operative Care

Sat-49. Enhanced Recovery After Surgery (ERAS®) Society Visceral Surgery Recommendations: A Systematic Review and Synthesis of Guidelines for Perioperative Pharmacotherapy Elements

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Introduction: The purpose of this systematic review is to generate a summary to harmonize published pharmacotherapy recommendations embedded within ERAS® Society visceral surgery (VS) guidelines. Determining whether a consensus exists for elements would make future guideline preparation for similar surgeries more efficient and consistent.

Research Question or Hypothesis: In which ERAS® pharmacotherapy-related guideline elements has consensus been attained?

Study Design: Systematic Review and Guideline Synthesis

Methods: From the ERAS® Society website up to May 2023, 17 current ERAS® published VS guidelines were included in the analysis to determine consensus and differing statements regarding each ERAS® element. The aims were to (1) determine whether a consensus for each element could be derived, (2) identify gaps in protocol development for pharmacotherapies, and (3) propose potential research directions for addressing the identified gaps in the literature.

Results: Elements with consensus included: preoperative optimization; avoiding mechanical bowel reparation and fasting; multimodal opioid-sparing preanesthetic, perioperative analgesia, and postoperative nausea and vomiting regimens; low molecular weight heparins for in-hospital and at-home venous thromboembolism prophylaxis; antibiotic prophylaxis and skin preparation; goal-directed perioperative fluid management with balanced crystalloids; perioperative nutrition care, ileus prevention with peripherally-acting mu receptor antagonists, and glucose control; and use of antiarrhythmics and magnesium supplementation.

Conclusion: While consensus was found for twelve current ERAS® guideline elements related to pharmacotherapy choice, many of the details related to doses, regimen, timing of administration as well as unique aspects pertaining to specific VS remain to be researched and harmonized to promote guideline consistency and optimized patient outcomes. Specific recommendations for pharmacotherapy should be developed with a focus on providing specific medication regimens instead of general drug classes.

Sat-48. The Use of Protamine for the Management of Post-cardiac Surgery Coagulopathy

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Introduction: Cardiac surgery with cardiopulmonary bypass (CPB) imposes major tissue trauma and activates coagulation. To minimize thrombus formation, large doses of unfractionated heparin are given and subsequently reversed with protamine at CPB conclusion. Heparin rebound contributes to post-operative coagulopathy and is the basis for administering additional empiric doses of protamine. However, minimal literature exists to evaluate the safety and efficacy of this practice. Protamine administration in the absence of heparin can also lead to paradoxical anticoagulation and increased microvascular bleeding.

Research Question or Hypothesis: What is the impact of post-operative protamine administration on chest tube output (CTOP) and activated partial thromboplastin time (aPTT)?

Study Design: This was a retrospective, single-center matched cohort study.

Methods: All adult patients who received protamine once within 8 hours of ICU admission after cardiac surgery with CPB from January 1st 2019 to January 1st 2022 were included. Patients with heart/lung transplant, left ventricular device placement surgery, descending or distal aortic procedures, mechanical circulatory support requirement, hemophilia, Von Willibrand disease, lupus anticoagulant and severe thrombocytopenia on baseline (platelet < 100,000/uL) were excluded. Patients were stratified according to pre-treatment aPTT [minimally elevated aPTT (ME, 33 to ≤ 45 seconds), elevated aPTT (EL, > 45 seconds)] and matched 1:1 based on surgery type, age and time from ICU admission to protamine dose.

Results: After matching, 372 patients were included in the final analysis. Most patients underwent elective cardiac surgery with primary sternotomy. Average CTOP decreased within 2 hours of protamine administration by 15 mL/hr in the ME group and by 11 mL/hr in the EL group. Both groups had normalized aPTT within the same time frame. Elevated aPTT prior to protamine administration was not significantly associated with CTOP decrease in multivariable analysis.

Conclusion: There was no association detected between aPTT subgroup and CTOP decrease within 120 minutes.

Sun -112. Pharmacoprophylaxis in Colorectal Surgery: A Causal Model with Latent Variables

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Introduction: Enhanced Recovery After Surgery (ERAS®) evidence-based principles have demonstrated substantial improvement in patient outcomes, however; prior studies have not examined how the effectiveness of ERAS® interventions is influenced by confounding pharmacotherapy variables, which in turn affect composite outcomes. Addressing this gap is critical for refining ERAS® pharmacotherapy recommendations to advance patient care.

Research Question or Hypothesis: What latent pharmacoprophylaxis variables predict perioperative outcomes?

Study Design: Secondary analysis of a multi-site randomized retrospective cohort study.

Methods: Using R, pharmacoprophylaxis data were modeled from an existing dataset of 476 adult elective colorectal surgery patients during 2021 at 10 US medical centers. Primary outcomes were absence of surgical site infection, venous thromboembolism, and postoperative nausea and vomiting, and Clavien-Dindo (CD) I-II complications. Secondary outcomes included no CD III-V complications, hospital length of stay ≤ 3 days and no readmission at 7 or 30 days.

Results: Patients separated into two latent classes, those with better and poorer primary and secondary outcomes. Pharmacotherapy variables predicting better primary and secondary composite outcomes ($p<0.05$) included scopolamine patch, neostigmine reversal, and intravenous (IV) fluid stop on postoperative day 1 or 2. Variables associated with worse primary and secondary composite outcomes included preoperative iron, aprepitant, gabapentin, and propofol. Postoperative morphine milligram equivalents (MME) < 50 was the only variable with a significant positive association for primary outcomes and a negative association for secondary outcomes. Those with opposite effect on outcomes included preoperative oral antibiotics, ondansetron, and ketamine non-anesthesia bolus. Patients without SSI or VTE had better overall outcomes.

Conclusion: Separating patients into subpopulations and identifying latent class variables predicted postoperative colorectal surgery outcomes. Preoperative oral antibiotics, postoperative MME < 50, ondansetron, and ketamine bolus use led to mixed outcomes. Scopolamine patch, neostigmine, and early IV fluid should be considered for all patients. Additional research on preoperative iron, aprepitant, gabapentin, and propofol for the timing of administration is needed.

Pharmacoeconomics/Outcomes

Tues-109. Daptomycin vs. Vancomycin: a cost comparison in a regional home infusion pharmacy.

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Introduction: Intravenous vancomycin is frequently used to treat complicated infections caused by Gram-positive organisms. Although daptomycin can also be used to treat many of these same infections, the cost of daptomycin has historically made this agent less preferable. Recently, the cost of daptomycin has decreased, raising the question of whether using daptomycin can reduce outpatient cost expenditures for Kaiser Permanente home infusion pharmacies (HIP).

Research Question or Hypothesis: What is the cost of administering and monitoring intravenous vancomycin versus daptomycin through a HIP?

Study Design: This was a multi-center retrospective chart review.

Methods: Adults age ≥18 years prescribed either vancomycin or daptomycin through a HIP for ≥7 days between August 1 - December 27, 2022 were included. Variables extracted through manual chart review included demographic and clinical characteristics, total pharmacist monitoring time, and number of associated monitoring labs. The cost of antibiotics, associated labs, and pharmacist time spent monitoring patients were assessed to infer the total cost per day of therapy (DOT).

Results: 113 patients were included; 56 received daptomycin and 57 received vancomycin. Pharmacists spent less time monitoring patients who received daptomycin compared to vancomycin (14.5 vs. 24.9 minutes per DOT, $p = 0.0051$). Patients who received daptomycin had a similar drug cost per DOT compared to vancomycin patients ($36.63 vs $38.41, $p = 0.5750$). When the cost of drug, pharmacist time, and labs were combined, patients who received daptomycin had a significantly lower mean overall cost per DOT compared to vancomycin patients ($66.47 vs $90.41, $p = 0.0450$).

Conclusion: Daptomycin is less costly for a HIP to administer and monitor than vancomycin. In addition, pharmacists spend significantly less time monitoring daptomycin patients. This information can guide institution-specific practices pertaining to prescribing vancomycin or daptomycin in the outpatient setting.

Pharmacoepidemiology

Tues-19. Low-intensity statin plus ezetimibe versus moderate-intensity statin for primary prevention: a retrospective cohort study in Asian population

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Introduction: Statins may not be utilized at a recommended intensity due to dose-dependent adverse events. Although ezetimibe is often added to a statin for primary prevention, few data on direct comparison of clinical outcomes between a low-intensity statin plus ezetimibe and a moderate-intensity statin is available.

Research Question or Hypothesis: Is there any differences of efficacy and safety between a low-intensity statin plus ezetimibe and a moderate-intensity statin for primary prevention?

Study Design: A population-based retrospective cohort study

Methods: This study used the Korean nationwide claims database (2002–2019). We included adults without atherosclerotic cardiovascular diseases who received a moderate-intensity statin or a low-intensity statin plus ezetimibe. The primary outcome was a composite of all-cause mortality, myocardial infarction, and ischemic stroke. The safety outcomes were liver and muscle injuries and new-onset diabetes mellitus (DM). We used standardized inverse probability of treatment weighting (sIPTW) and propensity score matching (PSM).

Results: In the sIPTW model, 1,717 and 36,683 patients used a low-intensity statin plus ezetimibe and a moderate-intensity statin, respectively. In the PSM model, each group included 1,687 patients. Compared to moderate-intensity statin use, low-intensity statin plus ezetimibe use showed similar risks of the primary outcome (hazard ratio (HR) 0.92, 95% confidence interval (CI) 0.81-1.12 in sIPTW and HR 1.16, 95% CI 0.87-1.56 in PSM model). Low-intensity statin plus ezetimibe use was associated with decreased risks of liver and muscle injuries (subHR (sHR) 0.84, 95% CI 0.74-0.96 and sHR 0.87, 95% CI 0.77-0.97 in sIPTW; sHR 0. 84, 95% CI 0.72-0.96 and sHR 0.82, 95% CI 0.72-0.94 in PSM model, respectively). For new-onset DM and hospitalization of liver and muscle injuries, no difference was observed.

Conclusion: Low-intensity statin plus ezetimibe may be an alternative to moderate-intensity statin for primary prevention.

Pharmacogenomics/Pharmacogenetics

Sun-116. Association of *CYP2C19* genotype on proton pump inhibitor (PPI) adverse events (AE)

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Introduction: Patient risk factors for PPI-associated AEs beyond PPI dose and therapy duration have not been well defined but could help personalize treatment decisions to reduce AE risk. Genetic variation in

CYP2C19 is a known contributor of variation in PPI exposure and response, especially for 1st generation PPIs. Patients with decreased CYP2C19 activity have significantly higher PPI exposure and greater acid suppression but it remains unclear if this contributes to AE risk.

Research Question or Hypothesis: Decreased CYP2C19 activity will increase PPI-associated AEs.

Study Design: Retrospective review

Methods: Patients who received at least 30 consecutive days of PPI with biorepository genetic data were included. New diagnoses of bone fracture(BF), hypomagnesemia(HM), pneumonia(PNA), and *Clostridioides difficile* infection(CDI) during or within 14 days of PPI use were extracted. CYP2C19 activity was defined as increased, normal, or decreased based on genotype in accordance with CPIC guidelines. PPI agent and total daily dose were captured and classified by generation and intensity. AEs were evaluated across CYP2C19 activity, PPI generation, and dose intensity via Chi-squared test. Cumulative days of PPI were compared between patients with and without AE.

Results: We included 12625 patients; 92% received a 1st generation PPI and 38.8% had normal CYP2C19 activity. AEs occurred in 4.4% of patients. CYP2C19 activity was not associated with BF, HM, or PNA. CDI rates were highest in patients with decreased CYP2C19 activity, especially when considering only 1st generation PPIs (OR:1.5;95%CI:1.1-2.1). High intensity PPI increased risk of pneumonia (OR:3.9;95%CI:2.0-7.6), CDI (OR:1.7;95%CI:1.2-2.5), and HM (OR:1.9;95%CI:1.3-2.7). Patients with AEs had higher median cumulative days of therapy (1216(529-2234) vs. 610 (245-1458);p<0.01).

Conclusion: *CYP2C19* genotype may help identify patients with higher CDI risk when receiving 1st generation PPI therapy. PPI discontinuation or using a 2nd generation PPI could be evaluated in future trials as potential strategies to reduce risk of developing CDI.

Pharmacokinetics/Pharmacodynamics/Drug Metabolism/Drug Delivery

Mon-121. Results from phase 1 single and multiple ascending dose studies characterizing the pharmacokinetics, pharmacodynamics, and safety of the ITK and JAK3 investigational inhibitor ATI-2138 in healthy volunteers

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Introduction: ATI-2138 is an investigational inhibitor of interleukin 2-inducible T cell kinase (ITK) and Janus kinase (JAK) 3 in development for the treatment of T cell–mediated autoimmune diseases.

Research Question or Hypothesis: To evaluate the safety, tolerability, pharmacokinetics (PK), and pharmacodynamics (PD) of ATI-2138 in healthy subjects.

Study Design: Phase 1 double-blind, placebo-controlled single (SAD) and multiple ascending dose (MAD) studies.

Methods: Eligible subjects between 18 and 55 years were randomized to receive a single oral dose of 1, 3, 5, 15, 25, 50, or 80 mg of ATI-2138 or placebo (SAD) or 5, 15, 25, or 40 mg ATI-2138 twice daily, 30 mg once daily, or 10 mg 3 times daily or placebo for 14 days (MAD). Blood samples for PK and PD measurements were collected predose and at multiple time points through 48 hours postdose (SAD) and predose and at multiple time points through 24 hours postdose on days 1, 7, and 15 (MAD). The PD effects of ATI-2138 were evaluated using ex vivo stimulation assays to assess the inhibition of the ITK and JAK3 pathways. Safety and tolerability were assessed by adverse events (AEs), clinical laboratory values, vital signs, and electrocardiograms.

Results: Sixty-three subjects completed the SAD study and 57 completed the MAD study. There were no deaths, serious AEs, or discontinuations due to AEs. Plasma concentrations of ATI-2138 increased in a dose-dependent manner. Peak concentrations were reached within 2 hours after dosing. ATI-2138 caused dose- and time-dependent modulation of all PD biomarker readouts (αCD3/αCD28 stimulated interleukin [IL]-2 and interferon [IFN]γ mRNA levels, IL-15 stimulated and αCD3/IL-15 stimulated IFNγ protein production). Near-complete inhibition of biomarker readouts was observed 2 hours post–ATI-2138 treatment at doses of 15 mg to 80 mg.

Conclusion: ATI-2138 was well tolerated and resulted in dose-dependent increases in plasma ATI-2138 and PD effects consistent with the inhibition of ITK and JAK3.

Rheumatology

Sat-57. Patient-based benefit-risk assessment of DMARDs in the treatment of rheumatoid arthritis at different stages of the disease journey

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Introduction: Management of rheumatoid arthritis (RA) requires monitoring and potential multiple adjustments of disease-modifying antirheumatic drugs (DMARDs) therapy to achieve disease control. As part of this process, it is unclear how patients assess the benefits and risks of DMARDs at different stages of their disease journey.

Research Question or Hypothesis: To elicit RA patients' preferences for attributes of DMARDs and evaluate the changes of these preferences across the disease journey.

Study Design: Single-center cross-sectional study, using multidimensional unfolding approach.

Methods: RA patients from the Princess Alexandra Hospital, Brisbane, Australia were asked to rank DMARDs attributes according to importance for them personally. Attributes included: RA overall disease improvement, RA symptoms and functional improvement, risk of serious infections, risk of other serious side effects, and route and frequency of administration. Sub-group analysis versus the overall cohort was performed according to three predefined dimensions of disease journey: disease duration, disease severity, and previous treatment experience.

Results: 62 patients were included; mean age was 53 years and 66% were female. RA disease improvement was the most important attribute for the overall cohort (50%), followed by symptoms and functional improvement (21%), risk of serious side effects (19%), and risk of serious infections (8%). Route and frequency of administration was the least important attribute (2%). The risk of serious side effects was the most important attribute for participants with early RA (50%, p=0.033 versus overall cohort). It was also highly ranked by treatment-naïve participants (38%, p=0.039 versus overall cohort). For participants with low disease activity, RA symptoms and functional improvement was highly preferred (36%, p= 0.041 versus overall cohort). **Conclusion:** RA patients' perspectives and risk tolerance change across their disease journey. Patients in early RA are particularly risk averse and may miss the narrow therapeutic window. Pharmacists are ideally positioned to provide targeted education for such patients about the safety profile of their prescribed DMARDs.

Substance Abuse/Toxicology

Tues-122. High-Risk Opioid Prescribing Trends among Pediatric Patients in California (2010-2021)

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Introduction: In 2022, the CDC updated clinical practice guidelines for opioid prescription in pain management. However, these guidelines didn't address opioid use in pediatrics. Given the lack of evidence, evaluating high-risk opioid prescribing patterns in pediatric patients becomes essential.

Research Question or Hypothesis: Our study aimed to examine high-risk opioid prescription patterns among pediatric patients aged 2-21in 2010-2021.

Study Design: This cross-sectional study employed data from the California Prescription Drug Monitoring Program (PDMP).

Methods: We assessed opioid dispensing rates, dosage, and treatment duration across five age groups (2-5, 6-9, 10-14, 15-19, and 20-21 years). High-risk opioid prescribing was measured by persistent use (>30 days), high-dosage opioids (≥50 morphine mg equivalents/day), multiple providers episodes (>2 prescribers/pharmacies within 30 days), therapy duration> 7 days for opioid-naïve patients, and concomitant opioid-benzodiazepine use. Joinpoint regressions were applied for trend analysis.

Results: The study encompassed 4,049,729 pediatric patients in California receiving opioid prescriptions from 2010 to 2021. Opioid dispensing rates demonstrated a substantial decline since 2019, indicating an annual percent change (APC) of 7.77% (p<0.05). Opioid prescription dosage exhibited a consistent decrease over the study duration. The mean days of prescribed opioids per patient increased during 2013-2016 and then decreased during 2016-2021. Persistent opioid use peaked in 2012-2016 and declined in 2016-2021. High-dosage opioid usage decreased in all age groups except 6-9 years, with an APC of -7.12% from 2010 to 2015. Multiple provider episodes increased (APC=32.9%, P<0.05) during 2010-2012 and subsequently decreased since 2012 (APC=-1.13%, P<0.05). Therapy duration >7 days for opioid-naïve patients rose significantly (APC=15.71%, P<0.05) during 2012-2016, then dropped since 2016 (APC=-14.13%, p<0.05). Concurrent opioid-benzodiazepine use decreased in all age groups post-2016 except for 2-9 years.

Conclusion: Opioid dispensing rates among pediatric patients in California decreased since 2019. High-risk opioid prescription patterns have generally decreased since 2016, except for high-dosage opioids.

Mon-129. Internal Medicine and Emergency Medicine Provider Perceptions of a Pharmacist-Driven Opioid Use Disorder Medication-Assisted Recovery Inpatient Consult Service

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Introduction: Despite 2.5 million adults in the US with opioid use disorder (OUD) in 2021, limited treatment services are available in inpatient settings. The University of Illinois Hospital implemented a pharmacist-driven, interprofessional OUD medication-assisted recovery (MAR) inpatient consult team to increase access and support providers in delivering comprehensive OUD care.

Research Question or Hypothesis: What are internal medicine (IM) and emergency medicine (EM) provider perceptions of the OUD MAR consult service?

Study Design: Single-center, descriptive cohort study

Methods: EM/IM providers (residents, attendings, and nurse practitioners) were invited via hospital listservs to complete an anonymous 14-item Qualtrics™ survey assessing consult service utilization and

perceptions with 5-point Likert-type and free response questions. The primary outcome was EM/IM provider service satisfaction. Secondary outcomes included agreement with pharmacist-driven OUD MAR services, barriers and facilitators to consultation, and perceived patient outcomes. Descriptive statistics were used to analyze data utilizing IBM SPSS Statistics v26 (Armonk, NY).

Results: Forty-eight EM and 19 IM providers responded. Twenty-eight (58%) EM respondents utilized the OUD MAR consult service compared to all 19 IM respondents. All 28 EM respondents who consulted the service reported being satisfied or very satisfied with service recommendations, compared to 15 (79%) IM respondents. All EM respondents and 73% of IM respondents agreed or strongly agreed that pharmacists driving OUD MAR consult services is appropriate. Key barriers included comfort providing OUD care independently, and lack of patient interest. Most (90%) EM respondents who had not utilized the service were unaware it existed. Key facilitators included improved outpatient service coordination and greater OUD MAR expertise. Nearly 95% of IM respondents agreed or strongly agreed that the service's recommendations improved their patients' OUD care.

Conclusion: Despite satisfaction with OUD MAR consult services among EM/IM providers, key barriers to service utilization were identified including lack of awareness, indicating a need for continued outreach and prospective patient identification.

Tues-120. Pharmacist-Driven Inpatient Opioid Use Disorder Medication Assisted Recovery (OUD MAR) Consult Service: A Year in Review

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Introduction: Nearly 2.5 million adults in the US had opioid use disorder (OUD) in 2021 and only 22.3% received medications for OUD (MOUD). The University of Illinois Hospital & Health Sciences System implemented an inpatient pharmacist-driven, interprofessional OUD medication-assisted recovery (OUD MAR) consultation team to provide comprehensive medication management for OUD and linkage to ongoing treatment upon discharge.

Research Question or Hypothesis: What is the impact of a pharmacist-driven inpatient OUD consult service within an academic medical center?

Study Design: Single-center, retrospective, observational study

Methods: Patients were included if they received an OUD MAR consultation between July 7, 2022 and June 30, 2023 and excluded if no OUD MAR service was received. The primary outcome included comprehensive medication management recommendations, and secondary outcomes included patient-reported MOUD history, time to consult, service utilization, and MOUD follow-up coordination and completion. Descriptive statistics were used for data analysis.

Results: In the first year, 285 OUD MAR consultations were completed for 221 unique patients. The average patient was 51 (±14 SD) years old and male (61%). Pharmacists initiated MOUD for 110 patients [71 (25%) methadone and 39 (14%) buprenorphine/naloxone] and held MOUD for 50 (18%) patients for further evaluation. Approximately 31% were taking MOUD before admission for a median of 12 (IQR=20) months. Over half (53%) of patients had previously used MOUD. Consults were initiated a median of one (IQR=2) day following admission, predominantly by the internal medicine (39%), specialty (25%), and critical care services (17%). One-hundred eighty-three (72%) patients agreed to and received MOUD follow-up coordination, of which 34% completed follow-up within 30 days of discharge.

Conclusion: The inpatient pharmacist-driven OUD MAR consultation service provided access to comprehensive medication management and MOUD follow-up coordination.

Tues-121. Use of a phenobarbital fixed-dose protocol for alcohol withdrawal in medical floor patients compared to symptom-triggered benzodiazepines with a Clinical Institute Withdrawal Assessment Alcohol Scale Revised (CIWA-Ar) protocol

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Introduction: Phenobarbital has been demonstrated as a safe and effective alternative to benzodiazepines for alcohol withdrawal management. However, published data is lacking for the use of phenobarbital in patients admitted to the medical floor.

Research Question or Hypothesis: Is a phenobarbital fixed-dose protocol a safe and effective alternative to symptom-triggered benzodiazepines using a CIWA-Ar protocol in the management of alcohol withdrawal in medical floor patients?

Study Design: A retrospective chart review of patients admitted to the medical floor for acute alcohol withdrawal who received either a phenobarbital fixed-dose protocol or benzodiazepines with CIWA-Ar. Patients were excluded if they were younger than 18 years old or if they received both treatment modalities.

Methods: The primary outcome was to compare length of stay (LOS). Secondary outcomes included new delirium tremens (DTs), need for transfer to the intensive care unit (ICU) after initiation and other safety endpoints. Additional data collected: demographics, incidence of bradycardia, increased oxygen requirements and seizures. Data was analyzed using Statistical Package for the Social Sciences (SPSS) v28. An alpha of 0.05 was used and tests used included Fisher's Exact or X2, Mann-Whitney U, and student's t-test.

Results: The patient demographics between the phenobarbital (n=58) and CIWA-Ar (n=255) groups were similar. The median LOS (70 vs. 79 hours, p=0.165) and the rate of ICU transfer after therapy initiation (3.4% vs. 5.9%, p=0.748) was similar between the two groups. The phenobarbital group was associated with lower rates of new DTs after initiation (0% vs. 28.2%, p<0.0001). Other safety endpoints were similar except increased oxygen requirements, which was lower in the phenobarbital group (0% vs. 12%, p=0.0024).

Conclusion: A phenobarbital fixed-dose protocol is as effective as benzodiazepines with CIWA-Ar for alcohol withdrawal in patients admitted to the medical floor and may reduce the risk of adverse outcomes, including new DTs.

Mon-26. Expanding Healthcare Professional Student Learning Surrounding Substance Use Disorders

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Introduction: The opioid crisis remains a significant public health concern in the United States, with escalating rates of overdose and poisoning. However, healthcare professional schools have limited curricular time to address this issue. In response, faculty at Roseman University and Touro University have developed an Interprofessional Education (IPE) annual event to improve student understanding and comfort levels in addressing substance use disorder (SUD) and providing overdose/poisoning prevention.

Research Question or Hypothesis: The purpose of this study is to evaluate the effect of a SUD focused IPE education by measuring healthcare professional student comfort levels regarding overdose prevention and SUD treatment.

Study Design: An anonymous cross-sectional study was conducted using pre- and post-IPE surveys in Qualtrics.

Methods: In 2022 and 2023, IPE students from 4 healthcare programs (Pharm.D., Nursing, PA and DO) were invited to complete surveys rating their comfort level with counseling on naloxone, initiating critical conversations, and familiarity with community resources (Likert scale 1-5). Pre- and post-IPE results were compared from year to year and by program, using SPSS v29, with an alpha of 0.05 for superiority.

Results: Each year, over 245 healthcare professional students participated in the SUD-focused IPE event. All survey response rates were over 50%. Over 60% of respondents were female and about one-third were from Pharm.D. In both years, the highest improvement was seen in familiarity with community resources for SUD (1.03, CI 0.81-1.25) and comfort in naloxone counseling (0.8, CI 0.59-1.01). Increases were also seen with comfort levels in initiating conversations with high risk patients (0.58, CI 0.39-0.75) and patients with OUD (0.56, CI 0.37-0.75). Significant increases were observed across all programs ($p < 0.05$).

Conclusion: IPE continues to be a great opportunity to impact future health professionals' comfort levels in initiating critical conversations surrounding substance use, providing overdose prevention counseling, and increasing awareness of community resources.

Mon-25. Reducing stigma toward substance use disorders among future healthcare professionals

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Introduction: The opioid crisis remains a significant public health concern in the United States, despite effective treatment and recovery care options. Negative perceptions of healthcare professionals toward patients with substance use disorders (SUD) are common and well-documented to correlate with reduced quality and care access. To improve health equity, RUCOP and TU faculty designed and facilitated an Interprofessional Education (IPE) event using an interdisciplinary team to care for individuals with SUD.

Research Question or Hypothesis: The Medical Condition Regard Scale (MCRS) was used to assess anticipated reduction in stigma towards SUD, where higher scores indicate lower stigma.

Study Design: Anonymous cross-sectional study

Methods: PRE- and POST-IPE surveys, including the 11 MCRS items, were completed with Qualtrics. Using a 6-point Likert scale for each question, scores were compared PRE- and POST-IPE training and by program, using SPSS v29 (alpha set to 0.05).

Results: In 2023, 257 healthcare students attended the IPE, with 184 (71.6%) completing the PRE- and 172 (66.9%) completing the POST-IPE survey. Mean age was 28 years, 60% were female, and 38% were pharmacy, 33% physician assistant (PA), 15% nursing (BSN), and 14% doctor of osteopathic medicine (DO) students.

Mean MCRS overall was 48.3 PRE-IPE compared to 52.2 POST-IPE (mean difference 3.87; 95% CI, 2.14 – 5.61; $p < 0.01$). At baseline, pharmacy students reported higher MCRS (51.5) than both BSN (45.7) and PA (46.8) students, but no difference with DO (47.4) students. With respect to POST-IPE results, MCRS continued to remain highest

in pharmacy students (54.4) than other programs (BSN 51.6, PA 50.3, DO 50.9), however, this was not statistically significant ($p = 0.053$).

Conclusion: Overall, the IPE was successful in reducing stigma as demonstrated by increased MCRS scores from baseline. Pharmacy students show lowest level of stigma both before and after IPE training, supporting their inclusion in an interdisciplinary team, to reduce stigma and improve patient-centered care.

Tues-119. Providing Medication-Assisted Recovery via Low Barrier Buprenorphine from a Mobile Medical Unit in Chicago: A Two-Year Review

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Introduction: Started in 2021, the Community Outreach Intervention Projects Mobile Unit is a collaboration between a harm reduction program and opioid treatment program that integrates clinical pharmacists and provides medication-assisted recovery (MAR) via low barrier buprenorphine and primary care with harm reduction services in Chicago. In 2022, the Mobile Unit began dispensing buprenorphine in premade packs with up to 24 mg of buprenorphine daily in two-, three-, and seven-day supplies.

Research Question or Hypothesis: What is the impact and landscape of a Mobile Unit providing MAR, primary care, and harm reduction services?

Study Design: Retrospective cohort study

Methods: A chart review was conducted for all patients seen on the Mobile Unit between July 1, 2021 and June 30, 2023. The primary outcomes included the patient landscape and services provided. Secondary outcomes included patient-reported substance use history and reasons for not dispensing buprenorphine.

Results: A total of 1,085 unduplicated patients were seen across 2,381 visits. The typical patient was Black (61.9%), male (68.3%), and 46.5 years old (mean, SD 12.6). Approximately half were initial (45.1%) and follow-up visits (54.9%). Common services were MAR (64.8%, n=1543), COVID-19 vaccination (18.1%, n=430), wound care (11.0%, n=261), medication refill (10.2%, n=244), and COVID-19 testing (8.7%, n=206). Of the 571 patients seen for MAR, 75.9% used opioids via insufflation only, 16.3% via multiple routes, and 5.8% via injection only. Nearly 93% had documented polysubstance use. On average, patients used 5.2 bags of heroin daily for 19.2 years. When buprenorphine became available, over half of patients (54.4%, n=229) received buprenorphine across 451 visits. Most common reasons for not dispensing buprenorphine on days it was available included indication for shorter duration (5.6%, n=37), indication for longer duration (3.2%, n=21), and premade pack dosing was inappropriate for the individual (1.8%, n=12).

Conclusion: The Mobile Unit provided low barrier access to buprenorphine to underserved populations in Chicago.

ORIGINAL RESEARCH

ADR/Drug Interactions

Tues-2. The association of adverse events between Janus Kinase Inhibitors users with or without drug-drug interaction: a real-world evidence from a multi-institutional database in Taiwan

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Introduction: Janus kinase inhibitors (JAKi), types of immunomodulatory drugs, are primarily metabolized by cytochrome P450 (CYP) enzymes, which are important determinants of drug interactions.

Research Question or Hypothesis: This study aimed to estimate the adverse events (AEs) among patients treated with JAKi with or without drug interaction.

Study Design: This is a retrospective observational study using a multi-institutional electronic medical database.

Methods: Patients newly received JAKi from January 2015 to April 2022 and had at least one clinic visit during the past year were included. During JAKi treatment, patients with more than one day of overlapping any interacted medication were defined as the drug-interaction group. Drug interaction severity and possible AEs were further assessed using the Lexicomp database. Based on the database, medications causing drug-drug interactions were classified into CYP enzyme moderate inhibitors, weak inhibitors, and no drug-drug interaction groups. Eligible patients were tracked for a year to monitor potential AEs, including embolism and thrombosis, musculoskeletal tissue disorders, neutropenia, and thrombocytopenia. These AEs were identified by examining levels of D-dimer, creatinine kinase (CK), white blood cell (WBC) counts, and platelet counts, respectively, from patients' laboratory data.

Results: A total of 1208 patients (251 in baricitinib, 856 in tofacitinib, and 101 in the upadacitinib group) were included in this study, and 24% (n=290) reported AEs. Overall, 74.3% (n=898) were female, with an average age being 55.0 (SD: 15.0). The results showed the combination of JAKi and CYP enzyme inhibitors was associated with a significantly increased risk of higher D-dimer levels (odds ratio [OR]:

4.70, 95%confidence interval [C1]:1.03-21.3), whereas those of higher CK levels (OR: 2.85, 95% CI: 0.64-12.7), decreased WBC counts (OR 2.90; 95% CI: 0.94-8.92), and decreased platelet levels (OR 1.97; 95% CI: 0.56-6.89) were relatively insignificant.

Conclusion: This study demonstrated that patients being treated together with JAKi and CYP enzyme inhibitors were associated with an increased risk of AEs.

Sat-1. Analysis of gabapentin adverse events and misuse reported through tweets: a feasibility study

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Introduction: Adverse event (AE) reporting occurs through the FDA Adverse Event Reporting System (FAERS), although data submitted are not always reflective of the full AE landscape. Social media can offer additional safety surveillance from the patient perspective, particularly for medications with a misuse risk, such as gabapentin, or for AEs not reported to FAERS.

Research Question or Hypothesis: Describe patterns related to gabapentin AEs and misuse via user-generated Twitter data.

Study Design: Retrospective cross-sectional (January 2012 to September 2022)

Methods: Tweets were collected from SafeRx, a curated, comparative database utilizing a natural language processing engine to identify tweets related to a potential AE. De-identified English-language tweets collected from public accounts, relating to an identifiable person/use episode, which mentioned gabapentin were included. Researchers individually assessed each potentially AE-related tweet identified by SafeRx for: (1) confirmed presence of an AE, (2) presence of intentional misuse, (3) type of misuse (therapeutic, non-therapeutic, or diversion), (4) type of AE (gastrointestinal, cognitive, neurological, psychiatric, withdrawal, overdose), and (5) mention of other drugs/substances. A consensus process was performed to consolidate assessments on each tweet. Tweets with less than 50% consensus as to the presence of AE, duplicate tweets, and tweets about animal usage were excluded. Descriptive analysis (using Microsoft Excel; Redmond, WA) was performed.

Results: Overall, 7113 tweets related to gabapentin were analyzed, with 6285 (88.4%) included for analysis. A total of 4255 (67.7%) tweets identified an AE, with the most common type being neurological (1675; 39.4%). Intentional misuse was identified in 278 (4.4%) tweets, with the type most discussed being non-therapeutic (167; 60.1%). A total of 1187 (18.9%) tweets discussed the use of gabapentin with/alongside another drug/substance.

Conclusion: Data from Twitter suggests a high prevalence of gabapentin tweets related to AEs. Continuing work will correlate data from Twitter to that available from FAERS.

Mon-4. Comparison of Drug Interaction resources - nimatrelvir-ritonavir evaluation

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Introduction: Nirmatrelvir/ritonavir (Paxlovid™) is approved for the treatment of COVID-19. It is associated with clinically significant drug interactions (DI). Several DI resources are available to aid healthcare providers in the clinical management of these patients. Clinicians should be aware of the advantages and limitations of these resources.

Research Question or Hypothesis: The study aims to determine the consistency among DI resources with respect to scope, severity, completeness, and recommendations provided.

Study Design: cross-sectional, quantitative analysis

Methods: Drug-drug interaction pairs were identified based on questions received from the institution's Paxlovid™ Hotline. DIs with nirmatrelvir/ritonavir were analyzed by two independent reviewers using five resources: Lexicomp Interactions, Micromedex Drug Interactions, Paxlovid™ Prescribing Information (PI), University of Liverpool COVID-19 Drug Interaction Checker (Liverpool), and the Ontario/University of Waterloo COVID-19 Advisory Table (Ontario). Resources were evaluated for presence of an interaction, severity, completeness, and clinical management. Scales used in the evaluation were adapted from previous literature. Data analysis included descriptive statistics and correlation coefficients.

Results: Of the 102 DI pairs identified, there were 30 common to all five resources. Liverpool contained the most DIs (92%) followed by Lexi (63%), Micromedex (62%), PI (41%) and Ontario (38%). Resources were most similar in severity score. Lexicomp severity levels were highly correlated with three resources (r=0.74-0.75) and to a lesser extent with Micromedex (r=0.54). Completeness scores poorly correlated among resources with Lexi scoring the highest (92%) compared to other resources; Liverpool (59%), Micromedex (57%), Ontario (33%) and PI (5%). Recommendations varied among resources (r=0.44-0.77). The most common recommendation for four references was to give nirmatrelvir/ritonavir while either holding, adjusting, or monitoring the other drug. Liverpool mostly recommended continuing nirmatrelvir/ritonavir therapy without modification, possibly due to its inclusion of more minor DIs.

Conclusion: There are considerable inconsistencies among the DI resources. Such variability could have deleterious effects on patient safety. Clinicians should consult multiple resources when evaluating nirmatrelvir/ritonavir DIs.

Mon-45. Drug interactions with continuous glucose monitors in tertiary drug information resources

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Introduction: Continuous glucose monitoring (CGM) devices are alternatives to traditional glucose monitoring, and several devices are currently available on the market. Certain drugs affect CGM blood glucose readings. The availability of these drug-device interactions in tertiary drug information resources is unknown.

Research Question or Hypothesis: How frequently are drug-device interactions with continuous glucose monitors documented in tertiary drug information resources?

Study Design: A descriptive, cross-sectional study analyzing CGM drug-device interactions in tertiary drug information resources.

Methods: CGM devices currently on the market were determined, and their user guides were examined for any information on drug-device interactions. Primary literature on drug-device interactions was assessed to uncover additional interacting drugs. After compiling a list of interacting drugs, available tertiary drug information resources were explored to see if they contained documentation for the drug-device interactions with CGM devices. The tertiary databases explored included: Lexicomp, Clinical Pharmacology, Daily Med, Drugs.com, Micromedex, Epocrates, Clin-Alert and FDA MedWatch. These databases were chosen based upon the Drug Information Handbook list of tertiary resources.

Results: Eight medications were identified to interact with CGM devices: acetaminophen, aspirin, ascorbic acid, hydroxyurea, mannitol, sorbitol, tetracyclines, and dexamethasone. Of the eight databases explored, only Micromedex and Clin-Alert listed drug-device interactions. Micromedex only listed interactions for two of the eight (25%) interacting medications: aspirin and ascorbic acid. Clin-Alert listed interactions for one medication (12.5%), acetaminophen. The tertiary drug information resources did not specify which CGM devices were affected by the drug-device interaction.

Conclusion: Despite these interactions between common medications and CGM devices being listed on the manufacturer sites or in the user guides for the CGM devices, these interactions are not sufficiently reported in tertiary drug information resources. Drug-device interactions should be added to drug monographs in tertiary drug information resources.

Sun-4. Online Machine Learning-based Progressive Drug Surveillance For Predicting Sunitinib- And Sorafenib-induced Thyroid Dysfunction: A Multicenter Retrospective Study

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Introduction: Machine learning with time series data, unlike one-snap data collection, predicts sunitinib- and sorafenib-induced thyroid dysfunction on a real-time basis to aid the cancer therapy race against time.

Research Question or Hypothesis: The study purpose was to develop machine learning models for sunitinib- and sorafenib-induced thyroid dysfunction using time-series data collection with threshold adjustment and web-based application.

Study Design: This retrospective study included patients newly prescribed sunitinib or sorafenib from the de-identified clinical research database of Taipei Medical University.

Methods: Time-series data of derivation and temporal validation cohorts were collected at baseline, and in the 1 st , 2 nd , 3 rd , 4 th , 5 th , 6 th , 9 th , 12 th , 18 th , 24 th , 30 th , and 36 th months after the index date. Logistic regression, random forest, Adaptive Boosting, Light Gradient Boosting Machine, and Gradient Boosting Decision Tree were employed. Performance was compared by accuracy, precision, recall, f1 score, the area under the receiver operating characteristic curve, and the area under the precision-recall curve. The optimal threshold was selected based on the maximum f1 score, and the model was further integrated into a web-based application.

Results: The training cohort contained 609 patients, with 8.54% of cases, whereas 8.08% of cases occurred in the temporal validation cohort of 198 patients. The Gradient Boosting Decision Tree without resampling outperformed other models, with an AUPRC, AUROC, and f1 score of 0.60, 0.88, and 0.583, respectively. Higher cholesterol levels, longer days of medication use, and clear cell adenocarcinoma increased the risk of thyroid dysfunction. A web-based application was developed with predictive probability generated by the model.

Conclusion: The best-performing Gradient Boosting Decision Tree without resampling model with time-series data can serve as an online progressive drug surveillance system for predicting sunitinib- and sorafenib-induced thyroid dysfunction.

Adult Medicine

Sat-4. Impact of Patient Assistance Programs in Pharmacist Managed Patients with Diabetes

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Introduction: Affordability of diabetic medications is recognized as a consistent barrier associated with poor patient outcomes. Clinical pharmacists working in outpatient clinics can improve medication access for a subset of low-income patients through enrollment in patient assistance programs (PAP).

Research Question or Hypothesis: Does the usage of PAP impact patient accessibility of diabetes medications to meet American Diabetes Association Standards of Care goals?

Study Design: Pharmacists aided eligible patients with type 2 diabetes mellitus to enroll in PAP from at least one of five different pharmaceutical companies enabling access to an SGLT2 inhibitor, GLP-1 receptor agonist and/or insulin. Patients sought assistance to 1) continue a medication no longer affordable for them (Existing Medication - EM), 2) start a new unaffordable medication (New Medication – NM) or 3) both continue an existing medication and start new medication concurrently (New and Existing Medication – NEM).

Methods: Retrospective chart reviews were conducted for each group to collect the primary objective measure of A1c reduction at baseline, 6 months, and 12 months after being enrolled in the PAP. Secondary outcomes explored number of cardiovascular protective medications, renal protective medications, hypoglycemic potential medications, and weight changes.

Results: The cohort included 59 patients averaging 69 years old with a baseline A1c of 8.5% and taking approximately twelve total (including two diabetes specific) medications at baseline. The average mean change from baseline A1c to 12 months was -0.9%, -2.27%, and -0.98% for the EM, NM, and NEM groups respectively. All groups were associated with increased use of cardiovascular and renal protective medications, reduced usage of hypoglycemic potential medications and decrease in weight.

Conclusion: Utilizing PAP to improve patient access to costly diabetes medications enables better outcomes as shown by significantly improved A1c levels. Pharmacists involved in diabetes management clinics should consider this benefit when assessing patient barriers to care.

Mon-6. Evaluation of epoetin alfa-epbx dosing strategies in acutely ill hospitalized patients

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Introduction: Erythropoiesis-stimulating agents (ESAs) are part of guideline-directed management of anemia in chronic kidney disease. Documented benefits of ESAs therapy include improved quality of life, physical function, and reduction in packed red blood cell (PRBC) transfusions. Despite ESAs being commonly prescribed, there is a lack of literature regarding optimal dosing in acutely hospitalized patients.

Research Question or Hypothesis: What is the efficacy and safety of different epoetin alfa-epbx (EPO) dosing strategies among acutely ill hospitalized patients?

Study Design: Single-center, retrospective chart review.

Methods: Patients were included if they had hospital length of stay (LOS) ≥ 3 days, were diagnosed with anemia, and received ≥ 2 doses of EPO. Patients were categorized according to EPO dose: group 1 (≤ 100 units/kilogram/dose), group 2 (101-200 units/kilogram/dose), and group 3 (≥ 201 units/kilogram/dose). The primary efficacy outcome was an absolute change in hemoglobin (Hb). Chi-Square and Kruskal-Wallis tests were used for categorical and continuous variables, respectively. Statistical significance was considered at a p-value of <0.05. All analyses were performed using SPSS.

Results: A total of 734 eligible patients were included. The primary efficacy outcome of absolute median change in Hb was 0.03 g/dL, 0 g/dL, and 0.20 g/dL *($p=0.0016$)* for groups 1, 2, and 3, respectively. There were differences in relative median change in the last known Hb *($p=0.002$)*, absolute median change in the last known Hb *($p=0.002$)*, proportion of patients requiring PRBC transfusions *($p=0.003$)*, and median dose of EPO expressed in units/kilogram *($p<0.001$)*. However, there were no differences in the secondary safety endpoints of composite new onset of thrombotic and vascular events *($p=0.665$)* and length of stay *($p=0.957$)*.

Conclusion: In this study of anemic hospitalized patients, a higher EPO dosing strategy compared to a lower one resulted in statistically significant, albeit clinically minor increases in Hb levels, with no benefit on the rate of PRBC transfusions.

Sat-5. Examining the Relationship Between Poorly Controlled Diabetes Mellitus and Fracture Risk in Osteoporosis Patients

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Introduction: Diabetes mellitus (DM) and osteoporosis are two chronic conditions impacting 37.3 million and 10 million American adults, respectively [1,2]. Adults with DM are at increased risk of fractures, despite DM individuals having higher bone mineral density (BMD) [3,4]. However, the relationship between adults specifically with poorly controlled DM and fracture risk is not abundantly defined in current literature.

Research Question or Hypothesis: How does poorly controlled DM contribute to fracture risk in osteoporosis patients?

Study Design: This cross-sectional study utilized data collected from the 2017-2018 National Examination Survey (NHANES) dataset.

Methods: Patients 50 years and older with a diagnosis of both DM and osteoporosis were included. For the exposure, poorly-controlled DM defined as A1C > 7.0% and fasting blood glucose (BG) > 130 mg/dL compared to controlled DM A1C ≤ 7.0% and BG ≤ 130 mg/dL[5]. The outcome was measured by the occurrence of hip or wrist fracture[4]. Multivariable logistic regression was conducted using SPSS. Chi-Square tests were used to obtain *p*-values for categorical data with values greater than five.

Results: The number of poorly-controlled DM and controlled DM patients were 46 and 66 respectively. Of the poorly controlled DM group, 30 (65.2%) patients experienced the outcome of hip or wrist fractures while only 35 (53.0%) patients of the controlled group experienced the outcome (p-value = 0.199). In patients with osteoporosis, poorly controlled DM participants were 68.7% more likely

(OR = 1.687) to experience fractures compared to controlled DM, however these results were statistically insignificant (*p*-value = 0.317).

Conclusion: Our results suggest a statistically insignificant association between poorly-controlled diabetes and increased fracture outcomes. Additional studies with stronger causative design and larger sample size are needed to further examine whether poorly-controlled DM and fracture outcomes for those with osteoporosis are related.

Sat-6. Administrative time availability in health-system clinical pharmacist workflows: a nationwide survey

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Introduction: Health-systems pharmacists are responsible for numerous tasks throughout their workdays. These non-patient care tasks have contributed to burnout and premature attrition from the profession. One modifiable factor from the health-system perspective is allotting administrative time for pharmacists to complete non-patient care related tasks.

Research Question or Hypothesis: Are health-systems pharmacists given dedicated administrative time to complete non-patient care tasks?

Study Design: Survey

Methods: A survey was distributed to health-systems pharmacists nationwide. After one month, the data was extracted and analyzed by the study team. The primary endpoint was the percentage of pharmacists reporting administrative time availability at their practice site. Secondary endpoints included amount of administrative time per pharmacist, non-patient care responsibilities, and site-specific availability of an administrative time standard operating procedure.

Results: 303 pharmacists responded to the survey. Most pharmacists reported working in academic medical centers (n=138, 45%), community hospitals with hospitalists (n=61, 20%), or teaching teams (n=57, 18%). Clinical specialist was the most common job title reported (n=163, 53%), with greater than 10 years of experience (n=132, 43%). The primary endpoint, percentage of pharmacists reporting administrative time availability, was 34.9% (n=105). Many of these pharmacists reported one administrative day per week (n=27, 25%) and few had a formalized standard operating procedure at their site (n=288 answered "no", 95%). Various non-patient care tasks reported included committee membership (n=256, 85%), precepting students (n=268, 88%) and PGY1 residents (n=250, 82%), quality improvement projects (n=251, 83%), and research and medication use evaluations (n=247, 81%).

Conclusion: Health-systems pharmacists that responded to the survey indicated involvement in many different non-patient care tasks and a lack of administrative time allotted to them to complete those tasks.

Mon-9. Utilization of epoetin alfa in patients at an academic medical center

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Introduction: Epoetin alfa is utilized to correct anemia in patient populations such as chronic kidney disease and patients with cancer undergoing chemotherapy. However, severe risks of this therapy exist including death, myocardial infarction, stroke, or venous thromboembolism. It is unknown if utilization of epoetin alfa therapy is optimal at our institution. Therefore, we aimed to evaluate the inpatient efficacy, safety, and cost of epoetin alfa at our academic medical center.

Research Question or Hypothesis: The goal of this medication use evaluation is to assess the usage and appropriateness of epoetin alfa at our institution.

Study Design: Single center, retrospective chart review and medication use evaluation

Methods: Patients greater than three months old admitted to our institution between January 1st, 2021 and December 31, 2022 who received at least one dose of epoetin alfa were included. For each patient, weight, renal function, iron studies, occurrence of adverse events, and adjunct therapies (e.g. renal replacement therapy and administration of iron or vitamins) were assessed. The dose, route of administration, hemoglobin, and blood pressure were assessed to determine appropriateness for each epoetin alfa order.

Results: Of the 207 patients screened, 161 patients (77.8%) were included in the medication use evaluation. A total of 602 epoetin alfa doses were administered. Across the 161 patients, 69 (42.9%) had appropriate orders. There were 72 patients (44.7%) who had supratherapeutic dosing based on indication, three with inappropriate route of administration, and four given epoetin alfa with hemoglobins above target levels. 64 patients (39.8%) experienced adverse events during hospitalization including stroke, myocardial infarction, hypertension, or death. Estimated cost savings based on these inappropriate doses would be $24,301.92 over a two year period.

Conclusion: Current utilization of epoetin alfa at our institution warrants the consideration for protocol driven prescribing in order to mitigate costs associated with suboptimal therapy.

Tues-4. Evaluation of polyethylene glycol for the treatment of acute hepatic encephalopathy

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Introduction: Lactulose, with or without rifaximin, is typically recommended as treatment of choice for overt hepatic encephalopathy (HE) and secondary prevention. Emerging evidence evaluating polyethylene glycol (PEG) compared to lactulose for the treatment of acute HE denotes superior outcomes with PEG. However, the dosing, efficacy, safety, and tolerability of PEG in combination with lactulose for treatment and secondary prevention of HE is limited in the literature.

Research Question or Hypothesis: How does PEG used at doses commonly seen in practice affect the length of stay for patients with acute HE?

Study Design: Single center, retrospective.

Methods: Adult patients hospitalized with HE between August 1, 2018 and August 1, 2022 who received PEG, lactulose, and/or rifaximin were included. Two cohorts were analyzed: patients who received PEG vs. those who did not receive PEG for HE treatment. The primary outcome was length of hospitalization between groups. Secondary outcomes included HE recurrence, amount of study medications administered, and safety measures. The appropriate statistical tests were used for the type of data analyzed. A sensitivity analysis based on study medication administration was also conducted.

Results: A total of 440 patients were included, with 56 patients in the PEG group and 386 in the non-PEG group. PEG was associated with a longer median length of stay (16 vs. 6 days, $p<0.0001$), but this difference did not remain after sensitivity analysis (7 vs. 6 days, $p=0.131$). The PEG group received significantly less lactulose and rifaximin compared to the non-PEG group. Incidence of recurrence of HE and rehospitalization for any cause were not different between the two groups.

Conclusion: PEG was associated with a longer length of stay, but this was no longer seen after sensitivity analysis. Though PEG appears to be a safe option for this patient population, more prospective studies are needed to determine its efficacy and possible place in therapy.

Mon-7. Clinical interventions by hospital pharmacists in an integrated unit-based model

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Introduction: Integrated unit-based pharmacists are important members of the interdisciplinary patient care team with advanced knowledge of patients on their unit. They play a key role in providing medication-related clinical interventions to optimize pharmacotherapy and prevent errors.

Research Question or Hypothesis: How does having an integrated unit-based hospital pharmacist impact a patient's pharmacotherapy-related care during a hospital admission?

Study Design: Retrospective, observational analysis of the type and frequency of clinical interventions made by six integrated medical-surgical unit-based hospital pharmacists covering 153 beds from August 15 to September 16, 2022.

Methods: Pharmacists documented clinical interventions in the electronic medical record during routine practice. Clinical intervention subtype and potential severity for harm for prescribing errors were assigned during documentation using standardized definitions and severity ranking. Two pharmacist investigators independently reviewed interventions for accurate subtype and severity. Clinical interventions, further categorized as medication therapy recommendations or prescribing errors identified, are described.

Results: A total of 638 clinical interventions were documented during 850 pharmacist hours worked; 307 medication therapy recommendations and 331 prescribing errors identified. Sixty-two percent of medication therapy recommendations were a result of pharmacist-initiated consultation with a clinician, 26% clinician-initiated consultation with a pharmacist, and 12% with ancillary staff (e.g., nurse) regarding medication access, use, and compliance. A total of 331 of 2755 medication orders (12%) entered during pharmacist hours were identified to have a prescribing error. Wrong route (19%), wrong duration (13%) and therapy omissions (11%) were the most common prescribing errors identified. Prescribing orders were classified as severe (84%) or low (16%) severity and there were no life-threatening errors documented.

Conclusion: Unit-based pharmacists are able to make clinical interventions related to medication therapy recommendations or interception of prescribing errors by having a more complete understanding of integral patient specific factors due to their integration on the unit and with the patient-care team.

Tues-7. Evaluation of Unfractionated Heparin Therapy for Venous Thromboembolism Using Adjusted Body Weight in Elderly and Higher Weight Patients

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Introduction: The use of weight-based unfractionated heparin (UFH) infusions is the standard of care in hospital management of venous thromboembolism (VTE). The initial dosing strategies in older adults and higher weight patients remain uncertain given differences in pharmacokinetics and concerns for over-anticoagulation.

Research Question or Hypothesis: Does the use of adjusted body weight (AdjBW)-based dosing of UFH improve time to therapeutic anti-Xa level in older adults and higher weight patients compared to total body weight (TBW)?

Study Design: We conducted a single-center, retrospective study involving older adults aged 65 years or older and patients weighing 100 kg or greater with suspected or confirmed VTE.

Methods: Patients received a weight based UFH infusion starting at 18 units/kg/hr with or without an 80 unit/kg bolus using either TBW or AdjBW for at least 24 hours, titrated every 6 hours to a target anti-Xa level of 0.3 to 0.7 units/mL. The primary endpoint was median time to first therapeutic anti-Xa level following initiation of UFH infusion in patients receiving AdjBW-based dosing versus those receiving TBW-based dosing. Statistical analysis for the primary endpoint was performed using the Mann Whitney U test in R (version 4.3.3).

Results: The median time to therapeutic anti-Xa levels was shorter in the AdjBW group compared to the TBW group (13.6 hours versus 21.0 hours; difference 5.32 hours (95% CI 0.23 to 9.92)). This finding was driven by those aged 65 years or older, and those who received a bolus dose of UFH at the start of the infusion.

Conclusion: Among older adults and higher weight adults with suspected or confirmed VTE, the use of AdjBW to guide heparin infusion initiation was associated with improved time to therapeutic anti-Xa levels.

Ambulatory Care

Tues-10. Impact of Pharmacist-Driven Semaglutide Use to Improve Metabolic Parameters in People Without Diabetes

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Introduction: More than 1 in 3 American adults has prediabetes, and losing weight can decrease the risk of progressing to type 2 diabetes by 50%. The impact of pharmacist-driven medication-assisted weight loss for diabetes prevention is unknown.

Research Question or Hypothesis: Can pharmacist-driven use of subcutaneous semaglutide for prediabetes, impaired fasting glucose, or overweight/obesity improve weight, hemoglobin A1c (HbA1c), blood pressure (BP), and low-density lipoprotein (LDL) over a one-year period?

Study Design: Retrospective single-center pre-post study

Methods: Electronic medical records of an ambulatory care clinic were reviewed to identify people who had subcutaneous semaglutide initiated for prediabetes, impaired fasting glucose, or overweight/obesity by a pharmacist in 2021. Diabetes diagnosis and pregnancy were exclusion criteria. The primary outcome was weight change from baseline to one year after semaglutide initiation (follow-up). Secondary outcomes were changes in HbA1c, BP, and LDL from baseline to follow-up, as well as percentage of participants with HbA1c <5.7% at follow-up. Paired t-tests were used via R statistical software to assess average change from baseline to follow-up with alpha 0.05.

Results: Sixty-three participants (mean age 58.9 years, 56% female, 76% white) were included. Mean baseline weight was 236.6 pounds, HbA1c 6.0%, BP 130/81 mmHg, and LDL 114.3 mg/dL. There was a significant change from baseline for weight (-17.8 pounds, p<0.0001, n=54), HbA1c (-0.34%, p=0.0012, n=16), systolic BP (-8 mmHg, p<0.0001, n=54), and LDL (-12.7 mg/dL, p<0.015, n=50). Of the 20 participants with baseline HbA1c, 17 (85%) had HbA1c consistent with prediabetes (5.7%-6.4%). Of the 28 participants with follow-up HbA1c, 11 (39%) had HbA1c consistent with prediabetes, whereas 16 (57%) had HbA1c <5.7% and 1 (4%) had HbA1c >6.4%.

Conclusion: Pharmacist-driven use of subcutaneous semaglutide in people without diabetes led to improvements in metabolic parameters of weight, HbA1c, systolic BP, and LDL. Future studies will further elucidate the role of pharmacist-driven use of semaglutide for diabetes prevention.

Mon-29. Impact of a Pharmacist-Led Asthma Clinic in a High-Risk Pediatric Population at a Federally Qualified Health Center within a Medically Underserved Area

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Introduction: There are few reported outcomes regarding pediatric asthma treatment at federally qualified health centers (FQHC). FQHC patients are considered high-risk with complex social determinants of health. This FQHC, located in Sumter, South Carolina, has an established collaborative practice agreement for pharmacist-led management of pediatric asthma.

Research Question or Hypothesis: Direct inclusion of a pharmacist in the interprofessional team will have a positive impact on asthma control in high-risk pediatric patients.

Study Design: Single-center, retrospective, observational cohort study

Methods: Patients were included if they had a current asthma diagnosis, aged 4-21 years old, and were an active patient of the FQHC. Patients were referred to the pharmacist-led asthma clinic to receive disease state and medication device education with guideline-directed asthma pharmacotherapy changes when needed. Patients and caregivers were surveyed with age-appropriate asthma control tests (ACT) before the first asthma clinic appointment and at each follow-up visit. The primary endpoint was the change in ACT score from baseline before pharmacist intervention to most recent follow up, where a change of 2-3 points has been validated as a clinically meaningful difference. Secondary endpoints included proportions of: patients who achieved a clinically meaningful increase in ACT, usage of systemic corticosteroids or emergent care, and patients converted to utilizing the FQHC's on-site pharmacy. Continuous endpoints were evaluated using paired t-tests and categorical variables with Fisher's exact tests.

Results: Thirteen patients were enrolled with an average age of 11.8 years and 4.4 years since asthma diagnosis. Pharmacist intervention showed a statistically significant improvement in the primary endpoint (mean±SD ACT score increase 6.077±3.068; p<0.001). All patients had a clinically meaningful improvement in asthma control. One patient (7.69%) sought emergent care including systemic corticosteroid usage. Among eligible patients, 4 of 5 (80%) were converted to utilizing the on-site pharmacy.

Conclusion: Pharmacist intervention improved asthma control in high-risk pediatric patients within an FQHC.

Tues-9. Assessing provider knowledge of the 340B Drug Pricing Program in a multisite Federally Qualified Health Center

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Introduction: The federal 340B Drug Pricing Program requires manufacturers to provide outpatient drugs to healthcare organizations serving vulnerable communities at reduced prices. Despite the important role of 340B program revenue to these organizations, it is unknown if healthcare providers understand the 340B program and how it supports enhanced patient services.

Research Question or Hypothesis: What is the knowledge of and attitudes toward the 340B program amongst healthcare providers in a large, multi-site Federally Qualified Health Center (FQHC)?

Study Design: Cross-sectional survey

Methods: We developed a 27-item survey to assess prescriber knowledge and attitudes toward the 340B program, as well as respond to a patient case involving add-on therapy for a patient with uncontrolled diabetes. The survey was administered electronically to prescribers in early 2023. Closed-ended items were summarized using descriptive statistics, and open-ended items analyzed with qualitative methods.

Results: A total of 198 prescribers received the survey; of those, 65 (32.8%) participated. The majority were female (66.2%) and were most often age 35 or less (41.5%) and physicians (49.2%). The majority of respondents agreed that patients benefited from access to the organization's 340B pharmacies (95.0%). Respondents also found value in using onsite pharmacies (86.7%) and agreed that 340B pricing is important to consider when prescribing medications (78.3%). However, knowledge of the 340B program was limited, with only half (54.0%) able to correctly answer at least 4 of 7 questions. Patient case responses also indicated that some prescribers opted to begin a sulfonylurea over a sodium-glucose cotransporter-2 inhibitor due to a lack of knowledge of 340B pricing.

Conclusion: Findings suggest that prescribers believe the 340B program benefits patients and the organization, but prescribers often lacked a complete understanding of the program. These knowledge gaps may impact prescribing decisions. Future research should focus on prescriber education as a strategy to help organizations optimize their 340B programs and facilitate patient access to medications.

Mon-12. Cost-Avoidance of APPE Pharmacy Students during an Ambulatory Care Rotation in a Family Medicine Clinic

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Introduction: Pharmacy students have been shown to make valuable interventions associated with cost-avoidance during both inpatient and ambulatory care advanced pharmacy practice experiences (APPE's). Previous studies have utilized cost-avoidance models for interventions associated with both the inpatient and ambulatory care settings.

Research Question or Hypothesis: The purpose of this study is to demonstrate the value of interventions and encounters of pharmacy students using a cost-avoidance model specific to the ambulatory care setting.

Study Design: Pharmacy students each completing a 5-week ambulatory care rotation at a family medicine residency clinic were asked to report all accepted interventions and patient encounters to their faculty preceptor. Data was collected from May 2021 to April 2022, and all interventions and encounter types were documented in a Microsoft Excel® Spreadsheet. Cost-avoidance from the interventions were calculated using a model previously utilized from Am J Health Syst Pharm. 2017;74:e*76-e82*.

Methods: The primary outcome assessed the total cost-avoidance the pharmacy students saved the clinic. Secondary outcomes assessed the total and types of interventions and the encounter types where the interventions were made. Descriptive analyses were used to analyze the data.

Results: Fourteen pharmacy students completed the APPE rotation and demonstrated a total cost-avoidance of $83,288. This was calculated from a reported 1,610 interventions during 930 patient encounters. The most common intervention types were providing patient education, implementing a dose change, and answering a drug information question. The majority of encounter types, 718 of 930, were from direct patient care with 573 of the direct patient care encounters occurring during pharmacy only visits and 145 occurring during shared visits with providers.

Conclusion: Pharmacy students can play an integral role in a family medicine residency clinic by providing valuable recommendations tied to cost-avoidance through a variety of patient encounter types.

Tues-12. Characterization of Medication Complexity in a Metabolic Genetics Clinic

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Introduction: The availability of FDA approved treatments for patients diagnosed with rare genetic metabolic disorders has expanded within the last decade. The complexity of medication use in this patient population has not previously been described.

Research Question or Hypothesis: The primary objective was to characterize the complexity of medication use in patients with metabolic genetic disorders.

Study Design: Retrospective cross-sectional study

Methods: Patients with a confirmed diagnosis of a metabolic genetic disorder were included. Pregnant patients were excluded. Data was collected via manual chart review and consisted of diagnosis, medication use and laboratory data. The primary endpoint was medication complexity defined as use of specialty pharmacy, manipulation of dosage forms, and routine laboratory monitoring requirements. Costs were determined using the FDA RedBook. Descriptive statistics were utilized to characterize the data using Excel.

Results: Of 225 patients screened, 152 were included. Most patients were less than 21 years of age (n=93, 61.2%) and phenylketonuria was the most frequent diagnosis (n=63, 41.4%). 95 patients required 110 medications for treatment of their metabolic genetic disorder. 77 medications (70%) required use of a specialty pharmacy and 69 medications (62.7%) required prior authorization. Enteral administration was most common (n=80, 72.7%) and of these 64.6% (n=51/79) required manipulation prior to administration. Injectable medication dosage forms included bulk vials (n=5, 4.5%), prefilled syringes (n=10, 9.1%), and intravenous infusions (n=15, 13.6%). Laboratory testing related to medication efficacy and safety was required in 90 patients with an observed compliance of 81.1% to any lab draw. The average annual cost per medication exceeded $100,000 in 47.2% of medications prescribed (n=51/108).

Conclusion: This study demonstrated the complexity of medications utilized for treatment of metabolic genetic disorders with an observed majority of medications requiring additional steps for acquisition, administration, and monitoring. The role of the pharmacist should be explored to optimize the use of complex, high-cost therapy in this patient population.

Tues-14. The Effect of an Interprofessional Chronic Care Management Program on Diabetes-Related Clinical Outcomes in a Medically Complex Patient Population.

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Introduction: Chronic Care Management (CCM) programs allow a team-based approach to improve chronic disease state management; however, the literature on clinical outcomes from CCM interventions by a defined interprofessional team is limited. Patients with type 2 diabetes (T2D) often have coexisting chronic conditions requiring greater monitoring, interventions, and follow-up to prevent disease-related complications. This study focuses on CCM-enrolled patients diagnosed with T2D with the goal of evaluating diabetes-related outcomes of a CCM program facilitated by a physician, clinical pharmacists, a social worker and a medical assistant.

Research Question or Hypothesis: What impact does interprofessional chronic care management have on diabetes-related clinical outcomes?

Study Design: Retrospective, pre-/post- intervention chart review

Methods: A chart review of adult Medicare beneficiaries with T2D enrolled in CCM from February to August 2020 was completed with outcomes evaluated via non-parametric tests to compare clinical measures, preventative measures, and clinical staff time-on-task 12 months before and after the enrollment date.

Results: Forty-two patients met inclusion criteria. Statistically significant pre-/post measures included reductions in A1C (7.5 vs 6.8%, p-value = 0.003) and BMI (34.8 vs 34.0, p-value < 0.001), and increased clinical staff involvement for pharmacist interventions (9 vs 36, p-value < 0.001) and social worker interventions (1 vs 24, p-value < 0.001). Clinically significant measures included reductions in blood pressure, achieving A1C < 8%, and attainment of multiple preventative measures. A majority (87.4%) of CCM services offered were facilitated by clinical staff members.

Conclusion: The interprofessional CCM program for patients with T2D proves to have clinical benefits in a medically complex patient population. Although limitations emerged from the study period overlapping with the COVID-19 pandemic, this study highlights ample opportunity to further analyze the impact CCM programs may have on the overall health of patients with chronic conditions. Further studies in non-pandemic conditions would likely be useful.

Sun-12. Evaluation of Routine Vaccine Acceptance Among Patients at a Free Clinic Utilizing the Health Belief Model

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Introduction: Vaccine-preventable diseases continue to cause morbidity and mortality. The WHO named vaccine hesitancy as a top 10 threat to global health in 2019. Vaccination rates for uninsured adults, especially immigrants, are lower for routine vaccinations than

for their insured counterparts. The Birmingham Free Clinic (BFC) provides health services to uninsured individuals in Pittsburgh, with immigrants being the largest patient population.

Research Question or Hypothesis: "What factors influence vaccine acceptance or refusal among uninsured patients?"

Study Design: Single-center cross-sectional study using semi-structured questions to assess factors leading to vaccine acceptance or refusal.

Methods: Between January and March of 2023, patients at BFC were screened for vaccine eligibility using the CDC adult vaccination schedule. Patients missing at least one of the vaccinations (influenza, pneumococcal, hepatitis B, herpes zoster, and tetanus/diphtheria) or not fully vaccinated for COVID-19 were recruited. The interviewers used the Health Belief Model framework to assess factors related to vaccine acceptance or non-acceptance. Data was analyzed using descriptive statistics.

Results: 198 patient charts were reviewed, 44 were screened, and 32 (73%) (including 81% being immigrants) were eligible to participate. Acceptance rates for vaccinations were: 36% (4/11) for influenza, 50% (8/16) for COVID-19, 67% (2/3) for Tdap, 67% (12/18) for PCV20, 73% for zoster (11/15), and 74% (17/23) for Hepatitis B. The most common constructs influencing vaccine acceptance were: perceived susceptibility (influenza), perceived severity (PCV20), perceived benefits (hepatitis B), and cue to action (Tdap). The most common constructs influencing vaccine nonacceptance were: perceived susceptibility (Tdap), and perceived barriers, especially adverse events (COVID-19).

Conclusion: Influenza and COVID-19 had the lowest acceptance rates, driven by perceived susceptibility, perceived barriers, and cue-to-action. Perceived susceptibility and benefits were most consistently associated with vaccine acceptance. Perceived susceptibility, barriers, and cue to action were most consistently associated with overall vaccine hesitancy. A targeted and personalized focus on disease susceptibility and vaccine benefits may increase vaccine acceptance.

Tues-11. Impact of Pharmacy Involvement on Care Gap Closure in Managed Medicaid Patients

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Introduction: The Pharmacy Population Health Center (PPHC) was developed to improve overall health and increase reimbursement for patients with value-based care (VBC) plans. Their ability to increase Medicaid gap closure using the Pharmacy Risk Score (PRS) is unknown.

Research Question or Hypothesis: Does pharmacy involvement increase Medicaid care gap closure?

Study Design: A single-center, retrospective, cohort study of Managed Medicaid-insured patients seen at outpatient facilities within a large academic medical center.

Methods: Adult patients with a PRS of six or greater and were failing both hemoglobin A1c (HbA1c) and blood pressure (BP) care gaps. The intervention included patients who were reviewed by pharmacy, compared to the control of patients who were not. The primary outcome was closure of at least one care gap by the end of 2022. Secondary outcomes included number of each gap closed, frequency of pharmacist recommendations, and frequency of recommendations implemented by providers.

Results: Data was collected for 80 patients from January 2022 – October 2022. The primary outcome occurred in 37 (74%) patients in the intervention and 15 (50%) patients in the control (OR 2.85, p-value 0.032). HbA1c gap was closed in 30 (60%) patients in the intervention and 8 (27%) patients in the control. BP gap was closed in 24 (48%) patients in the intervention and 11 (37%) patients in the control. The number of recommendations made was associated with gap closure (p-value 0.012) while the number of recommendations implemented by providers was not (p-value 0.4).

Conclusion: Pharmacy intervention was associated with a nearly three-times increase in closure of at least one care gap in Medicaid patients, with HbA1c gap closure achieved more frequently than BP gap closure. The number of recommendations made by pharmacy was associated with increased gap closure regardless of the number implemented by providers. The PRS accurately identified patients who would benefit from pharmacy involvement.

Tues-13. Pharmacists' Role in Multidisciplinary Mobile Integrated Health Community Paramedicine (MIH-CP) Transitional Care Model: Retrospective Analysis of Medication-Related Problems to Improve Health Outcomes

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Introduction: Medication related problems (MRPs) are common after hospitalization. Coupled with inadequate follow-up post-discharge, it can lead to downstream rehospitalizations and higher healthcare costs. Transitions of care (ToC) introduce a variety of patient challenges, ranging from new medications and changes to existing regimen. The MIH-CP program affiliated with the University of Maryland Medical Center (UMMC) focuses on improving patient transitions by addressing both medical and social determinants of health.

Research Question or Hypothesis: To quantify and evaluate MIH-CP pharmacist identified MRPs during ToC visits during July 1, 2021-July 31, 2022.

Study Design: A retrospective observational study. Adult patients discharged from UMMC or UMMC Midtown campus, and residing in West Baltimore zip codes were enrolled in MIH-CP program.

Methods: A descriptive analysis of the MRP, the types and the severity and the potential medication-related harm. For each MRP, the pharmacist documented the category, medication name, actions taken to resolve, and the outcome of the intervention in a Microsoft Excel database. A thorough evaluation of the pharmacists' documentation was conducted and utilized as the main data source for this study.

Results: 334 ToC visits were conducted during the 1-year study period. 80.4% of patients had at least one MRP. A total of 545 MRPs were identified and intervened on by the pharmacist during the study period. Of the 545 MRPs, 458 were classified by severity- 39% mild, 23.5% moderate, and 20.5% severe. Nearly half (46%) of the total MRPs were classified as missing medications. The severity status was determined by the potential of the MRP to lead to a hospital readmission. In the severe category, 53.6% were correlated with cardiovascular medications, 19.5% were respiratory agents and 14.3% were antidiabetic agents.

Conclusion: Pharmacists play an integral role in preventing MRPs, especially where high-risk patients and health literacy concerns are a conflict.

Sun-10. Access barriers to the Sodium-glucose co-transporter 2 inhibitors in patients with diabetes at a county-based primary care clinic

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Introduction: Diabetes is a debilitating disease leading to potential micro-and macrovascular complications when left untreated. Data shows sodium-glucose cotransporter 2 (SGLT-2) inhibitors are effective in preventing these complications; however, literature has shown significant access barriers.

Research Question or Hypothesis: Examine potential barriers of SGLT-2 inhibitor access in marginalized populations.

Study Design: retrospective, observational, single center study

Methods: 18 years and older with T2DM seen at the primary care clinic between January to December of 2022 were included. Electronic medical records were utilized, and patients were screened according to the 2022 ADA guidelines and divided into two groups: people who were initiated and not initiated on SGLT-2 inhibitor. Primary outcome, compare average A1c baseline values and comorbid conditions between the groups. Subgroup analysis on the initiated group to examine time difference between prescription and fill date. Chi-square or Fisher's exact, were performed for categorical variables, and T-Test or Wilcoxon-Mann Whitney test (non-parametric) were applied to continuous variables to determine group difference.

Results: 513 patients were screened, and 123 were eligible. 42 patients were initiated with SGLT-2 inhibitor and 81 were not. Average age was 60 with half being males in each group. Majority of patients in each group self-identified as Hispanic with MediCaid as their primary insurance. Average A1c at baseline was 8.8% in initiated group and 8.3% in non-initiated, not statistically significant ($p=0.33$). Significant difference seen in certain comorbid conditions. Higher portion of patients had heart failure in initiated group compared to non-initiated (48% vs. 9%, $p<0.0001$). Sub analysis for initiated group, 88% of prescriptions were sent to county pharmacies. Days lapsed between prescription and fill date was 63.3 at county compared to 78.7 at non-county pharmacies.

Conclusion: Despite eligibility per the 2022 ADA guidelines, larger number of patients were still not being initiated with a SGLT-2 inhibitor, and barriers still exist to access SGLT-2 inhibitors in marginalized population.

Mon-30. Real World Observations of using Compounded GLP-1 Agonists within a Clinical Pharmacist-Managed Cardiometabolic Clinic

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Introduction: Larger waist circumference, higher blood pressure, inflammation, and insulin resistance contribute to cardiometabolic risk. There is great interest in semaglutide/tirzepatide due to effect on weight loss, yet insurance restrictions limit use. The benefit of these agents in patients without overt T2DM is unknown. Compounded product has become available given the national shortage of GLP-1 agents. We present data from a pharmacist-managed cardiometabolic clinic using compounded GLP-1s in patients with cardiometabolic risk whose insurance coverage for commercially available product was denied.

Research Question or Hypothesis: Do compounded GLP-1 agonists improve cardiometabolic risk in patients without T2DM?

Study Design: Retrospective review

Methods: Patients with cardiometabolic risk factors whose insurance denied coverage for commercially available GLP-1 agents met criteria for inclusion. Patients met with pharmacists weekly to discuss diet and exercise, adverse events, and dose titration of compounded GLP-1. Retrospective review was performed for those who completed 12 weeks of the program; outcomes were compared from baseline. Outcomes included change in metabolic risk factors. Paired-student's t-test and Chi-squared statistics were utilized.

Results: Change in Cardiometabolic Risk

N=50	Avg Baseline	Avg 12-week	P value
Weight (pounds)	226.9+/-38.9	210.8+/-36.5	P<0.0001
BMI (kg/m^2)	34.6+/-4.2	32.2+/-3.9	P<0.0001
Waist Circumference (inches)	45.8+/-4.9	42.9+/-4.1	P<0.0001
Systolic Blood Pressure (mm Hg)	140.9+/-17.9	127.0+/-15.0	P=0.0001
Diastolic Blood Pressure (mm Hg)	83.6+/-13.6	78.3+/-10.1	P=0.017
A1C	5.5+/-0.3	5.3+/-0.3	P<0.0001
hs-CRP	4.9+/-3.6	3.7+/-3.32	P=0.0004
Vitamin D	37.7+/-21.3	47.8+/-23.0	P<0.0001

Fifty patients (18 males; 32 females) completed the 12-week-followup. Average weight loss was 16.06 +/-7.6 pounds (7% from baseline, p=0.001). Diagnostic criteria for hypertension, prediabetes, BMI>30, and metabolic syndrome were reversed in 24, 15, 15, and 18 patients respectively. Average dose of compounded semaglutide and tirzepatide titrated by 12 weeks was 1.02+/-0.4 and 8.125+/-1.25 mg, respectively.

Conclusion: A 12-week cardiometabolic program implemented by pharmacists with compounded GLP-1s improved all markers of cardiometabolic risk.

Sun-13. Assessment of ASCVD Risk and Statin Utilization in Patients at Community Pharmacies

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Introduction: Statins are highly effective in reducing risk of atherosclerotic cardiovascular disease (ASCVD) but are often under-prescribed for primary prevention. Recent community pharmacy-based studies demonstrate increased statin prescribing for primary prevention in patients with diabetes. However, no study has investigated the impact of community-based pharmacists conducting ASCVD risk assessments to determine statin eligibility.

Research Question or Hypothesis: Can ASCVD risk assessment conducted within the community pharmacy setting identify individuals who qualify for statin therapy for primary ASCVD prevention?

Study Design: This study is a prospective cohort study conducted at community pharmacies in New Mexico. Participants were identified through screening of community pharmacy records.

Methods: Participants eligible for inclusion were between 40-79 years old with diabetes or 50-79 years old with hypertension and/or current tobacco smoker. Individuals were excluded if they were currently prescribed a statin. Eligible participants were consented and scheduled at their community pharmacy for an ASCVD risk assessment where they were counseled by the pharmacist about their risk assessment and possible statin eligibility. Participants were then given an anonymous survey surrounding their perceptions of the service and interest in pharmacist-prescribed statins. The primary endpoint was the number of statin eligible participants.

Results: 57 participants completed the ASCVD risk assessment. Of those, 45 (78%), were possible statin candidates. 17 participants (29%) qualified for statin therapy based on the presence of diabetes. 53 participants (92%) agreed or strongly agreed that the ASCVD risk screening performed by the pharmacist was helpful and informative. 44 participants (77%) indicated that if the ASCVD screening demonstrated statin eligibility, they trusted the pharmacist to prescribe a statin.

Conclusion: The majority of participants were eligible for statin therapy. Most participants indicated trust in the pharmacist to prescribe statins. This study supports the need for community pharmacist involvement in statin prescribing to help close a gap in care.

Cardiovascular

Sun-19. Clinical versus fixed warfarin dosing at initiation and the impact on the anticoagulation quality

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Introduction: Different dosing strategies exist to initiate warfarin, most commonly fixed warfarin dosing (FWD), clinical warfarin dosing

(CWD) and genetic- guided warfarin dosing (GWD). Landmark trials have shown GWD to be superior when compared to FWD (EU-PACT trial) or CWD (GIFT trial). COAG trial did not show differences between GWD and CWD. This controversy raised the question on whether one of these control arms (CWD and FWD) is superior than the other. However, to date, no clinical trials exist to compare the outcomes of CWD to FWD.

Research Question or Hypothesis: To compare between the efficacy and safety of CWD and FWD.

Study Design: Prospective cohort with a retrospective comparator.

Methods: Recruited subjects in the prospective arm were started on warfarin according to the clinical dosing component of the algorithm published in www.warfarindosing.org for 3-5 days. The primary efficacy outcome was the percentage time in therapeutic INR range (PTTR) from day 4-30.

Results: The study enrolled 122 and 123 patients in the CWD and FWD, respectively. The PTTR did not differ statistically between CWD and FWD (62.2 ±26.2% Vs. 58± 25.4%, p=0.2). There was also no difference between both arms in the percentage of visits with extreme subtherapeutic INR (<1.5) [15 ± 18.3% Vs. 16.8 ± 19.1%, p=0.44] or extreme supratherapeutic INR (>4) [7.7 ±14.7 % Vs. 7.5 ±12.4 %, p=0.92]. Thromboembolic and major bleeding events did not differ between both arms (24.92 Vs. 16.42 cases/1000 person months p=0.64 and 33.05 Vs. 16.01 cases/1000 person months p=0.4, respectively).

Conclusion: CWD did not improve the anticoagulation quality parameters compared to the FWD which could infer that the results of the COAG trial maybe primarily due to the heterogenous population included, further supporting the use of GWD as a strategy superior to both CWD and FWD.

Sat-10. Identifying predictors of the achievement of iron deficiency treatment goals in patients with heart failure or pulmonary hypertension

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Introduction: Intravenous iron therapy is recommended in patients with heart failure (HF) with reduced ejection fraction. However, little evidence evaluated predictors to achieve iron deficiency treatment goals with intravenous iron therapy.

Research Question or Hypothesis: What are significant predictors for the achievement of iron deficiency treatment goals using intravenous iron therapy?

Study Design: Single center retrospective cohort study

Methods: The study inclusion criteria were patients older than 18 years of age diagnosed with HF or pulmonary hypertension who met the criteria for iron deficiency. Primary outcome was an iron deficiency treatment goal defined as hemoglobin ≥ 15 mg/dL or iron studies (either ferritin ≥ 300 ng/mL or ferritin 100-299 ng/mL and iron saturation ≥ 20 %). Age, weight, body mass index, gender, ejection fraction, baseline ferritin, baseline iron saturation, absolute iron deficiency (versus. functional iron deficiency), baseline hemoglobin, SGLT-2 inhibitor use, total intravenous iron amount during induction course, and intravenous iron indication were evaluated as predictors. Univariate logistic regression analyses were conducted to investigate the association between the predictors and the primary outcome. All statistical analyses were performed using R 4.3.0 (R Core Team, Vienna Austria).

Results: A total of 123 patients were included. Baseline iron saturation (odds ratio (OR) 2.15; 95% confidence interval (CI): 1.04, 4.47; p = 0.040) and HF with reduced ejection as an indication for intravenous iron therapy (OR 3.03; 95% CI: 1.29, 7.13; p = 0.011) were significant predictors for the achievement of iron deficiency treatment goals. There were also significant non-linear relationships between baseline hemoglobin (OR 1.49; 95% CI 0.82, 2.69; p=0.039) and body mass index (OR 0.53; 95% CI 0.26, 1.10; p=0.014) and achievement of iron deficiency treatment goals.

Conclusion: Higher baseline iron saturation, higher baseline hemoglobin, lower body mass index, HF with reduced ejection fraction as an indication for intravenous iron therapy were the significant predictors of achieving iron deficiency treatment goals.

Tues-20. Tolerability of Rapid Initiation Versus Traditional Sequencing of Guideline Directed Medical Therapy in Newly Diagnosed Patients with Heart Failure with Reduced Ejection Fraction

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Introduction: Rapid initiation and titration of heart failure with reduced ejection fraction (HFrEF) guideline directed medical therapy (GDMT) may increase the risk of adverse events. The best approach for initiation and tolerability of the 4 pillars of GDMT in newly diagnosed HFrEF remains unclear.

Research Question or Hypothesis: Newly diagnosed patients with HFrEF simultaneously initiated on all 4 pillars of GDMT prior to hospital discharge have higher rates of intolerance than less aggressive initiation strategies.

Study Design: Single center, retrospective study.

Methods: The study included adult patients admitted between May 2021 and September 2022 with newly diagnosed HFrEF initiated on GDMT. The primary outcome compared a composite safety outcome composed of hypotension, bradycardia, dizziness, fatigue, acute kidney injury, and elevated potassium between patients initiated on all 4 GDMT medications during the index hospitalization versus patients initiated on 3 medications or less at 1 and 3 months. Secondary outcomes included the percentage of patients on all 4 GDMT

medications at 3 months and the number of hospitalizations due to heart failure exacerbations compared between the groups.

Results: Of the 34 patients included, 18 (52.9%) received a 4 drug regimen and 16 (47.1%) received 3 or less GDMT medications prior to hospital discharge. There was no significant difference in the composite safety outcome at 1 month between groups (31.6% vs 26.7%, p = 1). Of 23 patients with available data at 3 months, patients on 3 or less medications at initial hospital discharge were less likely to be on all 4 pillars by 3 months (63.6% vs 0%, p= 0.001). The percentage of hospitalizations due to heart failure exacerbations at 3 months were similar between groups.

Conclusion: In patients with newly diagnosed HFrEF, initiation of all 4 pillars of GDMT by the time of hospital discharge have similar rates of safety events compared to patients initiated on 3 or less medications.

Mon-35. Bleeding Outcomes in Patients Receiving Aspirin During Veno-Arterial Extracorporeal Membrane Oxygenation

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Introduction: The incidence of bleeding complications during veno-arterial extracorporeal membrane oxygenation (V-A ECMO) remains high. Therapeutic anticoagulation is required to maintain circuit integrity; however, many patients also have indications for aspirin. The purpose of this study is to evaluate bleeding outcomes of patients receiving concomitant anticoagulation and aspirin while supported with V-A ECMO.

Research Question or Hypothesis: We hypothesized that initiation of aspirin during V-A ECMO would not result in excess major bleeding complications.

Study Design: This single-center, retrospective, cohort study evaluated adult patients receiving aspirin while on V-A ECMO between 1/1/2016 and 08/02/2021.

Methods: The primary outcome of this study was major bleeding (bleeding that required surgical intervention, decrease in hemoglobin ≥2 g/dL, or requiring transfusion of ≥2 units of packed red blood cells concurrently). Aspirin and no aspirin groups were propensity score matched using 1:1 nearest neighbor matching without replacement. Groups were matched on age, etiology of shock, coronary artery disease, prior cerebrovascular accident, prior gastrointestinal bleed, prior intracranial hemorrhage, baseline hemoglobin and platelet count, peripheral cannulation, post-cardiotomy status, SAVE score, and aspirin or P2Y12 inhibitor use prior to ECMO.

Results: A total of 293 patients met criteria for study inclusion. Of those, 102 (34.8%) received aspirin while on V-A ECMO. After propensity score matching, 69 patients in each group were used for the final analysis; covariates were well-balanced. The majority of patients on aspirin received 81 mg of aspirin (72.5%) and median duration of therapy was 3.9 (1-6.1) days. There was no significant difference in major bleeding between the groups (29% aspirin vs. 39.1% no aspirin; p=0.28). Median ECMO duration was 6 days.

Conclusion: The initiation of aspirin while on V-A ECMO did not result in excess major bleeding compared to patients on anticoagulation alone. These findings suggest aspirin can be safely initiated and continued for short durations in patients requiring V-A ECMO support.

Sat-13. Evaluating Eligibility Criteria Of The Strong-hf Trial For Patients In Real-world Setting, An Experience From An Advanced Heart Failure Program In A Tertiary Care Health System

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Introduction: The STRONG-HF trial shows that rapid up-titration of guideline-directed medication therapy (GDMT) and close monitoring can lower all-cause death or AHF readmissions within 180 days compared to standard care. However, concerns exist about the trial's selection criteria limiting its applicability, potentially making this intensive treatment strategy suitable for only a smaller group of patients.

Research Question or Hypothesis: We hypothesize that a substantial number of patients admitted with AHF at our medical center are not eligible for the inclusion criteria of the STRONG-HF trial.

Study Design: Single-center, retrospective chart review.

Methods: We reviewed the medical records of patients with AHF from January 1 to January 31, 2022, and assessed their eligibility for the STRONG-HF trial. Hospitalizations due to AHF were identified using diagnosis-related group codes 291, 292, and 293.

Results: In January 2022, a total of 94 patients with AHF were hospitalized. Among them, nine were not followed at our center and thus excluded. Of the remaining 85 patients, only six (7.1%) met the inclusion criteria for rapid up-titration of GDMT, but one died within three months of discharge. On day 80-100, out of five patients, only one took sacubitril/valsartan, and two took dapagliflozin. Of the remaining 79 patients (92.9%), the top reasons for not meeting the criteria were eGFR <30 mL/min/1·73m^2 or dialysis within 3 months after admission, NT-proBNP <2500 pg/mL at admission, age <18 or >85 years, and had active infection at any time during the AHF hospitalization.

Conclusion: The study indicates that a significant number of AHF patients at our medical center do not meet the STRONG-HF trial's criteria for rapid GDMT up-titration. It's uncertain whether the benefits of this intensive strategy can be applied in real-world situations. More research is necessary to assess the practicality and efficacy of implementing rapid up-titration in a wider patient population.

Sun-32. Impact of the Addition of Pharmacy Services to the Cardiac Catheterization Laboratory

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Introduction: The cardiac catheterization laboratory (CCL) is a unique site for pharmacy services. In November of 2020, the cardiology team at Nebraska Medicine expanded pharmacy services with the addition of a pharmacist to the CCL.
Research Question or Hypothesis: What is the benefit of pharmacist presence in the CCL?
Study Design: The primary outcome of this retrospective chart review included patients who underwent percutaneous coronary intervention (PCI) and discharged from observation status between July 1, 2018 and June 30, 2019 (pre-period) or discharged from the CCL between July 1, 2021 and June 30, 2022 (post-period). Secondary outcomes were measured in all patients who discharged directly from the CCL in the post-period.
Methods: The primary outcome of this study was to compare the percentage of patients discharged from the CCL on each component of appropriate guideline-directed medical therapy after PCI before and after pharmacy presence in the CCL. The primary outcome was measured using a Chi-square test with an alpha of 0.05. Multiple secondary outcomes were also assessed.
Results: Compared to the pre-period, in the post-period, significantly more patients were discharged on high intensity statin therapy (47.9 vs. 78.0%, P<0.0001) and fewer patients were discharged on the contraindicated combination of omeprazole or esomeprazole with clopidogrel (18.7 vs. 3.9%, P<0.0001). Secondary outcomes showed that 23.9% of PCI discharges had a clinically significant pharmacist intervention, of which high intensity statin and clopidogrel drug interaction avoidance were the most common, 96.5% of PCI patients received "Protect Your Stent" education, 13.6% of all discharges had any pharmacist intervention, 771 prescriptions were sent to our outpatient pharmacy, and 66.4% of patients had a medication reconciliation completed.
Conclusion: Pharmacist interventions were associated with higher rates of high intensity statin and lower rates of clopidogrel with omeprazole or esomeprazole following PCI. These data highlight the importance of pharmacy presence on the cardiac care team.

Sat-12. Development and Validation of the Pharmacological Statin-Associated Muscle Symptoms Risk Stratification (PSAMS-RS) Score

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Introduction: Statin-associated muscle symptoms (SAMS) contribute to statin nonadherence. In a previous study, we have successfully developed and validated a pharmacological SAMS (PSAMS) phenotyping algorithm that distinguishes objective vs nocebo SAMS using structured and unstructured Minnesota Fairview electronic health records (EHRs) data.
Research Question or Hypothesis: We aimed to develop and validate a pharmacological SAMS risk stratification (PSAMS-RS) score using Fairview EHR data.
Study Design: Retrospective cohort study
Methods: Using our PSAMS phenotyping algorithm, we identified PSAMS cases and controls based on Fairview EHR data. We split the data into derivation (1/1/2010 to 12/31/2018) and validation (1/1/2019 to 12/31/2020) cohorts. The derivation cohort was further split into 80% training and 20% testing cohorts. EHR features were screened using Least Absolute Shrinkage and Selection Operator (LASSO). A PSAMS-RS score was constructed based on LASSO coefficients in the training set, with a score cutoff determined by optimizing precision/recall balance in the testing set.
Results: We identified 1.9% (310/16128) PSAMS patients in the derivation and 1.5% (64/4182) in the validation cohort. After fitting the LASSO regression, 4 out of 59 clinical features were determined to be significant predictors for PSAMS risk. A score >26 points is associated with significantly higher hazard of developing SAMS within a year of statin initiation in the derivation (HR, 2.01; 95% CI, 1.62-2.61) and in the validation cohort (HR, 2.03; 95% CI, 1.13-3.74). PSAMS-RS Score= 8 - 8x male gender + 2x concurrent beta-blockers use + 23x prior coronary artery disease + 3x prior peripheral vascular disease
Conclusion: The PSAMS-RS score provides a simple tool to stratify patients' risk of developing PSAMS after statin initiation. For patients with a score >26, clinicians could take preemptive measures to prevent potential PSAMS-related statin nonadherence.

Tues-16. Chlorothiazide versus metolazone for augmented diuresis in acute heart failure and renal dysfunction: A multi-center retrospective study

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Introduction: Guidelines recommend IV loop diuretics for patients hospitalized with acute heart failure (AHF) and volume overload; additional agents can be added as needed. However, limited data guide which augmenting agent to add.

Research Question or Hypothesis: Do chlorothiazide (CTZ) and metolazone (MTZ) differ in efficacy or safety when used in combination with loop diuretics for diuresis in diuretic-resistant patients with AHF and impaired renal function?

Study Design: Multi-center, retrospective study analyzing 6 months of data from patients with hospitalized AHF who received MTZ or CTZ in addition to IV loop diuretics.

Methods: Adult patients with an estimated glomerular filtration (eGFR) <45 mL/min/m2 who received at least 80mg IV furosemide equivalents for at least 24 hours prior to thiazide administration were included. Patients who were prisoners, pregnant, CrCl <10 mL/min, or on multiple thiazide diuretics within the study period were excluded. The primary endpoint was a comparison of 24-hour urine output (UOP) between the 24 hours before and after thiazide administration. Secondary and safety endpoints included weight change, requirement for vasopressors or inotropes during the study period, electrolyte abnormalities, and changes in eGFR.

Results: A total of 223 patients were included. Baseline demographics were similar between groups except for age (higher in MTZ) and home loop diuretic dose (higher in CTZ). Mean 24-hour UOP increased more among CTZ patients (1668 to 3826 mL) versus MTZ (1672 to 2834 mL) (p<0.001). No differences in weight, eGFR, or SCr were observed. CTZ patients were more likely to require norepinephrine, vasopressin, or dobutamine (p<0.05) but not other vasopressors or inotropes. More hypomagnesemia was observed in the MTZ group; no differences in other electrolytes were observed.

Conclusion: CTZ was associated with a greater increase in 24-hour UOP than MTZ. CTZ-treated patients were more likely to require vasopressors/inotropes but less likely to experience electrolyte abnormalities.

Sun-20. Safety of Beta-Blocker Administration in STEMI Patients with Risk Factors for Cardiogenic Shock

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Introduction: Beta-blockers are required after ST-segment elevation myocardial infarction (STEMI). However, in patients at risk of cardiogenic shock, guidelines recommend against their use in the first 24 hours.

Research Question or Hypothesis: Is early beta-blocker use associated with cardiogenic shock after STEMI in patients with risk factors for shock?

Study Design: Retrospective chart review

Methods: Cardiogenic shock was assessed in adult patients with STEMI and percutaneous coronary intervention (PCI) with risk factors for shock (age above 70 years, systolic blood pressure below 120 mmHg, and heart rate above 120 bpm or below 60 bpm) who did or did not receive a beta-blocker 24 hours after PCI. Exclusion criteria were: presence of atrial fibrillation, pacemaker or implanted defibrillator; or beta-blocker intolerance. Data extraction occurred via manual chart review. Descriptive statistics were completed and T-tests, Chi-Squared, and Fisher's Exact were used as appropriate. The risk of developing cardiogenic shock was assessed using multivariable logistic regression with evaluation of covariates with a p-value < 0.2. Alpha was set at < 0.05 and analyses were completed using SAS version 9.4 (SAS Institute INC., Cary, NC, USA).

Results: A total of 216 patients were included, 131 without an early beta-blocker and 85 with. Non beta-blocker versus beta-blocker patients had a mean (standard deviation) age of 64.29 (14.45) years versus 62.44 (13.55), p=0.3435; and peak troponin of 123.04 (209.77) ng/dL versus 101.37 (153.85), p=0.4473. Cardiogenic shock occurred in 12.21% (n=16) without early beta-blocker use versus 4.71% (n=4) with, p=0.0629. After backwards stepwise logistic regression, early beta-blocker use was not associated with cardiogenic shock (adjusted odd ratio [aOR] 0.350, 95% confidence interval (CI) 0.111-1.100; p=0.0724), but those with higher peak troponin had an over 3-fold increased risk of developing cardiogenic shock (aOR 3.376, 95% CI 1.311-8.694; p=0.0117).

Conclusion: Early beta-blocker administration in STEMI patients may not be associated with shock development.

Sun-16. Evidence-based prescribing for heart failure and reduced ejection fraction: A qualitative evaluation of modern-day solutions to prescribing challenges

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Introduction: More than 90% of patients with heart failure and reduced ejection fraction (HFrEF) are not prescribed recommended medications. Current challenges to optimal prescribing include: (a) misconceptions, unfamiliarity, or discomfort in applying guidelines/evidence, (b) clinical inertia, (c) multilevel competing priorities, and (d) insufficient availability and timeliness of reliable patient data and monitoring.

Research Question or Hypothesis: To identify possible solutions to strategically address current challenges to prescribing evidence based HFrEF medications (i.e., beta blockers, angiotensin converting enzyme inhibitors/angiotensin receptor blockers/angiotensin receptor neprilysin inhibitors, sodium/glucose cotransport 2 inhibitors, mineralocorticoid receptor antagonists).

Study Design: Qualitative study using content analysis methodology and semi-structured interviews followed by member checking.

Methods: We used purposeful sampling and conducted semi-structured interviews of primary care and cardiology clinicians via video teleconference (Zoom) between December 2020 and February 2021. After discussing prescribing challenges, participants discussed potential solutions. Participants were invited to participate in member checking focus groups to establish credibility of the preliminary interview findings. All sessions were recorded and professionally transcribed verbatim. An inductive coding and analysis process was used to develop a codebook and apply it to the transcripts.

Results: We interviewed 33 clinicians (13 cardiology) and did member checking with 10. Six themes of solutions were identified: 1) comanagement, 2) education strategies, 3) explicit risk vs. benefit data, 4) patient engagement, 5) policy changes, and 6) data integration, summary, and sharing. Each theme was further characterized by explicit examples. Participants noted many new technological solutions to address these themes, including enhanced EHR integration, creation of novel alerts, and incorporation of patient wearable device data with EHR data.

Conclusion: Our findings suggest clinicians want expanded use of technology and automation to augment existing approaches to address challenges to prescribing HFrEF medications. The findings from this study can be used to strategically design interventions to improve prescribing of chronic medications for HFrEF.

Sat-14. Evaluation of IV Sotalol Utilization Patterns and Protocol Adherence

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Introduction: Intravenous (IV) sotalol is currently FDA approved for the maintenance of normal sinus rhythm in patients with symptomatic atrial fibrillation/atrial flutter. Administering an IV loading dose of sotalol before switching to the oral maintenance regimen can achieve steady state plasma concentrations within 1 day, compared to 2-3 days with oral therapy. Due to the potential reduction in hospital length of stay, IV sotalol was added to formulary with strict monitoring criteria and documentation requirements.

Research Question or Hypothesis: Investigate the clinical outcome, utilization patterns, and adherence to approved restrictions for use criteria for intravenous sotalol at Saint Luke's Hospital of Kansas City.

Study Design: Single center, retrospective, medication use evaluation

Methods: Adult patients were included if they received IV sotalol from November 1st, 2021, to April 6th, 2023. The primary outcome was hospital discharge within 24 hours of admission. Secondary outcomes included hospital discharge within 48 hours of admission and adherence to required components of IV sotalol monitoring and documentation.

Results: A total of 42 patients underwent IV sotalol loading. A majority (60%) were male, with a median age of 71 years old. The most common indication for IV sotalol was atrial fibrillation/atrial flutter (88%). No patients were discharged within 24 hours of admission; however, 39 patients (93%) were discharged within 48 hours of admission. IV sotalol was well tolerated, with no observed infusion interruptions due to hemodynamic instability or QT prolongation. A total of 38 patients (90%) were discharged in sinus rhythm, though 18 patients (47%) underwent cardioversion. Adherence to restrictions for use criteria was poor, with only 1 patient (2%) having met all required documentation requirements.

Conclusion: Intravenous sotalol was well tolerated, with a majority of patients discharged within 48 hours of admission. Opportunities to improve adherence to restrictions for use criteria at our institution remain.

Community Pharmacy Practice

Tues-23. Pharmacy Students' Knowledge and Attitudes About the Therapeutic Uses of Psilocybin ("Magic Mushrooms")

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Introduction: Recent data suggest psilocybin has potential therapeutic value. Pharmacists may be strategically placed to influence the recommendation and administration of psilocybin for therapeutic use in patients. With the science being somewhat nascent, few studies have investigated pharmacy students' perceptions, knowledge, and attitudes regarding psilocybin-assisted therapy.

Research Question or Hypothesis: To explore pharmacy students' perceived knowledge, beliefs, and attitudes about psilocybin for therapeutic use.

Study Design: A cross-sectional design was used to collect data from a sample of pharmacy students using an online, anonymous questionnaire via REDCap between March-April 2023.

Methods: The questionnaire was distributed to all the students (N=557) enrolled in a college of pharmacy in Georgia, United States. The survey contained measures using single items and Likert-type response sets to assess their perceived knowledge of medical psilocybin, concern for potential adverse effects, and perception regarding

psilocybin's therapeutic effectiveness. Hypothesis testing was performed using multivariate linear regression in SPSS statistical software.

Results: One hundred and sixty-one questionnaires were completed (28.9% response rate). Regression modeling produced a statistically significant equation: ($F(5, 121) = 35.611$, $p < 0.001$), with an $R^2 = 0.595$ (adjusted $R^2 = 0.579$), indicating that greater perceived knowledge about medical psilocybin, less concern over possible adverse effects of psilocybin use, greater belief in the decriminalization of psilocybin for recreational use, greater belief in the decriminalization of psilocybin for therapeutic use, and more desire to learn more about therapeutic psilocybin were associated with more positive perceptions about medical psilocybin.

Conclusion: Due to its therapeutic potential, interest in psilocybin will most likely gain momentum among researchers, pharmacists, and patients. For this reason, it may be important to understand future pharmacist perceptions, knowledge, and attitudes about its use. Moreover, pharmacy educators may need to consider curricular advancements regarding depicting not only the potential therapeutic effects of psilocybin, but its possible risks.

Sat-17. Assessing North Carolina Pharmacists' Knowledge, Attitudes, And Practices of Opioid Management within Different Patient Populations

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Introduction: Racial disparities in opioid overdose exist, with Black, Indigenous, and Hispanic individuals experiencing higher rates of deaths. Harm reduction strategies, such as opioid deprescribing and naloxone dispensing, have been identified as ways to prevent opioid overdose. Pharmacists can implement these harm reduction strategies, but little is known about their implementation across racial or ethnic groups.

Research Question or Hypothesis: Are there gaps in pharmacist knowledge, attitudes, and/or practices (KAP) of opioid management practices, including opioid deprescribing and naloxone dispensing, broadly and across different patient racial or ethnic groups?

Study Design: Cross-sectional, survey-based study

Methods: A web-based KAP survey was distributed via email to NC pharmacists using a modified Dillman's method. Descriptive statistics were used to analyze pharmacists' demographics, knowledge, attitudes, and practice data. Attitudes data were further analyzed using one-way ANOVA tests and Tukey's post-hoc analyses.

Results: The survey response rate was 5.6%. Respondents were mostly female (59.1%) and White (86.6%). Approximately half of pharmacists knew the correct opioid morphine milliequivalent (MME) cutoffs considered to be high risk (47.7%) and not to be exceeded (51.9%). Pharmacists overestimated that 23.7% of patients that take chronic opioids have access to naloxone. Pharmacists believed that Black patients were more likely to adhere to a naloxone taper compared to any other race or ethnicity and Hispanic patients were more likely to adhere to naloxone treatment compared to any other race or ethnicity. Finally, 91% of pharmacists knew what an opioid taper was, but 77% of pharmacists had never designed one.

Conclusion: Gaps in knowledge may contribute to disparities in opioid management. Pharmacists' attitudes contribute to biases in opioid management practices and practices related to opioid tapering may limit the pharmacists' current role. More education is needed so pharmacists can play an increased role in opioid management across all patient populations.

Critical Care

Sun-42. Dexmedetomidine's hemodynamic effects on non-mechanically ventilated patients

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Introduction: Dexmedetomidine has been shown to impact hemodynamic stability during its use in mechanically ventilated patients. However, those findings are difficult to extrapolate in situations not involving invasive ventilation. There is an increased use of dexmedetomidine for agitation in non-ventilated patients, but data is limited regarding the safety and benefit in this population.

Research Question or Hypothesis: What is the incidence of hemodynamic compromise after dexmedetomidine initiation in non-mechanically ventilated patients?

Study Design: A retrospective, single cohort, IRB-approved, pre-post study.

Methods: Adult patients initiated on continuous intravenous dexmedetomidine outside of invasive mechanical ventilation were evaluated for inclusion. Data was collected from an electronic health record 24-hours prior to and 24-hours following dexmedetomidine initiation. The primary endpoint was a composite rate of hemodynamic compromise after dexmedetomidine initiation. Differences in outcomes between pre- and post-dexmedetomidine time periods were compared using McNemar's test or Wilcoxon signed-rank test for nominal and continuous data, respectively.

Results: The study included 124 patients. Dexmedetomidine was initiated at a median dose of 0.2mcg/kg/hour (IQR 0.2-0.3) and continued for a median of 17.1 hours (IQR 6-41.1). There was a higher rate of hemodynamic compromise observed following dexmedetomidine initiation compared to the pre-dexmedetomidine time period (53.2 % vs 36.3%, $P = 0.002$). There was less benzodiazepine use (29.8% vs. 45.2%, $p=0.001$) but no difference in antipsychotic therapy (41.1% vs 35.5%, $p=0.31$) observed following dexmedetomidine initiation compared to the pre-initiation period. Patients experiencing hemodynamic compromise post-dexmedetomidine were associated

with worse clinical outcomes compared to patients without hemodynamic compromise, with higher rates of invasive ventilatory support initiation (18.2% vs. 5.2%, p=0.027), ICU length of stay (median 7.3 vs. 4.7 days, p=0.047), and hospital length of stay (median 15 vs. 8.5 days, p=0.002).

Conclusion: When used in non-mechanically ventilated patients, dexmedetomidine significantly impacted hemodynamic stability. Further studies are warranted to determine the risks and benefits of employing dexmedetomidine in this population.

Tus-29. Evaluation of the equivalence of IV push and IV piggyback ceftriaxone in critically ill patients

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Introduction: Many healthcare systems have utilized IV push (IVP) administration of medications as a fluid-sparing measure due to ongoing shortages. One such medication is ceftriaxone.

Research Question or Hypothesis: How does the efficacy of IVP ceftriaxone compare to IV piggyback (IVPB) in critically-ill patients?

Study Design: Retrospective, observational cohort study

Methods: Adult intensive care unit (ICU) patients admitted between March 2016-January 2021 who received ceftriaxone ≥ 72h were included. Exclusion criteria were infection with ceftriaxone-intermediate/resistant pathogens, pregnancy, or receipt of both IVPB and IVP. Data points included baseline characteristics, ceftriaxone dose/duration, and clinical outcomes. The primary outcome was treatment failure, defined as a composite of inpatient mortality and escalation of antibiotic therapy due to worsening clinical status. Secondary outcomes included individual composite outcome components. Categorical and continuous variables were evaluated with chi-squared and independent sample t-test, respectively. Binary logistic regression was applied to the primary outcome. P-value <0.05 was considered significant.

Results: In total, 201 IVP and 200 IVPB patients were included with mean SOFA scores of 6.4 and 5.4, respectively (p=0.002). Sepsis and septic shock were more common in the IVP group (sepsis: 56.2% vs. 30.5%, p<0.001; septic shock: 29.4% vs. 10.5%, p<0.001). Treatment failure was more common with IVP administration (37.8% vs. 19.5%, p<0.001), as were each of the individual composite outcome components (all-cause hospital mortality: 21.4% vs. 9.5%, p<0.001; antibiotic escalation: 25.4% vs. 11.5%, p<0.001). After controlling for potentially confounding variables including age, gender, and presence of a positive culture, IVP ceftriaxone (odds ratio [OR] 2.33, 95% confidence interval [CI] 1.43–3.79), therapy duration (OR 0.86, 95% CI 0.78–0.96), and SOFA score (OR 1.18, 95% CI 1.1–1.27) were associated with treatment failure.

Conclusion: IVP ceftriaxone was associated with higher treatment failure. Limitations include single-center retrospective design and higher acuity in the IVP group. Nevertheless, findings suggest a possible benefit to IVPB ceftriaxone in critically ill patients.

Sat-18. Comparison of Continuous Synthetic Opioids to Morphine on Time to Extubation in Critically Ill Adults

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Introduction: While synthetic opioids have a faster onset and shorter half-life than morphine, it remains unclear whether their use is associated with faster extubation.

Research Question or Hypothesis: Is there difference in the time to first successful extubation in adults who received continuous synthetic opioid(s) (fentanyl, remifentanil, or both) with or without morphine (SO±M) versus continuous morphine (M)?

Study Design: Prospective cohort study.

Methods: We evaluated adults admitted to a 32-bed mixed Dutch ICU between 2011-2019 who received >24h of invasive mechanical ventilation (MV) and ≥24 hours of continuous opioids. Patients who died prior to extubation or required ≥14d of MV were excluded. Successful extubation was defined as MV liberation ≥48h or ICU discharge without MV. A Cox proportional hazards regression model that accounted for *baseline* [age, medical (vs. surgical) admission, APACHE-IV, BMI, Charlson Comorbidity Index, a high-opioid use condition] and *daily* [opioid exposure, benzodiazepine and propofol use, severe pain (BPS≥7/CPOT≥5), SOFA, delirium, coma] variables was constructed.

Results: Among the 1695 patients meeting study criteria, 833 (49%) were allocated to the SO±M group (3% fentanyl only, 14% remifentanil only, 83% both) and 862 (51%) to the M group. At ICU baseline, the SO±M (vs. M) group was more likely medical (45% vs. 24%, p<0.01), to be sicker [APACHE-IV, 64(48–80) vs. 55(42–70), p<0.01], and to have a high-opioid use condition(s) (20% vs. 13%, p<0.01). The SO±M(vs. M) group had a higher daily opioid exposure [52(14–262) vs. 11(6–24) IVMEQ, p<0.01] and required more days of mechanical ventilation [5(3–8) vs. 3(2–4), p<0.01]. Administration of SO±M

(vs. M) was associated with a decreased daily probability of being successfully extubated (adjusted hazard ratio=0.49, 95%CI 0.41–0.59).

Conclusion: After adjusting for baseline and time-varying covariates, we found use of SO±M (vs. M) to be associated with a 51% reduced daily likelihood of being successfully extubated compared to morphine alone. Additional research is needed to confirm these findings.

Mon-48. Evaluation of medication regimen complexity, severity of illness, and ICU mortality

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Introduction: Characterizing relationships among medication use in the intensive care unit (ICU), severity of illness, and mortality is an important next step in ICU prediction models.

Research Question or Hypothesis: The objective of this study was to explore the association between MRC-ICU at 24 hours and mortality and moreover whether the addition of MRC-ICU to baseline severity of illness models improves mortality prediction.

Study Design: In this observational cohort study, a random sample of 1,000 adults admitted ≥24 hours to the ICU were included.

Methods: The primary outcome of mortality was assessed via area under the receiver operating characteristic (AUROC) via regression modeling. Medication regimen complexity was evaluated at 24 hours using the MRC-ICU scoring tool. Baseline demographic features were collected and severity of illness was characterized using both the Acute Physiology and Chronic Health Evaluation (APACHE II) and the Sequential Organ Failure Assessment (SOFA) score.

Results: While univariate analysis showed increase in hospital mortality with increasing MRC-ICU, after controlling for baseline APACHE-II and SOFA score, the MRC-ICU score was associated with a 6% decrease in odds of hospital mortality (OR 0.94, 95% CI 0.90-0.99, p-value < 0.01).The highest AUROC achieved was 0.80, which included variables for severity of illness and medication regimen complexity.

Conclusion: Medication regimen complexity may be an important factor for incorporation into ICU prediction models as medications can serve as both independent risk factors for positive and negative ICU outcomes.

Sat-20. Construction of a common data model for artificial intelligence to interpret ICU medication regimens

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Introduction: Artificial intelligence (AI) can be used to improve critically-ill patient outcomes, and the development of a common data model (CDM) is required for seamless data exchange among various AI applications. Creation of this CDM aims to standardize drug and clinical features for longitudinal use in clinical decision support systems (CDSS) and pharmacotherapy optimization in the intensive care unit (ICU).

Research Question or Hypothesis: Is creating a standardized CDM of ICU medications feasible for supporting clinical decision-making software?

Study Design: Retrospective cohort study

Methods: An expert panel comprised of nine critical care pharmacists participated in a five-round modified Delphi process to compile medication and clinical features for a CDM involving ICU medications. A list of drug formulations based on the medication regimen complexity-intensive care unit (MRC-ICU) scoring tool was derived from the electronic health record of adult patients admitted to an institution's ICU from 2015 to 2020. The primary outcome was to develop features for inclusion in the CDM. The secondary outcome was to utilize drug information resources to input data in all features of the CDM for each drug formulation.

Results: The panel finalized a list of 1,463 drug formulations, including 332 unique drugs, with 889 formulations pertaining to the MRC-ICU score and 574 formulations related to common ICU medications. Eighty-seven drug formulation features were defined by the expert panel, which were then split into subcategories: medication clinical features (n=73) and drug product features (n=14). The finalization of CDM features satisfied the primary outcome, and coding of the 1,463 drug formulations fulfilled the secondary outcome.

Conclusion: A CDM that analyzes MRC-ICU related drug formulations was developed and has the potential to enhance an AI program's feedback and prediction of various events in the ICU. Without an established CDM, use of AI in CDSS is limited. Future research should validate this CDM and gauge its impact on AI applications.

Sat-21. Beta-lactam de-escalation reduces the risk of new antibiotic resistant gram-negative pathogens in critically ill patients with sepsis

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Introduction: Antibiotic de-escalation is a commonly used strategy that attempts to balance the need for early administration of appropriate antibiotics while reducing the risk of resistance development by narrowing the spectrum of antibiotics. However, the clinical evidence assessing its impact is limited.

Research Question or Hypothesis: De-escalation using a novel beta-lactam spectrum score (BLSS) approach is associated with a decreased risk of new resistance in critically ill patients.

Study Design: Single-center retrospective cohort study.

Methods: Adult patients with severe sepsis or septic shock from an academic medical center were enrolled between 2010 and 2017. BLSS were captured using the antimicrobial spectrum index method and BLSS of ≥ 7 for two consecutive days denoted cohort entry. Patients were grouped into three categories: 1) de-escalation, 2) no change, or 3) escalation, using the novel cumulative BLSS during follow-up to 60 days. Primary outcome was the isolation of a new drug-resistant Gram-negative bacteria from a clinical culture. A time-dependent Cox proportional hazards model with death as a competing risk was utilized, adjusted for multiple covariates.

Results: 7,748 patients were included, with 1,579, 4,805, and 1,364 included in the de-escalation, no change, and escalation groups, respectively. The overall rate of new resistance was 8.3%, with 7.2%, 8.9%, and 7.8% in the de-escalation, no change, and escalation groups, respectively. The hazard ratio of developing new Gram-negative resistance with de-escalation vs. no-change: 0.684 (95% CI: 0.547 to 0.855); de-escalation vs. no change + escalation: 0.861 (95% CI: 0.750 to 0.988); de-escalation vs. escalation: 1.251 (95% CI: 0.901, 1.738).

Conclusion: De-escalation was associated with a decreased risk of new resistance development compared to no change and/or escalation. This represents the largest study to date showing the utility of de-escalation in the prevention of antimicrobial resistance.

Sun-43. Assessment of a pharmacist-driven venous thromboembolism (VTE) prophylaxis protocol in critically ill patients

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Introduction: Standardized dosing of venous thromboembolism (VTE) prophylaxis has been shown to be suboptimal in critically ill patients. A pharmacist-led protocol was implemented to select and optimize VTE prophylaxis in this population.

Research Question or Hypothesis: Does VTE prophylaxis dosed via a pharmacist-driven protocol confer a similar bleed risk compared with standard VTE prophylaxis?

Study Design: Retrospective cohort study utilizing data from an electronic medical record between the dates of January 1st 2022 to November 11th 2022 (protocolized group) and January 1st 2019 through November 11th 2019 (standard group).

Methods: Patients were included if they were admitted to the medical intensive care unit (MICU) and received VTE prophylaxis via the pharmacist driven-protocol or standard VTE prophylaxis. The protocol selected and adjusted doses based on patient renal function and body mass index (BMI). The primary outcome compared frequency of bleeding events, as defined by the International Society of Thrombosis and Hemostasis. Secondary outcomes included frequency of VTE events, hospital and ICU length of stay, and in-hospital mortality. Data were analyzed using Fisher's-exact or Chi-square and Mann Whitney-U tests as appropriate and alpha was set at 0.05.

Results: Overall, 147 patients were included; 87 in the protocolized group and 60 in the standard group. Patients were approximately 60 years old, and there were more females in the standard (32 (53.3%)) versus the protocolized group (32 (36.8%), p=0.05). Patients had a median BMI of approximately 29 kg/m^2 and a median serum creatinine of approximately 1.0 mg/dL. VTE and bleed related risk factors were similar. Frequency of bleeding and VTE events did not differ between the protocolized versus standard group (4.6% vs. 3.3%, p=1.00 and 2.3% vs. 3.3%, p=1.00; respectively). ICU and hospital length of stay and hospital mortality did not differ between the groups.

Conclusion: A pharmacist-driven VTE prophylaxis protocol appears to be safe in terms of bleeding risk in most critically-ill patients.

Sun-38. Impact of Darbepoetin Alfa Use in Trauma Patients Abstaining From Blood Products

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Introduction: Many individuals abstain from the use of blood products or components due to religious beliefs or cultural practices. Following a traumatic injury, blood loss and inflammatory processes are

associated with anemia, decreasing oxygen delivery to tissues and organs. This warrants the need for alternative treatment methods to blood transfusions in this population. Current literature investigates the use of epoetin alfa, an albumin-containing erythropoiesis stimulating agent (ESA), to treat anemia for this indication, however, this may be problematic as albumin is a blood-derived product. Darbepoetin alfa, an albumin-free alternative, is the formulary ESA at our institution for this population.

Research Question or Hypothesis: The objective is to describe the impact of darbepoetin alfa on anemia and outcomes in trauma patients who abstain from blood products.

Study Design: This was a single center, retrospective, descriptive study.

Methods: Patients >/= 18 years of age admitted to a trauma service between August 1, 2010 to August 1, 2022 with anemia (hemoglobin < 7 g/dL or hematocrit < 21%) who abstained from blood products and received darbepoetin alfa were included. The primary outcome was time from onset to resolution of anemia. Safety outcomes included occurrence of myocardial infarction and/or venous thromboembolism. Descriptive statistics were used to summarize population characteristics and outcomes.

Results: Nine patients met inclusion criteria with a median admission hemoglobin of 10 g/dL. The median time from onset to resolution of anemia was nine and eight days using hemoglobin and hematocrit, respectively. One patient experienced a type II non-ST elevation myocardial infarction.

Conclusion: In this cohort, the use of darbepoetin alfa appeared to be a safe treatment option to treat anemia secondary to trauma for patients who abstain from blood products. Future studies are needed to assess epoetin alfa versus darbepoetin alfa, darbepoetin alfa versus non-darbepoetin alfa use, and hemoglobin cutoffs for darbepoetin alfa administration.

Mon-49. Norepinephrine vs Vasopressin Weaning in Recovery Phase of Shock: Is There a Right Order?

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Introduction: Society of Critical Care Medicine (SCCM) recommends use of vasoactive medications to maintain adequate mean arterial pressure (MAP) in septic shock. Norepinephrine (NE) is recommended as a first-line vasopressor followed by vasopressin (AVP) if MAP goal is not achieved. Although the guidelines are specific on the order of NE and AVP initiation, there is less clarity on weaning order. Additionally, there is conflicting literature on which vasopressor to wean first.

Research Question or Hypothesis: Is there a difference in incidence of hypotension depending on the order of vasopressor discontinuation?

Study Design: Single center, retrospective cohort study from January 2019 to December 2022.

Methods: Patients ≥ 18 years of age admitted to the ICU receiving concurrent NE and AVP infusions for septic shock were included. Patients excluded if they had a diagnosis of mixed shock or were on other parenteral vasoactive therapy at the time of NE or AVP weaning. Primary outcome was incidence of hypotension at 6, 12 and 24 hours. Secondary outcomes were hospital and ICU mortality, vasoactive medication duration, and incidence of acute kidney . Categorical variables are summarized as frequencies and percentages and Continuous variables are summarized as means and standard deviations

Results: Total of 42 patients (NE=27, AVP= 15) included in the analysis. Baseline demographics were similar in both arms. There was no statistically significant difference in the incidence of hypotension between the groups and any of the prespecified time points. In-hospital mortality was statistically significant higher in patients who were weaned from NE first (p=0.042).

Conclusion: This is the first analysis to show order of vasopressor weaning showed no statistical difference in the occurrence of hypotension. The order of vasopressor discontinuation may affect in-hospital mortality rates in patients when NE is weaned prior to AVP. More patient data is needed for further evaluation.

Mon-50. Evaluation of albumin and loop diuretic combination therapy for deresuscitation in critically ill patients with hypoalbuminemia

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Introduction: Critically ill patients commonly develop volume overload after receiving large amounts of intravenous (IV) fluids to achieve hemodynamic stability. Volume overload is associated with increased intensive care unit (ICU) length of stay (LOS) and mortality. Strategies to deresuscitate patients once they are no longer requiring fluids decrease these poor outcomes. Hyperoncotic albumin could theoretically increase the effectiveness of loop diuretics in hypoalbuminemic patients.

Research Question or Hypothesis: The goal of this study was to determine if hyperoncotic albumin combined with loop diuretics enhances urine output compared to loop diuretic monotherapy in patients with hypoalbuminemia.

Study Design: This study was a single center retrospective cohort from September 2020 through August 2022.

Methods: Included patients were ≥19 years old, admitted to an ICU, received an IV loop diuretic, and had hypoalbuminemia. Patients who received hyperoncotic albumin or an IV loop diuretic for an alternative indication, were pregnant, received any renal replacement therapy concurrently with the loop diuretic or albumin, or did not receive the initial loop diuretic dose within 1 hour before or 4 hours after albumin receipt in the combination therapy group were excluded. The primary

outcome was 24-hour urine output (mL/kg/hr). Secondary outcomes included 24-hour net fluid balance, mortality, ICU LOS, and hospital LOS. Nominal data was analyzed using the chi-squared test and continuous data using an unpaired t-test or Wilcoxon rank sum.

Results: One hundred twenty-one patients were analyzed. Patients who received combination therapy had higher UOP (1.81 vs 1.43 mL/kg/hr) ($p = 0.026$). There was no difference in net 24-hour volume status, ICU or hospital LOS, or mortality. Albumin administration was not associated with higher urine output in patients with lower albumin levels.

Conclusion: Patients receiving albumin and loop diuretic combination therapy had increased urine output, likely influenced by increased intake, but did not have improved clinical outcomes.

Sat-19. Clonidine Is Associated with a Faster Resolution of Incident ICU Delirium than Antipsychotics

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Introduction: Clonidine or antipsychotics are often used to treat ICU delirium despite their lack of proven benefit and guidelines not recommending routine use. A pharmacologic intervention that reduces delirium faster, when combined with non-pharmacologic delirium reduction strategies, may improve patient outcomes.

Research Question or Hypothesis: Is there a difference in the time to first delirium resolution in critically ill adults with incident delirium who are treated with clonidine versus an antipsychotic (haloperidol/quetiapine)?

Study Design: Prospective cohort study.

Methods: We included consecutive adults admitted to a 32-bed mixed Dutch ICU between 2011–2019 who first developed delirium (a day with ≥1 positive CAM-ICU) after ICU admission, and who were administered clonidine or an antipsychotic (haloperidol/quetiapine) after delirium occurrence. Patients who received both clonidine and an antipsychotic or experienced coma after delirium were excluded. The first post-treatment day without a positive CAM-ICU denoted delirium resolution. A Cox proportional hazards regression model that accounted for baseline [age, medical (vs. surgical) admission, APACHE-IV score, Charlson Comorbidity Index] and daily (SOFA, invasive mechanical ventilation, opioid use, and benzodiazepine/propofol use) variables, and daily use of clonidine (or antipsychotics), was constructed.

Results: At baseline, the clonidine (n=77) [vs. antipsychotic (n=149)] group was younger [median (IQR) 61(51–70) vs. 66(58–76), p<0.01] and more likely medical (52% vs. 34%, p=0.02); severity of illness (APACHE-IV) was similar. Total treatment duration until delirium resolution or ICU discharge was similar [clonidine 2(1–2) vs. antipsychotic 2(1–3) days, p=0.42]. While delirium resolved in a similar proportion of patients (clonidine 70% vs. antipsychotic 61%, p=0.23), clonidine (vs antipsychotic) use was associated with a greater daily probability of ICU delirium resolution (adjusted hazard ratio=1.83, 95% CI 1.23–2.70).

Conclusion: After adjusting for both baseline and time-varying covariates, treatment with clonidine, rather than haloperidol or quetiapine, was associated with an 83% increased daily rate of ICU delirium resolution. Additional research is needed to confirm these findings.

Sun-44. Pharmacokinetic analysis of IV push cefepime in critically ill patients with sepsis

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Introduction: Intravenous push (IVP) administration of cefepime increases ease of preparation and limits the need for small volume parenterals. The effect on pharmacokinetic/pharmacodynamic (PK/PD) parameters is unknown, but may be more relevant for time-dependent agents like cefepime that require frequent dosing and in critically ill patients who have altered PK/PD.

Research Question or Hypothesis: IVP administration of cefepime results in decreased PK target attainment in critically ill patients with sepsis compared to historical controls receiving intravenous piggyback (IVPB) administration.

Study Design: IRB-approved, prospective, noninterventional, PK study

Methods: Hospitalized adult patients receiving cefepime were included if they had a central/midline catheter, intensive care unit length of stay ≥48 hours, creatinine clearance >30 mL/min without renal replacement therapy, and diagnosis of sepsis. Blood samples were obtained at cefepime steady state immediately before a dose. Serum concentrations of cefepime were measured using high-performance liquid chromatography with ultraviolet detection. Patient characteristics were collected from the electronic health record. The primary outcome was steady-state cefepime trough concentration, which was compared to a historical IVPB control and between dosing regimens using the Mann Whitney-U.

Results: Patients (n=16) had a median age of 69 years, BMI 30.6, CrCl 96 mL/min, and SOFA score 8. Ten (63%) were male and 14 (88%) had septic shock. Half of the patients received cefepime 2 g every 12 hours and half received 2 g every 8 hours. The median cefepime trough concentration was 22 mg/L (range 2–63 mg/L), which was numerically higher than a historical control in patients receiving IVPB cefepime (median trough 7 mg/L, range 2-21 mg/L). Trough concentrations were similar in patients who received cefepime at 8-hour and 12-hour intervals (25 vs 22 mg/L, p=0.959).

Conclusion: Considerable variability in trough concentrations was observed in critically ill patients with sepsis who received IVP cefepime. Methods to personalize cefepime dosing should be evaluated to optimize PK/PD in this heterogeneous population.

Drug Information

Tues-31. Renal Dosing Content of 4 Drug Information Resources Commonly Used in the United States

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Introduction: Inclusion of numeric, actionable renal dosing recommendations in drug information (DI) resources enhances the safe use of nephrotoxins.

Research Question or Hypothesis: The purpose of this study was to characterize renal dose recommendations in 4 common DI resources.

Study Design: Systematic, descriptive comparison of tertiary DI resource content.

Methods: A list of nephrotoxins (N=153) was generated from previously published lists that individually focused on adult critical care (n=94), hospitalized children (n=52), and primary care/geriatrics (n=52). Renal dosing information was collected for each drug from the package insert, Lexi-comp, Micromedex, and Clinical Pharmacology. Dosing recommendations were categorized using a 6-category scale (numeric [ie, dosing or statement to avoid with a measure of renal function], nonnumeric [ie, use caution or monitor closely without specific dosing or renal function cutoffs], contraindicated, no dose adjustment required, no recommendation, drug missing from the source).

Results: Actionable renal impairment recommendations (numeric, non-numeric, contraindicated, no dose adjustment required) in the package insert, Lexi-comp, Micromedex, and Clinical Pharmacology were 87.6%, 97.4%, 94.1%, and 98.7%, respectively. Numeric recommendations were available for 53.6% to 75.2% of medications, depending on the source. Actionable recommendations for hemodialysis, peritoneal dialysis, continuous renal replacement, and hybrid dialysis modalities were most common in Lexi-comp (79.1%, 72.5%, 58.8%, and 49.7% of medications, respectively). Actionable pediatric (71.2%) and geriatric (41.2%) recommendations were most common in Lexi-comp and Clinical Pharmacology, respectively. Geriatric recommendations were generally nonnumeric (78.3% to 100% of geriatric recommendations). Actionable recommendations for adult critical care, hospitalized children, and primary care medications were prevalent (87.2% to 100%, 86.5% to 96.2%, and 98.1% to 100%) and were mainly numeric.

Conclusion: DI resources included actionable renal dosing recommendations for most known nephrotoxins. Numeric recommendations for renal replacement, pediatric, and geriatric settings were generally lacking. Resource publishers are urged to include numeric, actionable renal dosing content, when available.

Education/Training

Tues-41. Building Student Empathy Through a Decision-Making Game

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Introduction: Doctor of Pharmacy programs are charged with developing students' empathy based on the 2016 Accreditation Council for Pharmacy Education (ACPE) Standard 3 and the 2022 Curriculum Outcomes and Entrustable Professional Activities (COEPA). While empathy is essential to optimal patient care, its subjective nature makes it challenging to teach, and literature is lacking on best teaching practices. We developed a novel approach to teach and assess empathy in a pharmacy classroom simulation. Our study aimed to utilize a validated empathy scale to quantify the impact of this learning experience on students' empathy development.

Research Question or Hypothesis: Will a simulated decision-making game in a pharmacy skills lab course improve empathy in pharmacy students?

Study Design: Cohort-based quality improvement project.

Methods: Third year pharmacy students participated in a classroom decision-making game that simulated a month in a patient's life and issues related to the cycle of poverty. Prior to the game, students completed a voluntary, anonymous baseline demographics survey. They also completed a pre- and post-survey of the validated empathy tool, the Kiersma-Chen Empathy Scale (KCES-R), to measure the change in the scale score following the game. Students also provided free-text comments in the post-survey. We used descriptive statistics

for demographic data, Shapiro-Wilk test of normality, and Wilcoxon Signed-Rank test for survey scores (SPSS Version 29).

Results: Pharmacy students (n=37) showed a statistically significant improvement in empathy with an overall increase in composite KCES-R scores ($z = -5.071$, $p < 0.001$) after participating in the empathy game class session. Each of the 14 KCES-R items showed a significant increase ($p<0.05$) after the learning experience. Students' free-text responses indicated the activity was insightful and effective for developing empathy in pharmacy students.

Conclusion: The empathy game simulation was a successful approach to increase empathy in third-year pharmacy students.

Sun-53. Academic resilience among Doctor of Pharmacy students in their first professional year of study

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Introduction: Studies have revealed that challenges related to the COVID-19 pandemic continue to be a concern for students in higher education. Numerous academic consequences have been reported and include decreased motivation and learning capacity, reductions in academic performance and achievement, increased mental health conditions, and reduced likelihood of sustainable employment.

Research Question or Hypothesis: To assess students' academic resilience upon return to in-person classes post-pandemic campus closures.

Study Design: This is a quantitative survey research study.

Methods: The reliable and validated Academic Pharmacy Resilience Scale (APRS-16) was sent electronically to all first professional year Doctor of Pharmacy students (n = 217) who had completed most of their coursework during the pandemic through remote learning modalities. Participation was voluntary with study information provided and informed consent obtained/implied upon survey completion. Students who completed all components of the APRS-16 received campus dining credit for their time. The University Institutional Review Board granted this study "exempt" status.

Results: A total of 158 students (73%) completed the APRS-16 survey. Findings revealed that upon facing a challenging academic situation, the majority of students felt *likely or somewhat likely* to: (1) begin doubting their chances to succeed academically; (2) be disappointed and probably get depressed; (3) think that everything was ruined or going wrong; (4) be concerned about their chances of getting the job or residency they wanted; (5) try to think of new solutions; (6) use past successes to help motivate themselves; (7) set goals for achievement; (8) seek encouragement from family and friends; (9) try to think about their strengths and weaknesses to help them; and (10) see the situation as temporary.

Conclusion: Findings support the continued availability, and potential expansion, of current academic and mental health services for students. Consequences of isolated learning environments remain an issue, and universities should aim to identify and address these challenges to ensure student support and success.

Sun-52. Integration of Intentional Critical Thinking Activities in a Pharmacy Skills Lab Curriculum

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Introduction: Persky et al. discussed the importance of building the framework of critical thinking into pharmacy education. Within our school of pharmacy's skills lab, students are expected to use high-level clinical reasoning; however, there are limited intentional activities to teach critical thinking. Additionally, it is not known how these types of activities would impact student perception of their critical thinking skills.

Research Question or Hypothesis: The purpose of this study was to evaluate the impact of intentional critical thinking activities in a skills lab setting. Our hypothesis was that adding these activities would improve student confidence in critical thinking skills.

Study Design: This was an IRB exempt one-group pretest-posttest survey-based study of students within one semester in a skills lab sequence.

Methods: P2 and P3 students completed three intentional critical thinking activities during skills lab sessions. For P2s, the cases focused on the identification and prioritization of clinically relevant problems. For P3s, attention was directed towards communicating patient specific issues. All participating students (n=180) were invited to take a survey prior to and at the conclusion of the semester. Students were asked to rate their confidence on seven critical thinking objectives using a scale of 1 (low confidence) to 7 (high confidence).

Results: There were 34 responses to the pre-semester survey (26 P2 students, 8 P3 students) and 7 responses to the post-semester survey (7 P2 students). The mean confidence ratings increased for all critical thinking objectives, most notably comparing diverse points of view (pre-semester mean: 6.18; post-semester mean: 7.14) and communicating an effective response or conclusion (pre-semester mean: 6.00; post-semester mean: 7.14).

Conclusion: Due to low response rates, limited conclusions can be made regarding changes in student confidence because of these activities. However, information regarding the activities could provide insight into innovative instructional techniques designed to intentionally target critical thinking within the skills lab setting.

Sat-24. Educational Game Improves Systems Thinking, Socialization, and Collaboration Among Health Professions Students

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Introduction: Systems thinking (ST) explores system components and their interactions to understand outcome emergence. Teaching ST and interprofessional collaboration to health professions students is crucial, but curriculum inclusion lacks information. This study assessed how the game, Friday Night at the ER (FNER), influenced ST and interprofessional socialization.

Research Question or Hypothesis: Does an interprofessional experience involving FNER and structured debriefing affect students' ST, self-assessed interprofessional socialization, and collaboration skills?

Study Design: Pre-post test quasi-experimental design.

Methods: Health professions students from thirteen programs were assigned to attend one 2.5-hour session in Fall 2022 where they played FNER and had a debriefing. The primary outcome was change in students' ST. Before attending, they completed a 28-item survey that included the validated Systems Thinking Scale (STS; 20 items) and modified Interprofessional Socialization and Valuing Scale-9 (ISVS-9; 8 items). After the session, they repeated the survey with an additional question added from the validated Interprofessional Collaboration Competency Attainment Survey and completed an anonymous 9-item, 5-point Likert scale evaluation. Data were summarized as medians or means and compared using Wilcoxon signed ranks or paired sample t-tests, respectively, using SPSS v26 with alpha=0.05.

Results: A total of 626 (90%) students had paired data available to analyze. Median [interquartile range] STS scores increased from pre-to-post-experience (61 [56-71] vs. 72.5 [60-80]; p<0.001). Mean [standard deviation] modified ISVS-9 scores increased from pre-to-post-experience (5.7 [1.0] vs. 6.5 [0.8]; p<0.001). Most students [485 (77%)] perceived that their ability to collaborate improved following the experience. A total of 595 (86%) students completed the post-program evaluation. Most students "agreed" (mean score 4 out of 5) with achieving the learning objectives and that the overall program was of high quality.

Conclusion: An interprofessional experience, consisting of FNER gameplay followed by a structured debriefing can improve ST and interprofessional socialization and collaboration in a large group of health professions students.

Mon-62. Student pharmacist impressions of using ChatGPT to answer clinical questions

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Introduction: In higher education, ChatGPT is purported to enable plagiarism and promote academic dishonesty. In the setting of higher education in the health sciences, the use of ChatGPT is also alleged to inhibit development of critical thinking and communication skills. There is much published about faculty impressions of ChatGPT, but there is paucity of data available to represent student perspectives of ChatGPT.

Research Question or Hypothesis: What are student pharmacists' impressions of using ChatGPT to answer clinical questions?

Study Design: A single-center, observational study.

Methods: Students enrolled in a Geriatrics Elective were assigned five cases about deprescribing, due prior to class. During class, the cases were discussed and then, as a group, we entered the same cases in ChatGPT version 3.5. After class, students completed a seven-question survey to assess their impressions of using ChatGPT to answer clinical questions. Survey questions were open-ended, with no limit on word count. This study was approved as exempt by the IRB, and participation was optional.

Results: Of 20 students, 17 (85%) agreed to complete the survey. Sixteen (94%) of 17 students had heard of ChatGPT, but only 1 had used it. After using ChatGPT in class, 5 (29%) students reported that they did not trust the information provided by ChatGPT and 12 (71%) students reported that they trusted the information "somewhat." Eleven (65%) students would not recommend ChatGPT to geriatric patients, although 5 (29%) students did suggest that ChatGPT could be helpful for some patients. Sixteen (94%) students did not feel comfortable putting health protected information in ChatGPT, however 1 student stated that it was reasonable for a patient to enter their own health information if desired. Of note, ChatGPT provided correct answers on 3 of 5 deprescribing cases.

Conclusion: In all, student pharmacists are aware of ChatGPT but remain dubious about its applicability to practice.

Mon-57. Evaluation of a Doctor of Pharmacy (Pharm.D.) Capstone Research Project Experience

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Introduction: Despite less than 25% of Pharm.D. programs requiring research methods coursework, professional organizations continue to promote student research training. To improve Pharm.D. Candidates' preparation and competency in research, Binghamton University School of Pharmacy and Pharmaceutical Sciences implemented a two-year capstone research project experience (CRPE). This consists of a faculty-mentored research project either in teams of four or individually through a selective research track, two one-credit courses in research methods/education during P3 year, a six-week advanced pharmacy practice experience, and a poster presentation day.

Research Question or Hypothesis: What are Pharm.D. Candidates' research perceptions and outcomes following CRPE?

Study Design: Single-center, cross-sectional survey.

Methods: An anonymous, voluntary, electronic survey was distributed via REDCap® to P4 students (n=80) at the conclusion of CRPE. The

survey asked questions related to demographics, perceptions, and outcomes. Descriptive statistics and Chi-squared test were performed using SPSS version 29.0.0.0.

Results: Fifty-seven completed the survey resulting in a response rate of 71.3%. Demographics: female (73.2%), age mean (26.3±3.02) years, prior degree (65.0%), prior research experience (28.1%), prior publication (8.8%). Post-graduation career placements: residencies (40.4%), fellowships (5.3%), community (35.1%), hospital (12.3%). Study types: retrospective cohort (49.1%), survey (19.3%), basic science (15.8%), governmental database (3.5%), other (12.3%). Nearly all students (89.5%) agreed or strongly agreed CRPE improved their overall knowledge and perceptions of research. Most (77.2%) indicated CRPE met their expectations. Most (75.5%) felt that the P3 course was directly applicable to their projects. Many (45.6%) indicated their research was presented at a national meeting, but only 8.8% indicated it was published/accepted. No statistically significant difference was identified among students with or without prior research experience who strongly agreed/agreed they were pleased with their CRPE outcomes and results (81.3% versus 75.6%, p=0.507).

Conclusion: Among surveyed P4 Pharm.D. Candidates, CRPE improved their research knowledge and was perceived positively overall; however, a potential area for improvement is to promote research publication.

Mon-59. Impact of structural competency training for pharmacy students on their ambulatory care rotation

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Introduction: The National Academies of Sciences, Engineering, and Medicine published a guide to help address the structural/social determinants of health (SSDOH) and highlighted that experiential and collaborative learning are areas that have not yet been adequately explored. There is a gap in pharmacy students' training focused on identifying and addressing SSDOH, specifically in the clinical setting.

Research Question or Hypothesis: How does structural competency training in a clinical learning environment affect students' empathy and confidence in addressing structural/social determinants of health?

Study Design: A mixed-methods study design was utilized to collect quantitative data from pre- and post-surveys and qualitative data on the post-survey.

Methods: Fourth-year pharmacy students participated in a structural health project that included didactic and experiential learning. Students led a home visit with a patient experiencing SSDOH. Afterwards, they completed geo-mapping to compare health outcomes of their patient to the general population and identified resources to help reduce the impact of SSDOH. Students completed an anonymous pre-and-post survey that included 6 questions assessing empathy and 4 questions evaluating knowledge and confidence addressing SSDOH. The post-survey also asked how the project can be improved. Survey results were analyzed using SPSS software and Wilcoxon Signed-ranks test.

Results: A total of 21 pharmacy students were enrolled in the ambulatory care rotation and there were 17 matched responses used for comparison. There were no statistically significant differences found on the impact of empathy after participating in the structural health project. However, there was a statistical difference in students' reported ability to identify SSDOH (p=.007) and confidence in reducing the impact of SSDOH on their patients (p=0.016). For improvement, students would like another debrief session to review additional concepts on SSDOH.

Conclusion: A structural health project did not have any impact on pharmacy students' empathy but did improve their reported ability to identify and confidence addressing SSDOH.

Tues-6. Evaluation of an individual examination remediation policy in a professional pharmacy course: a continuation study

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Introduction: Remediation policies are recommended in pharmacy education to identify poor student performance and implement successful intervention. At St. Louis College of Pharmacy, a biomedical literature evaluation course implemented an in-semester individual remediation examination policy in 2020. Student perceptions and outcomes were assessed in 2022, and course faculty conducted a study again in 2023.

Research Question or Hypothesis: Should in-semester individual examination remediation policies be utilized in professional pharmacy courses?

Study Design: Pre/post-quantitative surveys

Methods: An 11-item pre-remediation questionnaire was administered to all students enrolled in a biomedical literature evaluation course in 2022 and 2023. A matched post-survey was administered to students eligible to remediate individual examinations. Survey items were assessed on a 5-point Likert scale (1=strongly disagree through 5=strongly agree). Grades were analyzed in aggregate. The primary objective of the study was to evaluate an in-semester individual remediation examination policy from multiple course offerings. Descriptive statistics and chi-square tests were utilized as appropriate.

Results: One-hundred sixty-two (83.5%) of 194 students enrolled completed the pre-remediation survey. Students expressed they would prefer to remediate individual examinations (mean 4.7 $\pm$ 0.58) instead of taking one cumulative course remediation examination. Forty-four percent of students who were eligible to remediate at least one examination chose to, with several indicating that remediating

would not enhance overall course grades in the post-survey. Significantly more students improved their examination scores to ≥70% through remediation (n=23 vs. n=12, p<0.001). Mean initial examination scores were 60.6% ± 5.5 and increased to 71.1% ± 13.4 after remediation.

Conclusion: Students enrolled in two iterations of the course preferred to remediate individual examinations and had successful results. In-semester individual examination remediation policies may be a favored remediation strategy in professional pharmacy courses, but adoption could depend on course structure and students' current course performance.

Sun-55. Healthcare professionals and continuous professional development: insights on preferred formats

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Introduction: Due to the constantly evolving technology, treatment guidelines, and steady stream of published research, continuing education is essential to keep healthcare professionals (HCPs) informed. While HCPs have opportunities to improve their clinical knowledge in practice, participating in multimodal continuing professional development (CPD) offers flexibility in consumption of new educational materials. Benefits and barriers exist for all modalities; however, understanding of how HCPs prefer to consume CPD following the COVID-19 pandemic is limited.

Research Question or Hypothesis: Do HCPs prefer in person, virtual, or a hybrid delivery format when participating in CPD?

Study Design: prospective, survey-based research

Methods: In June 2022, the Clinical Education Alliance (CEA) database was surveyed to gauge learner preferences for participating in CPD content. Learners were asked to rank the following CPD formats: live in-person, live online, on-demand online, or a combination of formats, in order of preference. Respondents also provided key demographics including their healthcare profession, practice setting, preference for learning format and primary specialties. Preferred CPD format was compared across learner demographics. Descriptive statistics were used to analyze differences in the data.

Results: A total of 1,212 HCPs responded to at least one question in the survey. For respondents offering practice specialty (n= 909), 24% (n= 223) identified as generalist while 76 % (n= 686) identified practicing as a specialist. Overall, HCP prioritized educational content delivery in the following order: live in-person, followed by live online, on demand online, and finally a hybrid of all formats for their CPD. The primary reasons for this preferred format included dedicated time to focus, increased engagement, and networking opportunities with colleagues.

Conclusion: These findings indicated the importance of live in person interactions and opportunity for engagement during CPD activities. Consideration for these HCP preferences will help engage learners in CPD programs and HCPs in their preferred education delivery formats.

Mon-55. Student Identified Interventions in Transitions of Care (TOC)

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Introduction: Student pharmacists improve readmission rates through the TOC process, but their interventions have not been detailed.

Research Question or Hypothesis: The study summarized interventions and social determinants of health (SDOH) barriers identified by pharmacy students in a TOC service.

Study Design: This was a retrospective chart review of 315 TOC patients between January 2019 and October 2022 from an urban medical residency clinic.

Methods: Pharmacy students followed and met with clinic patients who were admitted to an inpatient service. The meetings included discussions regarding their medications and identification of their conceived barriers and concerns. Information gathered within these meetings was documented in a discharge handoff which included any interventions or follow up needed. Interventions in the handoff were coded into one of three categories: drug therapy, SDOH, or other. The handoff was documented in the patient's chart. The interventions were addressed post discharge by the ambulatory care pharmacist, PCP, or social worker.

Results: Of the 315 admissions reviewed, patients were primarily female (53.62%), white (56.19%), and average age 60 years old (IQR [49-69]). Pharmacy students identified 256 interventions over the 315 total admissions reviewed. The number of interventions per patient ranged from zero (n=193, 61.27%) to five (n=3, 0.95%). The interventions were evenly distributed between the three categories: 32.81% (n=84) drug interventions, 29.69% (n=76) SDOH, and 37.50% (n=96) other concerns. The most common drug intervention was adherence (n=42, 50.00%). SDOH interventions were most commonly tobacco use (n=19, 25.35%) and transportation (n=17, 22.37%), and the most frequent other concerns were need for medication counseling (n=42, 43.75%) and optimization of therapy (n=29, 30.21%).

Conclusion: Student pharmacists successfully identify a variety of interventions during the TOC process. Barriers and interventions were highly variable. Some of the interventions were resolved by pharmacy team improved while others relied on interdisciplinary team members.

Sat-25. U.S. Departments of Pharmacy Practice Tenure-Track Dual-Degree Scholarly Metric Activity Study

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Introduction: Evaluation of academic community contributions to biomedical research is essential to maintenance and improvement of the world's health. Many dual-degree programs have been developed in pharmacy academia to enhance research, but limited data exists to the bibliometrics of these dual-degree faculties.

Research Question or Hypothesis: To quantify journal and faculty metrics among U.S. Department of Pharmacy Practice tenure track (DPP-TT) dual-degree faculty over a 10-year period.

Study Design: Descriptive

Methods: A search of PubMed was performed of dual-degree DPP-TT faculty from 01/01/10-12/31/19. DPP-TT faculty housed in DPP were determined through online published faculty rosters in American Association Colleges of Pharmacy rosters or college/school internet site. For each DPP-TT faculty publication the journal name, journal impact factor (JIF), and number of citations were collected. DPP-TT faculty members' h-index and National Institutes of Health (NIH) iCite weighted Relative Citation Ratio (RCR) value were determined. Descriptive statistics and analysis of variance were used to compare data across demographic strata.

Results: Eighty-six institutions employed 347 dual-degree pharmacy practice faculty that produced 6627 publications. The number of citations/publications was (mean±SD) 37.8±86.8 cited most frequently in pharmacy education and practice, drug therapy and medicine journals with a JIF of 6.4±14.1. Individual faculty h-index was 14.7±12.5 with a mean NIH iCite weighted RCR of 54.8±87.6. The majority of dual-degrees were the Pharm.D. /Ph.D. that had equivalent bibliometrics to the other aggregated 32 dual-degrees.

Conclusion: DPP-TT dual-degree faculty are frequently publishing in the pharmacy and medical literature and the resultant scholarly productivity is contributing to the advancement of science and health.

Mon-54. Implementation of an Interprofessional Tobacco Cessation Resource Program "Carolina Quits Initiative" in the Dental Setting

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Introduction: Tobacco use is one of the leading preventable causes of disease and mortality in the United States compounded by damaging impacts on oral health. Interprofessional collaboration is imperative for successful tobacco cessation among patients, and dental programs across the nation, while well-positioned, do not always provide students with the skills and knowledge to fully address in clinical practice.

Research Question or Hypothesis: Evaluate the educational impact of an interprofessional "Carolina Quits Initiative" tobacco cessation training for Doctor of Dental Surgery (DDS) and Dental Hygiene (DH) students.

Study Design: Single-center, pre-post cohort study analyzing the impact of an orientation training for a 10-week pilot in Spring 2023 within an academic dental clinic setting.

Methods: The "Carolina Quits Initiative" was implemented through interprofessional collaboration among dentistry, dental hygiene, social work, and pharmacy. DDS and DH students were provided a 40-minute lecture and were provided educational materials and patient resources to utilize in clinic. Pre-post-training surveys assessed changes in DDS and DH students' knowledge-based questions analyzed by chi-squared tests and their confidence in tobacco cessation skills using Likert scale statements analyzed by paired t-tests. Significance was set at $p<0.05$.

Results: Ultimately, 50 students (32 DDS, 18 DH) completed both the pre-post-training surveys. While 76% of students endorse (n=38) assessing tobacco use during patient encounters, the majority did not have experience in providing cessation counseling or interprofessional collaboration prior. Compared to students' baseline, post-training surveys revealed significant improvement in knowledge-based questions, along with confidence in: utilizing the ask-advise-connect method, discussing tobacco cessation materials, referring patients to providers/resources, selecting appropriate tobacco cessation products, and interprofessional collaboration on tobacco cessation plans ($p<0.05$).

Conclusion: This interprofessional training demonstrated to be effective in significantly improving students' knowledge and confidence in their skills regarding tobacco cessation and may serve as training guidance to be adapted by dental programs nationwide.

Sun-51. Characterizing full-time practice faculty engagement in manuscript peer review: a prospective study

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Introduction: The peer review process remains an integral part of academic publishing, although increasing requests places significant demand on reviewers, including pharmacy practice faculty who often have clinical responsibilities.

Research Question or Hypothesis: To characterize faculty response to peer review invitations and evaluate barriers to accepting review invitations

Study Design: Prospective, non-interventional study

Methods: Full-time pharmacy practice faculty at 9 U.S. colleges and schools of pharmacy (C/SOP) were invited to participate in a 1-year (1/1/2022 – 12/31/2022) prospective study characterizing responses to peer review invitations. Following IRB approval, site investigators assigned unique identifiers to participating faculty. Participants were asked to complete an electronic data collection form through REDCap® in real-time for each peer review invitation received, regardless of acceptance. Faculty completed a baseline and post-participation survey through REDCap® to collect demographics, perceived barriers, and reviewer incentives.

Results: A total of 83 faculty completed the baseline form. Faculty were primarily non-tenure track (75%) and in academia for a mean of 11 (±9) years. Among 806 peer review invitations received, the documented acceptance rate was 35%. Faculty received an average of 9.7 invitations (min=0, max=122). Non-pharmacy journals constituted 60% (578) of the invitations. The acceptance rate for pharmacy journal invitations was significantly higher compared to non-pharmacy journals (50% vs. 25%, p<0.01). Faculty who received 10 or more invitations had a significantly lower acceptance rate (30% vs. 53%, p<0.01). Twenty-four (29%) faculty reported ≤ 1 peer review invitation. Trainees were included on 16% of completed reviews. Lack of time and lack of invitations were the most common barriers reported. A primary incentive desired by faculty, but not frequently offered, was formal recognition of peer reviews by C/SOP.

Conclusion: There is significant variability in volume of peer review invitations among pharmacy practice faculty. Acceptance rates and inclusion of trainees are generally low. Formal emphasis on peer reviews by C/SOP may enhance future acceptance.

Emergency Medicine

Tues-46. Phenobarbital Administration in the Emergency Department for Alcohol Withdrawal Syndrome at a Community Teaching Hospital

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Introduction: Benzodiazepines (BZD) are considered standard of care for management in alcohol withdrawal syndrome (AWS); however, phenobarbital (PHB) has been shown to be safe and effective in the treatment of AWS, as well as reducing admissions to the intensive care unit (ICU).

Research Question or Hypothesis: The purpose of this study is to evaluate whether administration of PHB in the ED without continuation upon admission reduces overall hospital length of stay in AWS.

Study Design: Single-center, retrospective chart review from 2019 to 2021.

Methods: 200 patients at least 18 years old were included if they had a primary diagnosis of AWS and received either a dose of lorazepam or intravenous phenobarbital from the facility AWS order set. Patients were excluded if they were pregnant or discharged against medical advice. The first one hundred patients in each group that met inclusion criteria were included for analysis. The primary outcome assess was hospital length of stay with secondary outcomes assessing ICU length of stay, median CIWA scores, total BZD usage, and discharge disposition.

Results: There was a significant decrease in the length of stay of the 94 patients who received a PHB bolus compared to the 106 patients who did not get a bolus (one day versus 5 days; p<0.01). Median CIWA scores were lower for both day 1 (5.4 to 7 days; p=0.04) and day 2 (4.8 to 6.6; 9=0.04) in the PHB group. Hospital admissions were significantly less in the PHB group at 42% vs 74% requiring admission (p<0.01). When evaluating only LOS for admitted patients, the PHB group remained significantly less (5 days vs 6 days, p=0.04). There were no differences in the amount of safety events between the two groups.

Conclusion: A single bolus dose of phenobarbital in the ED was associated with decreased hospital LOS, hospital admissions, and early CIWA scores with no differences is safety endpoints.

Tues-44. Multimodal Solution to Assessing Emergency Department Pharmacists' Daily Activities

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Introduction: Emergency department (ED) pharmacists at Nebraska Medicine utilize the electronic medical record (EMR) to document emergency response activities and post-discharge follow-up care. Emergency response i-vents (ERI) are utilized for documentation of emergency bedside response. A standardized documentation tool is used to document post-discharge culture follow-up phone calls.

Research Question or Hypothesis: How much time are ED pharmacists spending at emergency response activations and documenting post-discharge patient care?

Study Design: This retrospective cohort study includes all ERI opened and all culture follow up calls documented by ED pharmacists from February 1, 2022 through August 31, 2022.

Methods: The primary outcome of this study is a composite of all emergency response and culture follow up calls the ED pharmacists are documenting and the time associated with each. Secondary outcomes include the number of culture follow-up calls documented, number of emergency response activations pharmacists documented as attending, and time spent on each. Descriptive statistics were utilized for data analysis.

Results: Results were separated between two campuses: Nebraska Medical Center (NMC) and Bellevue Medical Center (BMC). At NMC, ED pharmacists documented response to 2,238 emergencies, averaging 19.8 minutes/activation and documented 653 culture follow up calls averaging 10.15 minutes/call. This accounts for 210.2 minutes/day spent at the bedside during emergency activations and 33 minutes/day spent on post-discharge patient care. At BMC, ED pharmacists documented response to 133 emergencies averaging 21.2 minutes/activation and documented 323 culture follow up calls averaging 9.8 minutes/call. This accounts for 13.3 minutes/day spent at the bedside during emergency activations and 14.8 minutes/day spent on post-discharge patient care.

Conclusion: Emergency response and post-discharge culture follow up account for a significant portion of an ED pharmacists' daily activities. This study provides insight into the requirements of an ED pharmacist and may provide data to help justify staffing requirements.

Mon-69. The use of buprenorphine to-go packs in the emergency department

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Introduction: Buprenorphine is an effective treatment for opioid use disorder (OUD). Patients in the emergency department (ED) can be initiated/continued on buprenorphine as a bridge to follow-up and given a 'to-go' pack. These to-go packs were implemented in ten EDs within a health system.

Research Question or Hypothesis: What is the buprenorphine prescription fill rate and return to ED rate for patients 30 days post-discharge after implementation of a buprenorphine to-go pack program?

Study Design: Retrospective descriptive study (June 2022 to May 2023)

Methods: Adult patients discharged with a buprenorphine to-go pack from an ED within a major health system were included. Patients were excluded if they were admitted, transferred, incarcerated, or died in the ED. Data was extracted from the hospital electronic medical record, including patient demographics, clinical characteristics, and details of the ED visit. The primary outcomes assessed within 30 days of ED discharge were: (1) return to a health system ED, and (2) fill history of buprenorphine in the state prescription drug monitoring program database. Data was analyzed using descriptive statistics in Microsoft Excel (Redmond, WA).

Results: A total of 124 patients received buprenorphine to-go packs. The sample was primarily male (79; 63.7%), white (89; 71.8%), on Medicaid (79; 63.7%), and had a mean age of 40.9 years. A total of 43 patients (34.7%) were initiated on buprenorphine for the first time, while 81 (65.3%) had received buprenorphine in some form (prescription or to-go) previously. Of patients with data available at 30 days, 76/120 (63.3%) filled buprenorphine prescriptions and 38/116 (32.8%) returned to an ED within the health system for OUD withdrawal (15; 39.5%), non-OUD-related reasons (22; 57.9%), or overdose (1; 2.6%).

Conclusion: The implementation of a system-wide buprenorphine to-go supply at ED discharge is a feasible option to provide continuity of care to patients with OUD.

Tues-43. Evaluation of the Impact of Technology on Sepsis Bundle Compliance: A Focus on Blood Culture Collection and Antibiotic Administration

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Introduction: "The Severe Sepsis and Septic Shock Management Bundle" (SEP-1) is mandated for hospitals to report compliance with elements impacting sepsis patient morbidity and mortality. One of the core measures is obtaining blood cultures prior to antibiotics. A Best Practice Advisory (BPA) was built July 1, 2022 in the electronic health record to alert end-users during barcode medication administration of the antibiotic before the blood culture collection.

Research Question or Hypothesis: The primary outcome is to evaluate the impact of the BPA on compliance with collection of blood cultures prior to antibiotics portion of the SEP-1 measure.

Study Design: This is a single-center retrospective study evaluating the impact on compliance rates after the BPA implementation. Statistics for the primary outcome was chi-square and continuous data for baseline demographics with t-tests.

Methods: Data were collected through the electronic health record system. Patients were included if they were over the age of 18 years old, admitted to the hospital through the emergency department (ED).

The pre-BPA group included patients from August 1, 2021 to April 30, 2022 and the post-BPA groups included patients from August 1, 2022, to April 30, 2023. Patients were included if they had an order for blood cultures and intravenous antibiotics within 6 hours of arrival to the ED. Patient were excluded if they received oral antibiotics.

Results: The BPA improved order compliance from 90.4% (1556/1721) to 92.6% (1656/1788), p<0.019. There were 168 BPAs that were triggered and led to corrective action (blood culture prior to the antibiotic), which occurred with the BPA at 52% (89/168).

Conclusion: The use of best practice advisories at the point of use can modify behavioral outcomes and improve compliance for blood culture collection before antibiotics. There are several pieces of the SEP-1 measures and improving each individual component that may improve overall compliance.

Endocrinology

Sat-27. Lack of association between glucagon-like peptide-1 receptor agonists and depression

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Introduction: Glucagon-like peptide-1 receptor agonists (GLP-1 RA) are widely utilized for diabetes and weight loss. Previous literature has shown a possible association to GLP-1 RA use and neuropsychiatric conditions resulting in warnings contained in package labeling.

Research Question or Hypothesis: Is there an association between GLP-1 RA use and depression?

Study Design: Retrospective cohort study

Methods: Data was obtained from national administrative data from the VA Corporate Data Warehouse via the VA Informatics and Computing Infrastructure. Depression diagnosis and comorbidities were identified using ICD codes. Prescription information including medication counts were obtained from outpatient pharmacy data. The primary outcome was incident depression, defined as a new diagnosis of depression or antidepressant prescription within 1 year following index initiation of a GLP-1RA, SGLT-2i or DPP-4i. Multivariable log binomial regression was used to estimate the relative risk of incident depression between GLP-1RA and DPP-4i exposure, while adjusting for potential confounders. Multiple sensitivity analyses were performed including stratified analyses, analysis of a secondary outcome measure and use of an alternative comparator group.

Results: The primary outcome of incident depression diagnosis or antidepressant prescription occurred in 7.7% (n= 2,263) of patients who initiated a GLP-1RA and 6.3% (n= 6,602) of patients who initiated a DPP-4i. The corresponding unadjusted relative risk of 1.24 (95% CI: 1.18 – 1.29) indicated a significantly increased risk for incident depression following initiation of a GLP-1RA, relative to a DPP-4i. However, this relationship did not persist after adjustment for confounding factors including patient demographics, comorbid medical and psychiatric disorders, and prior medication exposure. After adjustment, the relative risk was 1.02 (95% CI: 0.97 – 1.07), thus failing to demonstrate a significant increase in risk for incident depression following GLP-1RA initiation, relative to a comparable therapeutic alternative.

Conclusion: This retrospective cohort study did not observe a significant increased risk for incident depression following GLP-1RA initiation.

Mon-73. Pharmacist-led interdisciplinary geriatric diabetes self-management education and support program

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Introduction: Diabetes Self-Management Education and Support (DSMES) programs provide evidence-based education to patients with diabetes and can improve HgbA1c and lower risks of diabetes-related complications. The HSC Health system piloted a pharmacist-led, interdisciplinary DSMES program in 2021, comprised of a pharmacist, nurse practitioner, dietician, physical therapists and social worker. The program now offers group classes quarterly and is accredited by the American Diabetes Association.

Research Question or Hypothesis: What is the feasibility of implementing an interdisciplinary DSMES program for geriatric patients with type 2 diabetes?

Study Design: Retrospective study reviewed by the HSC Institutional Review Board.

Methods: Feasibility was defined by:

1. The proportion of participants who completed at least two of the four sessions (goal retention rate of 75%).
2. The proportion of enrolled participants that completed the two-month follow-up assessment (goal completion rate of 50%).
3. The number of successful Medicare-reimbursed Diabetes Self-Management Training (DSMT) codes (goal reimbursement rate of 50%).

Clinical outcomes are presented in aggregate via descriptive statistics. Satisfaction scores and comments were obtained at the end of each cohort.

Results: Twenty participants successfully completed the pilot study across four cohorts. Eighty-five percent (17/20) of participants completed at least two of the four group sessions. Sixty percent (7/12) of eligible participants completed the individualized, 2-month follow-up assessment (6 participants have assessments scheduled at the end of June 2023). Average A1C reduction of 1% (0.2% to 5.2%) was achieved by participants. Medicare reimbursement rates were 76% and 85% for individual and group DSMT services, respectively.

Average participant satisfaction score of 4.7/5 with positive comments noted.

Conclusion: A consistent participation rate across cohorts supports the feasibility of implementing an interdisciplinary DSMES program within a geriatric population with type 2 diabetes. Medicare reimbursement for DSMT services was demonstrated for individual and group services.

Sat-26. Predictors of Clinical Success using Technology in Patients with Diabetes

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Introduction: Advancements in technology have opened doors for effective treatment of patients with diabetes. Literature shows that use of insulin pumps (IP) and continuous glucose monitors (CGMs) lead to improvements in glycemic control and hypoglycemic events as compared to multiple daily injections.

Research Question or Hypothesis: The primary objective was to determine factors associated with clinical success, defined as A1C goal attainment and Time in Range (TIR) for diabetic patients using IP systems. Secondary objectives were to determine factors significantly associated with lesser time in very high and very low glucose ranges.

Study Design: Retrospective, observational, cohort study.

Methods: Patients were identified from three primary care offices between the years of 2015 to 2021. Patients were analyzed from the most recent 12 months of IP utilization. Data was retrospectively extracted from charts and cloud-based manufacturer websites that housed IP and CGM data. Univariate analyses identified variables with statistical trend (P<0.1) for the primary and secondary outcomes. Variables demonstrating trend were integrated into backward stepwise multivariate regression analyses to create a final model of significant predictors using Minitab statistical software.

Results: Predictors of *A1C* goal attainment were found to be use of a closed-loop system (P=0.021) and greater time in automode/Control-IQ % (P=0.011). Predictors of *TIR* included lower baseline A1C (P=0.018) and commercial insurance coverage (P=0.031). Predictors of reduced time in *Very High CGM range* included baseline A1C (p<0.001) and longer use of IP (P=0.002). Predictors of reduced time in *Very Low CGM range* included greater time CGM worn (P=0.004) and Type 1 Diabetes (P=0.006).

Conclusion: In patients using IP, the use of closed loop system and greater percentage time in automode/Control-IQ were associated with greater A1C goal attainment. Lower baseline A1C and commercial insurance coverage was associated with improved *TIR*. Longer use of IP was associated with fewer high excursions and greater time wearing CGM with fewer low excursions.

Mon-71. Comparison of long-acting insulin conversion ratios for management of hyperglycemia in hospitalized patients

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Introduction: Insulin therapy is the foundation of inpatient management of diabetes mellitus regardless of usage in patients' home regimens. Basal insulin combined with mealtime insulin is a standard approach appropriate for most hospitalized patients. Although some patients may already be using a certain basal insulin product at home, the conversion to another product may be necessary once admitted to the hospital depending on formulary availability. Protocols between institutions and clinical settings lack standardization and there is currently minimal evidence suggesting the effectiveness and safety of standard conversion ratios between long-acting insulin products. This retrospective chart review aimed to investigate the dose conversion ratio of non-formulary insulin degludec to insulin glargine for inpatient diabetes management.

Research Question or Hypothesis: What is the effectiveness and safety of converting insulin degludec to insulin glargine in a 1:1 ration versus 1:1.2 ratio?

Study Design: A multicenter, non-interventional, retrospective cohort chart review was conducted over 3 years at UNC Health institutions in North Carolina, United States.

Methods: 1,037 patients were included to compare the incidence of hyperglycemic episodes when converting from insulin degludec to insulin glargine at a standard 1:1 ratio versus an alternative 1:1.2 ratio.

Results: Primary endpoint analysis showed that utilizing the alternative conversion ratio was associated with fewer patients with five or more episodes of non-severe hyperglycemia (blood glucose >180 mg/dL; p<0.0146). The alternative conversion ratio was also found to be associated with fewer episodes of severe hyperglycemia (blood glucose >200 mg/dL; p<0.0005), although it was not significantly associated with fewer patients with less than five episodes of hyperglycemia or hypoglycemia (blood glucose <70 mg/dL).

Conclusion: This observational study suggests the effectiveness of an alternative basal insulin conversion ratio with fewer hospitalized patients experiencing multiple episodes of hyperglycemia and no difference in the incidence of hypoglycemia despite more units of insulin administered.

Mon-72. Efficacy and cost effectiveness of calcitonin dose rounding in hypercalcemia

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Introduction: The cost burden of calcitonin, in particular the cost associated with waste generated from conventional weight-based

dosing (CWBD), emphasizes the need to optimize calcitonin dosing. Our five-hospital health-system adopted a standardized calcitonin weight rounded dosing scheme (WRDS) where patients receive a 200-, 300- or 400-unit dose limiting the dose to a maximum of one vial size. However, WRDS has led some patients to receive suboptimal doses of calcitonin.

Research Question or Hypothesis: We investigated if WRDS of calcitonin was an effective means to reduce serum calcium despite potentially under-dosing individuals and if there is a cost benefit associated with utilizing WRDS.

Study Design: Multicenter, retrospective chart review

Methods: This study included 160 patients who received calcitonin from July 1st, 2020, to December 15th, 2021. Laboratory values were obtained via chart review to determine initial corrected serum calcium (CSC) and a 12-hour CSC post administration of calcitonin. Usage of calcium lowering adjunctive treatments were collected including intravenous fluids and bisphosphonates. Purchasing data was recorded to determine calcitonin vial consumption. Data analysis was performed using R software and analyzed using two sample T-Test to assess for any statistically significant differences.

Results: Assessment of calcitonin administration utilizing WRDS showed no difference in average number of calcitonin doses administered during hospital stay compared to CWBD (3.02 vs 3.61, P= 0.86). The 12-hour CSC was similar when comparing WRDS to the CWBD (1.78 g/dL vs 1.72 g/dL, P = 0.62). During this time the health system purchased 74 less vials while utilizing WRDS resulting in >$100,000.00 waste reduction.

Conclusion: Weight based dose rounding scheme is an effective method of reducing CSC as compared to CWBD. Patient using WRDS did not seem to need additional doses of calcitonin to achieve a therapeutic response. These findings suggest that utilizing WRDS when administering calcitonin is clinically effective and cost-effective.

Gastroenterology

Tues-50. Effects of Medication Storage Lockers on Peer-Facilitated Telemedicine Hepatitis C Treatment Outcomes for Rural People who Use Drugs

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Introduction: Hepatitis C (HCV) treatment in people who use drugs (PWUD) is essential for achieving HCV elimination, yet, fewer than 10% are treated. Medication receipt and storage is a barrier for PWUD to complete HCV treatment, especially for houseless individuals.

Research Question or Hypothesis: Does establishing a medication locker protocol and sending HCV medications to a local syringe service program (SSP) for peer-facilitated support improve treatment initiation, completion, and cure rates?

Study Design: post-hoc subgroup analysis of randomized controlled trial

Methods: Between 2020 and 2022, PWUD with HCV in 5 rural Oregon counties were randomized to peer-facilitated telemedicine treatment (TeleHepC) versus referral to local providers. Participants randomized to TeleHepC, who completed a provider visit, and prescribed medication were included. A Medication Storage Protocol was created, and participants had medications sent to a private mailing address (non-SSP) or to a local SSP to be stored for peer-assisted initiation. The primary outcome was sustained virologic response 12 weeks post-treatment (SVR12). Statistical analysis included descriptive statistics and student t-test for comparisons.

Results: Of 100 participants randomized to TeleHepC, 88 were included in this post-hoc analysis. The sample was predominantly male (58%) and white (89%) with median age 41 (IQR 32-48). 63% of participants utilized medication lockers and participants with recent houselessness were more likely to do so (78% vs 41%; p<0.001). Comparing SSP to non-SSP, treatment initiation rates were the same (93%), treatment completion was lower (57% vs. 83%; p<0.05) and SVR12 was similar (71% vs. 72%; p>0.05).

Conclusion: The majority of houseless PWUD in rural communities elected to have HCV medications delivered to a local SSP and used a peer-assisted medication locker to facilitate treatment initiation and adherence. Despite a higher prevalence of houselessness, those who used medication lockers had similar treatment initiation and SVR rates as those who used traditional care models.

Geriatrics

Sat-33. Prevalence of Potentially Inappropriate Medications and Associated Geriatric Syndromes from a Health Information Exchange database in Western New York

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Introduction: Potentially inappropriate medications (PIMs) have been associated with geriatric syndromes (GS), although prevalence studies are lacking. Applying geographical Health Information Exchange (HIE) medication data to GS offers an innovative approach to identify problematic PIMs usage and target focused interventions.

Table - PIMs prevalence in Geriatric Syndromes

	Total Population	Delirium	Cognitive Impairment	Falls	Malnutrition	Urinary Incontinence	Depression
Antipsychotics	4.74%		22.15%*	10.25%*		8.31%*	14.67%*
Antidepressants	4.11%	5.61%*	4.92%*	5.90%*	6.07%*	6.64%*	
Benzodiazepines	12.58%	27.12%*	19.40%*	19.32%*			
Non-benzodiazepine Hypnotics	2.50%	3.45%‡	1.47%*	3.18%*			
Anticholinergics	14.63%	26.66%*	19.32%*	22.15%*		39.22%*	
Muscle Relaxants	5.45%	5.99%†	2.91%*	7.14%*		8.00%*	

* = p< 0.001‡ = p= 0.002
† = p= 0.20

Research Question or Hypothesis: To characterize cumulative polypharmacy, PIMs prevalence and Medications Associated with Geriatric Syndromes (MAGS) in the Western New York (WNY) older population.

Study Design: Cross-sectional study utilizing WNY HIE data from 1/1/2021 to 12/31/2021.

Methods: Data were extracted for adults ≥65 years old under primary care in 2021 from the WNY HIE using electronic health records, therefore representing providers' intended prescribing. Medication load included prescription and over-the-counter medications. ICD-10 codes identified GS. Using Minitab® v20.2, medication utilization and PIMs prevalence were tabulated, and associations between PIMs and GS were evaluated using Fisher's Exact Test.

Results: The dataset (N= 260,093) showed 139,310 between 65-74 years old, 83,337 between 75-84, and 37,446 above 85 with 53.92% female. Disease burden was high based upon Charlson comorbidity index mean 5.39 (SD 2.81). Mean medication load was 12.70 (SD 9.42). Cumulative polypharmacy (≥5 meds) was seen in 82.61%; hyperpolypharmacy (≥10 meds) was seen in 55.43% of the population.

Mean PIMs prevalence was high at 1.44 (SD 1.67). PIM categories previously described as MAGS were confirmed as noted in Table.

Conclusion: High polypharmacy and PIMs rates, especially those associated with geriatric syndromes, provide a target subset of individuals for future interventions to prevent medication associated harm.

Sat-32. Trends in hyperpolypharmacy and prescription expenditures among U.S. older adults, 2002-2017

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Introduction: Hyperpolypharmacy is common among older adults, posing risks of adverse events, impacting quality of life and leading to increased costs. Less evidence is available regarding nationally representative trends over extended time periods for hyperpolypharmacy and related changes in prescription expenditures.

Research Question or Hypothesis: We hypothesize that the prevalence of hyperpolypharmacy and total prescription expenditures increased over the study period.

Study Design: This was a serial cross-sectional study utilizing U.S. nationally representative data from the 2002 to 2017 Medical Expenditure Panel Survey (MEPS).

Methods: Respondents aged ≥65 years were identified within MEPS dataset from 2002 to 2017. Hyperpolypharmacy exposure defined as use of ≥10 medications. Outcomes included the trends in hyperpolypharmacy and prescriptions expenditures. Data was grouped and segmented into four-year intervals, starting from 2002, for comparative analyses. Total prescription expenditures were standardized to U.S. 2017 dollars using consumer price indices. Trends were examined utilizing chi-squared and linear regression tests. Prescription expenditures were compared with t-tests. Survey weighted procedures were used to generate U.S. population estimates (SAS Version 9.4).

Results: In our sample of ~643 million patients, 15.1% exhibited hyperpolypharmacy. There was no linear trend in prevalence in hyperpolypharmacy over the study period (p-trend=0.16). Comparing the years 2002-2005 to 2014-2017, the prevalence of hyperpolypharmacy increased from 13.6% to 15.4% (p=0.002). Subgroup analysis revealed higher prevalence in White men (12.2% vs. 15.3%, p=0.001) and Black men (8.4% vs. 13.3%, p=0.007) when comparing the timeframes. The prevalence in White & Black men aged 65-74 also increased significantly over the timeframe (11.6% vs.14.1%, p=0.02; 6.9% vs. 14.4% p=0.001, respectively). The mean total prescription expenditures significantly increased when comparing the timeframes (Difference: $226; 95% CI: $19 - $434; p=0.03).

Conclusion: Both hyperpolypharmacy and prescription expenditures increased over the study period. Efforts to promote rational geriatric prescribing may help reduce hyperpolypharamcy and total prescription expenditures.

Sun-69. Risk factors for hyperpolypharmacy among older adults in the United States

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Introduction: Hyperpolypharmacy is associated with a reduced quality of life and an increased likelihood of side effects. Understanding the factors that place an individual at risk of hyperpolypharmacy is important in designing interventions to address this issue.
Research Question or Hypothesis: What are the risk factors associated with hyperpolypharmacy among older U. S. adults?
Study Design: This is a cross-sectional analysis utilizing U.S. nationally representative data from 2002-2017 Medical Expenditure Panel Survey (MEPS).
Methods: Respondents aged ≥ 65 years were identified within MEPS from 2002-2017. Hyperpolypharmacy was defined as ≥ 10 medications. Potential risk factors collected in MEPS included sociodemographic, clinical, and quality-of-life factors. Survey-weighted logistic regression models were used to determine independent factors associated with hyperpolypharmacy, generating odds ratios and 95% confidence intervals (SAS version 9.4).
Results: Of the ~643 million patients, 15.07% (95% CI 14.61%-15.54%) exhibited hyperpolypharmacy with an average of 12.6 (SE 0.05) medications. Individuals aged 75-84 (compared to 65-74 years) were associated with higher odds of hyperpolypharmacy (aOR, 1.15; 95% CI 1.05-1.25); however, individuals above 85 had lower odds of hyperpolypharmacy (aOR, 0.69; 95%CI 0.60-0.80). Females had lower odds of hyperpolypharmacy (aOR, 0.77; 95%CI 0.70-0.84). Black and Asian race (compared to White) were associated with lower odds of hyperpolypharmacy (aOR, 0.66; 95% CI 0.59-0.74; aOR, 0.53; 95% CI 0.41-0.69, respectively). Fair/poor general health status ratings increased odds of hyperpolypharmacy greatly compared to excellent/very good/good ratings (aOR, 3.70; 95%CI 3.35-4.08). Instrumental daily activity limitations and a usual care source (vs. no source) were both associated with higher odds of hyperpolypharmacy (aOR, 1.68; 95% CI 1.46-1.94; aOR, 4.53; 95% CI 3.71-5.54, respectively).
Conclusion: Our results reveal several factors related to hyperpolypharmacy in the U.S. population with general health status and usual care source being more pronounced. Further work is necessary to investigate the causes of hyperpolypharmacy in these groups and develop interventions to address them.

Health Services Research

Tues-49. Relationship Between Health-Related Social Needs and Healthcare Utilization Following Hospitalization among Older Adults with COPD or Heart Failure

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Introduction: Chronic obstructive pulmonary disease (COPD) and heart failure (HF) are leading causes for hospital readmission. Health-related social needs (HRSNs) are increasingly recognized as contributing factors to readmissions and poor healthcare outcomes. HRSNs interventions are being implemented in various pharmacy settings, yet there is still no standardized approach for identifying patients with HRSNs or addressing them within the care continuum.
Research Question or Hypothesis: What is the relationship between HRSNs and healthcare utilization (HCU) following hospitalization among older adults with COPD or HF?
Study Design: Retrospective cohort study between January 2019 to December 2020 utilizing the Western New York health information exchange database.
Methods: Study eligibility included patients aged ≥65 years, COPD and/or HF diagnosis based on CMS readmission measures methodology, and an unplanned hospitalization. HRSNs were identified using diagnostic ICD-10-Z-codes (Z55–Z65 & 75) and were evaluated dichotomously as present or not. The three primary utilization outcomes at 30 days post-discharge included: (1) ED visits; (2) all-cause readmissions; and (3) combined HCU defined as having either (1) or (2). Multivariable logistic regression models were used to evaluate the relationship between HRSNs and utilization outcomes (SAS, version 9.4).
Results: There were 19,536 patients who met study eligibility. 784 (5%) were identified with at least one ICD-10-Z-code. Problems related to medical facilities and other health care (Z75) was most frequently documented. Adjusted models showed that HRSNs were associated with 42% (aOR, 1.42, 95% CI, 1.17-1.73, p=0.0004), 17% (aOR, 1.17, 95% CI, 0.97-1.40, p=0.097), and 20% (aOR, 1.2 95% CI, 1.02-1.41, p=0.03) increased odds for ED visits, all cause readmissions, and combined HCU 30 days post-discharge, respectively.
Conclusion: HRSNs are associated with increased odds for ED visits, readmissions, and combined HCU 30 days following hospitalization

among older adults with COPD or HF. Efforts to develop innovative team-based care transition interventions in collaboration with pharmacy are needed to address HRSNs.

Sun-70. Outcomes from a collaborative clinical pharmacist-community health worker service in a federally qualified health center serving adults experiencing homelessness

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Introduction: Health disparities and housing insecurity contribute to poor health outcomes in people experiencing homelessness (PEH). Clinical pharmacists operating under a collaborative practice agreement can improve health outcomes across outpatient settings. Community health workers (CHWs) can also help improve health outcomes.

Research Question or Hypothesis: What were the: (1) patient outcomes (*symptomatology*, *function*, *satisfaction*) and (2) implementation outcomes (*acceptability*, *adoption*, *appropriateness*, *costs*, *feasibility*, *fidelity*) from a new collaborative clinical pharmacist-CHW service implemented in a federally qualified health center (FQHC) serving PEH. **Study Design:** We carried out an evaluation of the new service.

Methods: Electronic health record data (e.g., blood pressure, social determinants of health) was collected from all patient participants ($n = 96$) to assess *symptomatology*; 15- to 30-minute semi-structured interviews were conducted with select patients ($n = 9$) to assess *symptomatology*, *function*, and *satisfaction*. Additionally, 15- to 30-minute semi-structured interviews were conducted with FQHC staff ($n = 11$) to assess implementation outcomes. Medicaid reimbursement rates for CHW services were calculated for *costs*.

Results: Reimbursement data indicated the CHW conducted 249 billable visits, at a rate of $9.70, totaling $2,415.30. Qualitative data revealed that most patients and staff were satisfied with the clinical pharmacist-CHW service. Contributors included the CHW's positive disposition, relatability, and rapport with patients; detractors included changes in the CHW's availability; clinical outcomes data are pending. Staff felt the service fit well into the FQHC, filled a gap in patient care, and appreciated the flexible and high-touch care. Identified areas of improvement included inconsistency in the CHW's schedule, a lack of clarity on the role of a CHW, and more structured coordination between the clinical pharmacist and the CHW. The FQHC hired the CHW into a full-time position.

Conclusion: Findings indicate the clinical pharmacist-CHW service positively impacted patients and revealed areas for improvement and Medicaid billing opportunities for CHW services in the FQHC.

Sun-71. Multiple Chronic Conditions are Associated with Increased Risk of Healthcare Super-Utilization

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Introduction: Multiple chronic conditions can complicate drug therapy, especially among older adults. Pharmacist interventions to optimize medication use can help to better manage chronic conditions. Understanding how chronic condition load (i.e., number of chronic conditions) can impact healthcare utilization is important in developing team-based interventions to address complications.

Research Question or Hypothesis: We hypothesize that a higher chronic condition load is associated with an increased risk of healthcare super-utilization.

Study Design: Retrospective cohort study between Jan. 2019 to Dec. 2021 utilizing data from the Western New York health information exchange.

Methods: Study eligibility included patients ≥65 years who experienced an unplanned hospital admission during the study period. Chronic conditions were defined based on the CMS Chronic Condition Warehouse. Primary outcome was healthcare super-utilization defined as ≥3 hospitalizations or ≥2 hospitalizations and ≥2 ED visits within 90 days of the post-index hospitalization. Secondary outcome was multiple transition of care (MTOC) defined as ≥2 healthcare events, including ED visit and hospital readmissions within 30 days of discharge. Logistic regression models were used to examine the relationship between chronic condition load and utilization outcomes (IBM SPSS, Version 28).

Results: There were 85,473 patients included in the study. The average number of chronic conditions was 4.1±3.3 and the most common were hypertension (68%) and cardiovascular disease (72%). Adjusted models showed that each additional chronic condition was associated with a 4% increased risk for super-utilization at 90 days post-discharge (aOR, 1.04; 95% CI 1.02, 1.07; p=0.001). There was no significant relationship between the number of chronic conditions and MTOC at 30 days post-discharge (aOR, 1.01; 95% CI 0.99, 1.02, p=0.52).

Conclusion: These results suggest that each additional chronic condition is associated with an increased risk for healthcare super-utilization at 90 days following hospitalization. Efforts to develop interventions in collaboration with pharmacy are needed to manage patients with multiple chronic conditions and reduce healthcare super-utilization.

Hematology/Anticoagulation

Mon-81. Evaluation of the Role of Apixaban and Rivaroxaban Calibrated Anti-Xa Level Monitoring and Clinical Implications

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Introduction: The ability to obtain a quantitative drug level for apixaban and rivaroxaban exists using drug-specific calibrated anti-Xa assays; however, no standard exists defining when to obtain direct oral anticoagulant (DOAC) concentrations or how to adjust medication regimens based on the results.

Research Question or Hypothesis: Describe the incidence of DOAC levels obtained, identify trends in prescribing DOAC levels in clinical practice, and qualitatively assess level appropriateness and actions taken based on level results.

Study Design: A qualitative, retrospective analysis was conducted using the electronic medical record to identify adult inpatients within a 10-hospital health system, from April 1, 2020, to November 1, 2022, with a calibrated apixaban or rivaroxaban anti-Xa level result.

Methods: The primary endpoint was the incidence of DOAC levels drawn as peaks. Secondary outcomes included the incidence of DOAC concentrations that prompted a dose change, association between dose or agent change and concentrations outside the on-therapy range, and association between indication for obtaining DOAC levels and resultant concentrations.

Results: One-hundred thirty-two calibrated anti-Xa levels were obtained in 101 inpatients during the study period, representing a level drawn in 0.48% of all apixaban and rivaroxaban orders. Eighty-three (63%) of patients were on apixaban. Only 42 (31.8%) of all levels were drawn appropriately as a peak. Seventeen (40.4%) of the peak levels were within the on-therapy range. Of the 25 levels outside the on-therapy range, 14 (56%) resulted in no change in therapy. For all levels drawn, 70 (53%) resulted in no change to therapy. Primary reasons to draw DOAC levels were extreme body weight (35%), treatment failure concerns (23%), bleeding concerns (18%), and drug interactions (14%).

Conclusion: DOAC concentrations are often drawn at inappropriate times and seldom influence a dose or agent change. Future research is needed to determine if DOAC concentrations may be clinically meaningful in a select subgroup of patients.

Sun-74. Use of Prophylactic or Therapeutic Anticoagulation in Critically Ill Patients with Pre-Existing Atrial Fibrillation

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Introduction: Critically ill patients with atrial fibrillation are at increased risk of both thromboembolism and bleeding. The optimal anticoagulant strategy in this population and its impact on outcomes is unknown.

Research Question or Hypothesis: Does therapeutic anticoagulation compared to pharmacologic venous thromboembolism (VTE) prophylaxis impact the prevalence of bleeding or thromboembolism in critically ill patients with pre-existing atrial fibrillation?

Study Design: Retrospective cohort study.

Methods: This study assessed adult patients in the medical or cardiac intensive care unit with pre-existing atrial fibrillation who received therapeutic anticoagulation versus VTE prophylaxis. Data extraction occurred via manual chart review. Patients were excluded if they had a non-atrial fibrillation anticoagulation indication, were hypercoagulable, thrombocytopenic, or admitted for bleeding or stroke. The primary outcome was international society of thrombosis and hemostasis defined major and clinically relevant non-major bleeding. Stroke rate was assessed between groups. Group characteristics and outcomes were presented using descriptive statistics with multivariable logistic regression used to adjust for relevant confounders. Alpha was set at < 0.05 and analyses were completed using SAS v9.4.

Results: A total of 199 patients were included, 100 received therapeutic anticoagulation and 99 VTE prophylaxis. Therapeutic anticoagulation mainly included patients receiving a heparin infusion (80%) and prophylactic anticoagulation mainly included subcutaneous heparin (87%). Those on therapeutic anticoagulation compared to VTE prophylaxis had a median (interquartile range) HAS-BLED score of 3 (3-4) versus 3 (2-4) (p=0.0013) and CHA_2DS_2VASc score of 4 (3-5) versus 4 (2-5) (p=0.5499); respectively. The risk of bleeding was increased in patients receiving therapeutic anticoagulation compared to VTE prophylaxis (19.0% vs. 7.2%; adjusted odds ratio 2.729 [95% CI 1.074-9.935]; p=0.0349). One stroke occurred in the entire cohort in a patient receiving therapeutic anticoagulation.

Conclusion: Use of therapeutic anticoagulation in critically ill patients with pre-existing atrial fibrillation may increase bleeding rates compared to pharmacologic VTE prophylaxis.

Mon-78. Retrospective comparison of low-dose versus standard-dose unfractionated heparin and low molecular weight heparin for venous thromboembolism prophylaxis in underweight hospitalized patients

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Introduction: Underweight hospitalized patients can have changes in standard pharmacokinetic principles, potentially increasing

hemorrhagic complications when standard thromboprophylactic doses of unfractionated heparin (UFH) or low molecular weight heparin (LMWH) are utilized. Limited evidence exists guiding clinicians on an optimal dosing strategy to prevent thrombosis in underweight patients while minimizing bleeding risk.

Research Question or Hypothesis: Compare the rates of venous thromboembolism (VTE) and major or clinically relevant non-major bleeding in underweight hospitalized patients on standard-dose UFH and LWMH versus low-dose.

Study Design: Retrospective, single-center, cohort study

Methods: Adult underweight (BMI < 18.5 or weight < 50 kilograms) patients from 2020-2022 receiving UFH or LMWH thromboprophylaxis for >/= 48 hours were included. Patients were excluded for CrCl < 30 mL/min, COVID-19 treatment, or admission for trauma, VTE, or major bleed. Low-dose thromboprophylaxis was defined as subcutaneous UFH < 15,000 units/day or LMWH < 40 milligrams/day. Patients were matched 1:1 to standard-dose thromboprophylaxis patients, defined as UFH 5,000 units TID or LMWH 40 mg daily. Descriptive statistics were performed via Stata/MP v17 followed by use of t-tests, Mann-Whitney U, Fisher's exact or Pearson chi-squared tests to compare appropriate data points. Statistical significance threshold was set at $\alpha<0.05$.

Results: 280 patients were included for analysis: 140 patients in each group. The low-dose group had a higher rate of previous VTE (p=0.036). Four VTE events occurred, 3 in the low-dose group and 1 in the standard-dose group($p = 0.622$). Five bleeding events occurred; 1 in the low-dose group and 4 in the standard-dose group ($p = 0.370$). Of the bleeding events, 3 were major bleeds in the standard-dose group.

Conclusion: The utilization of low-dose UFH and LMWH in underweight hospitalized patients resulted in lower rates of bleeding, but higher rates of thrombosis. Given the numerical differences in major bleeding, risks and benefits of an empiric low-dose thromboprophylaxis strategy should be carefully considered.

Mon-80. Enoxaparin versus heparin thromboprophylaxis in extremely obese patients: A retrospective cohort study

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Introduction: In extremely obese patients, there is limited data on the preferred thromboprophylactic agent (heparin vs. enoxaparin).

Research Question or Hypothesis: How effective and safe is enoxaparin thromboprophylaxis compared to heparin in extremely obese patients?

Study Design: A single-center retrospective cohort study

Methods: Adults with BMI≥50 kg/m^2 who received inpatient heparin or enoxaparin thromboprophylaxis between 01/27/2018 and 04/30/2022 were studied. Propensity score matching (PSM) was used to match patients in the two groups based on BMI, *Caprini Score* for VTE, and *Charlson Comorbidity Index*. The primary endpoints were VTE, major bleeding, and critical site bleeding (intracranial, intra-spinal, intraocular, pericardial, and retroperitoneal). The secondary endpoints were clinically relevant non-major bleeding, defined as acute or subacute clinically overt bleeding that did not meet the criteria for major bleeding and led to a prolonged hospital stay, and minor bleeding, defined as acute clinically overt bleeding that did not meet any other criteria. The *Fisher's exact test* compared the study endpoints. Statistical significance was defined by a 0.05 two-sided *p* value. For statistical test comparisons, IBM SPSS Statistics version 26 was used, and for PSM, Addinsoft's XLSTAT.

Results: 93 patients (55 enoxaparin, 38 heparin) met the inclusion criteria. 38 (69%) enoxaparin patients were matched with the 38 eligible heparin patients using the PSM. Thromboprophylaxis median (Q_1, Q_3) duration was 4 (3, 7) days with both anticoagulants [p=0.478]. 35 heparin patients (92%) received 5,000units BID and three (8%) TID. The daily enoxaparin dose was 40mg in 24 patients (63%), 60mg in three (8%), 80mg in 10 (26%), and 120mg in one (3%). No VTE, major, critical site, or clinically relevant non-major bleeding occurred. One minor bleeding was reported with heparin 5,000unit BID.

Conclusion: This study found no safety or efficacy differences between heparin and enoxaparin thromboprophylaxis in extremely obese patients. To confirm these findings, larger prospective studies with uniform dosing and longer durations are warranted.

Mon-79. Direct Oral Anticoagulants vs Warfarin for Treatment of Heparin-Induced Thrombocytopenia

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Introduction: Heparin-induced thrombocytopenia (HIT) is a prothrombotic disease state that requires initiation of a non-heparin containing anticoagulant for optimal management. Direct oral anticoagulants (DOACs) have become an increasingly popular option for treatment of HIT due to their relative operational ease. However, despite their inclusion in the 2018 American Society of Hematology HIT guidelines, there remains a lack of quality evidence to support their use with existing data based upon small sample sizes.

Research Question or Hypothesis: Are DOACs a safe alternative to warfarin in treatment of acute HIT?

Study Design: Multi-center, retrospective chart review

Methods: Adult patients with a laboratory confirmed or clinical diagnosis of HIT admitted between January 2019-August 2021 who

received a DOAC or warfarin were included in this study. The primary outcome was defined as the incidence of a major bleed within 30-days of initiation of therapy. Secondary outcomes included the development of a new thrombus or progression of thrombus and the incidence of minor bleeding.

Results: A total of 46 patients were included in the study. The incidence of major bleed was the same in both groups (1 patient per group). Two patients who received a DOAC developed a new thrombus or progression of thrombus and rates of minor bleeding were similar between the two groups. Patients in the DOAC group were more likely to have normal renal function while warfarin prescribing was more evenly distributed among renal function thresholds.

Conclusion: Major bleeding events were numerically similar between DOACs and warfarin, suggesting a favorable safety profile of DOACs for treatment of HIT. While a larger, prospective study would be ideal, the results of this study do contribute to current literature supporting the use of DOACs for HIT.

Herbal/Complementary Medicine

Sat-36. Patient-centered approach to evaluating the role of medical cannabis in the treatment of chronic pain

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Introduction: Chronic pain, which is often undertreated, has a profound negative impact on quality of life. The United States is suffering from an opioid epidemic, with disturbing trends in opioid misuse and overdose, emphasizing the need for additional treatments for chronic pain. Medical cannabis (MC) is an alternative non-opioid intervention for chronic pain, with much uncertainty regarding its place in therapy. Although some pain management guidelines recommend against use, MC has gained more attention with increased legalization in many states. The lack of consistent high-quality studies emphasizes the need for patient-centered outcomes research, engaging diverse patients in the research process to identify relevant research.

Research Question or Hypothesis: Participants have different experiences, perceptions, and beliefs that can be analyzed to develop patient-centered outcomes research regarding the utilization of MC for chronic pain.

Study Design: Qualitative, descriptive, focus-group study

Methods: Participants self-identified into three focus groups including individuals: with chronic pain who had used MC (group A), with chronic pain who had not used MC (group B), and without chronic pain regardless of use of MC for other conditions (group C). A facilitator questionnaire was developed addressing topics including efficacy, safety, cost, and convenience. Interviews were audio recorded, transcribed, and coded using NVivo 12 software. Thematic analysis using open and pattern coding was used to analyze responses.

Results: Twenty-eight individuals participated in this study with 8-10 participants per group. Along with the prespecified topics, additional themes were identified including MC dosing and formulations, safety in special populations, perceptions of provider interactions, the impact of bias, and employment ramifications of use. Themes were similar among groups, but areas of emphasis varied. A list of research questions was derived from identified themes.

Conclusion: The results of this focus group study provide avenues for patient-centered outcomes research on the use of MC for chronic pain.

HIV/AIDS

Sat-37. Review of the PEP to PrEP Transition in Sub-Saharan African National HIV Guidelines

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Introduction: Two thirds of people with HIV live in SubSaharan Africa (SSA). Post-exposure prophylaxis (PEP) is an underused HIV prevention strategy in SSA. There are well-described barriers to PEP usage at the individual, clinician, and system levels. One aspect of the system-level response is the publication of national HIV clinical guidelines to standardize clinical decision making for PEP and pre-exposure prophylaxis (PrEP).

Research Question or Hypothesis: Do national HIV guidelines for PEP reference PrEP for ongoing risk after non-occupational exposure and identify prior PEP usage as a consideration for PrEP eligibility?

Study Design: Systematic Review

Methods: National HIV guidelines in SSA countries published from 2012 were obtained from PrEPwatch.org database and database search using keywords of "National HIV Guidelines". We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist to determine the guidelines included in this study. Two researchers reviewed and recorded guideline elements using RedCAP.

Results: Twelve national guidelines were included. All guidelines recommended PEP treatment for non-occupational HIV exposure and acknowledged sexual violence to be an indication for the 28-day PEP therapy. Beyond the inclusion of sexual violence, eight out of twelve guidelines referenced sexual encounter as an indication, but none specified types of consensual sexual encounters where HIV risk may be higher. No guidelines mentioned considering PrEP following the completion of PEP for individuals with ongoing risk. Two out of twelve guidelines mentioned prior PEP usage as a consideration when determining PrEP eligibility.

Conclusion: Non-occupational PEP guidelines in SSA are oriented towards a solitary, nonrecurrent exposure, with rape as the most frequently cited indication. For PEP to be integrated as an HIV prevention strategy for non-occupational exposures, the clinical guidelines must reflect that eligibility for non-occupational PEP should lead clinicians to assess ongoing risk, and potential eligibility for PrEP, beyond a 28-day course of therapy.

Infectious Diseases

Sun-80. Evaluation of COVID-19 monoclonal antibodies and oral antiviral therapies in non-hospitalized patients at Cleveland Clinic Health System

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Introduction: During the COVID-19 pandemic, monoclonal antibodies (mAb) and oral antiviral agents represented two treatment options for mild-to-moderate COVID-19 in non-hospitalized patients at high risk of progression to severe infection. At Cleveland Clinic Health System (CCHS), high-risk criteria were created and antiviral therapy utilization was closely monitored.

Research Question or Hypothesis: What is the rate of hospitalization within 28 days of treatment with mAb or oral antivirals for high-risk, non-hospitalized patients with mild-to-moderate COVID-19?

Study Design: Retrospective, multi-center, cohort study

Methods: Adult patients prescribed molnupiravir, nirmatrelvir/ritonavir, or a COVID-19 mAb from 1/1/2022 to 12/31/2022 were included. Duplicative prescriptions were reviewed and patients receiving multiple therapies were excluded. Only the first instance of outpatient COVID-19 treatment per patient was included. Using Stata software v16.1, descriptive statistics evaluated categorical variables as frequency with proportion and continuous variables as mean with standard deviation or median with interquartile range. Normality was determined by a significant Shapiro-Wilk's test.

Results: A total of 25,657 patients were included. An average patient was a 65 year old, White (87%), non-Hispanic (95%) female (58%). Some pre-existing conditions included vascular disease (11.5%), hypertension (8.5%), neoplasm (6.6%), and transplanted organ or tissue (0.72%). More patients received oral nirmatrelvir/ritonavir (70.8%) and molnupiravir (18.9%) compared to bebtelovimab (7.2%) and sotrovimab (3%). Primary outcome showed 1.9% hospitalization within 28 days of therapy (n=487 of 25,657). Nirmatrelvir/ritonavir (0.8%) had the highest hospitalization rate, followed by molnupiravir (0.5%), bebtelovimab (0.38%) and sotrovimab (0.1%). Among hospitalized patients, 104 of 487 patients (21%) required intensive care unit visit within 28 days of therapy.

Conclusion: Hospitalization within 28 days remained low after receiving mAb or oral antivirals in high-risk non-hospitalized patients with mild-to-moderate COVID-19. Further studies are needed to determine risk factors for hospitalization especially in special patient populations.

Tues-71. Pharmacists' Sentiment Regarding the Coronavirus Disease 2019 (COVID-19) Test to Treat Initiative and Perceived Barriers to Implementation

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Introduction: In March 2022, the US FDA launched the Test to Treat (TTT) initiative, through which pharmacists can test individuals for COVID-19, prescribe oral COVID-19 antiviral therapeutics, and fill prescriptions.

Research Question or Hypothesis: What were pharmacists' perceptions of the TTT initiative and perceived barriers to its implementation?

Study Design: A 10-question survey was completed by Gilead medical science liaisons (MSLs) following visits wherein pharmacists were asked their opinion regarding the TTT initiative.

Methods: Survey questions were captured via SurveyMonkey® immediately following MSL visits from July 27, 2022 to Oct 10, 2022. Responses to all survey questions were optional. Questions focused on pharmacists' geographical location, institution type, attitude toward the TTT announcement, and perceived barriers to implementation. Additional feedback was solicited using an open-ended question.

Results: A total of 55 responses were received across all areas of pharmacy practice (51.1% community; 42.2% hospital; and 2.2% each for academic hospitals, long-term care, and managed care, respectively). In all, 14/55 (25.5%) respondents indicated their institution planned to allow pharmacists to prescribe COVID-19 antivirals, 34/55 (61.8%) indicated their institution had no such plans, and 7/55 (12.7%) did not respond to the question. Most (31/55 [56.4%]) responses reflected positive sentiments regarding the initiative. An emergent theme was the potential for TTT strategies to improve patient access, particularly in underserved communities. Demands on workload, the potential lack of patient medical histories, the need for adequate staffing, and a lack of reimbursement and/or diagnostic materials were cited as perceived barriers. Respondents indicated some barriers might be removed if antivirals had clear dosing, minimal

drug interactions, and were safe and easy to administer, monitor, and follow-up on.

Conclusion: For pharmacists to fully implement the COVID-19 TTT initiative, certain infrastructure barriers must be addressed. Overall, respondents were optimistic about the initiative, specifically its potential to increase access for underserved communities.

Mon-86. Impact of an Outpatient Fluoroquinolone Order Set on Prescribing Rates and Usage at a Veterans Affairs Facility

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Introduction: Fluoroquinolones are frequently used due to their favorable administration frequency, high bioavailability, and broad spectrum of activity. However, fluoroquinolones are associated with numerous serious adverse events including tendinitis and *Clostridioides difficile* infection. To optimize fluoroquinolone prescribing, our facility implemented an outpatient order set.

Research Question or Hypothesis: We hypothesize a decrease in outpatient fluoroquinolone prescriptions may be observed after implementation of an order set.

Study Design: Retrospective, quasi-experimental analysis

Methods: We conducted an analysis of patients prescribed oral fluoroquinolones three months before and three months after implementation of an outpatient fluoroquinolone order set on August 15th, 2022. Outpatient fluoroquinolone ordering was restricted to the evidence-based order set. The primary outcome of this study is frequency of fluoroquinolone prescribing. The secondary efficacy outcomes are average day supply of fluoroquinolones and rate of inappropriate fluoroquinolone prescribing. The safety endpoints analyzed include recurrence of infection indicated by use of antibiotics within thirty days for same indication and fluoroquinolone-related adverse events.

Results: Frequency of fluoroquinolone prescribing decreased by 27.45% after order set implementation, with 255 prescriptions in the pre-intervention cohort and 185 prescriptions in the post-intervention cohort. Inappropriate fluoroquinolone prescribing decreased by 38.52%. Kappa inter-rater reliability score between chart reviewers for inappropriateness was 0.73. Average day supply remained unchanged between groups.

Recurrence of infection was similar between pre-intervention and post-intervention groups. Incidence of abdominal aortic aneurysm or aortic dissection, tendinitis, and *C. difficile* infection remained similar between both cohorts (<1% for each cohort).

Conclusion: Frequency and inappropriateness of prescribing of this antibiotic class decreased at our Veterans Affairs healthcare system following implementation of the outpatient fluoroquinolone order set. A high kappa inter-rater reliability amongst chart reviewers supports consistency of determining the secondary outcome of inappropriate prescribing.

Implementation of the outpatient fluoroquinolone order set did not lead to a clinically significant change in recurrence of infection or incidence of major fluoroquinolone adverse effects.

Tues-68. Antibiotic Inertia and the Impact on Patients with Community-Acquired Pneumonia

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Introduction: Antibiotic inertia has been defined as the tendency of inpatient providers to continue antibiotics chosen in the Emergency Department (ED) regardless of appropriateness. Patients presenting with community-acquired pneumonia (CAP) may frequently meet sepsis criteria, and current sepsis guideline recommendations may contribute to early broad antibiotic selection.

Research Question or Hypothesis: Do patients with CAP started on broad spectrum antibiotics by the ED provider (EDP) experience more antibiotic inertia when compared to patients initially started on narrow therapy?

Study Design: Retrospective chart review of adults admitted to Methodist University Hospital in Memphis, TN for initial treatment of CAP between January 1, 2020 and July 1, 2022, who were started on antibiotics by an EDP.

Methods: Broad antibiotic coverage was defined as antibiotics covering MRSA or *Pseudomonas*. Patients were excluded if no antibiotics were started by the EDP, immediate admission to the ICU, multiple indications for antibiotics, or positive for COVID during the visit.

Results: Of the 111 patients included, 75 were in the ED narrow therapy group (67.6%) and 36 in the broad therapy group (32.4%). Overall, 54% of patients met sepsis criteria on presentation. The rate of antibiotic inertia was significantly higher in the narrow therapy group (52% vs. 16.7%; p<0.001). The narrow therapy group was more likely to be on appropriate inpatient antibiotics (65.7% vs. 32.4%; p<0.001). Patients started on broad therapy in the ED had longer durations of antibiotics (9.6 days vs. 6.6 days; p<0.001). Use of a "sepsis bundle" order-set was associated with a higher rate of broad therapy (32% vs. 63.9%, p<0.001).

Conclusion: There was an increased rate of antibiotic inertia in patients that received narrow therapy from an EDP. Most patients started on narrow therapy were receiving guideline-based therapy for CAP. Initiation of broad therapy antibiotics in the ED was associated with longer durations of therapy.

Sat-38. Rapid onset and recovery of linezolid-induced thrombocytopenia: A large-sample, single-center, retrospective cohort study

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Introduction: Thrombocytopenia is a common and potentially severe adverse effect of linezolid, but the time to onset during treatment has varied substantially across studies. Moreover, the time to recovery after linezolid withdrawal has not been examined in a larger patient sample.

Research Question or Hypothesis:

1. May linezolid induce thrombocytopenia before two weeks?
2. When may recovery occur after linezolid discontinuation?

Study Design: Retrospective observational cohort study.

Methods: A retrospective observational cohort study was conducted between January 2017 and December 2022 at Dammam Medical Complex using the medical records of hospitalized adults with normal baseline platelet counts receiving intravenous linezolid for a minimum of 48 hours. All patients included in the analyses received daily platelet count monitoring for up to 14 days after linezolid initiation and 14 days after discontinuation. Thrombocytopenia was defined as a drop in platelet count to $<150 \times 10^9$/L or <50% of baseline within 14 days. The treatment duration–risk relationship and recovery rate were analyzed by constructing Kaplan–Meier survival curves.

Results: In total, 334 patients met study inclusion criteria. The mean time to develop thrombocytopenia after starting linezolid was five days, and the mean time of recovery was also 5 days. The cumulative risk of thrombocytopenia reached 100% by day six of therapy, and cumulative recovery reached 100% by day six after linezolid withdrawal, with half of the study population recovering by day four.

Conclusion: Thrombocytopenia can develop rapidly during linezolid treatment, but recovery after discontinuation is also rapid. Rapid thrombocytopenia is a common adverse effect of linezolid that must be considered prior to prescribing.

Sun-81. Slowing the Beat: Evaluation of Remdesivir-Associated Bradycardia

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Introduction: Bradycardia (heart rate (HR) <60bpm) was not initially described as an adverse effect associated with remdesivir but has been reported after its approval. Data regarding remdesivir-associated bradycardia is limited and conflicting.

Research Question or Hypothesis: Is remdesivir associated with heart rate (HR) reduction and/or bradycardia?

Study Design: Single-center, retrospective cohort study between 5/1/2020-12/1/2021.

Methods: Hospitalized patients eligible for inclusion were ≥18 years old and received >24 hours of remdesivir. Patients were excluded if HR<60 or >110 beats per minute (bpm) within 24 hours of starting remdesivir or received a bradycardia-associated medication that was not a home/chronic medication within 24 hours or up to 5 days after starting remdesivir. The primary outcome was the difference in median HR pre- and post-remdesivir. Secondary outcomes included number of episodes of bradycardia post-remdesivir, nadir HR, and interventions to manage bradycardia (atropine administration, pacing, and/or transfer to intensive care unit). The Wilcoxon signed-rank test was used for continuous data. Variables to assess post-remdesivir bradycardia were considered in the multivariate logistic regression if they had a p<0.1 on univariate analysis.

Results: Among 514 unique patient encounters, 328 were included. Most patients were male (53.4%), had severe COVID-19 (59.8%), and median (IQR) age was 62 (23.7) years. Median (IQR) remdesivir duration was 4.9 (1.5) days. Median (IQR) HR (bpm) was significantly lower post-remdesivir compared to pre-remdesivir (74 (15) versus 87 (19), p<0.001). Among 48.8% of patients with bradycardia post-remdesivir, median (IQR) nadir HR (bpm) was 53 (6.8). No patients required an intervention for remdesivir-associated bradycardia. In multivariate logistic regression, remdesivir duration (OR 1.26(95% CI 1.04-1.54), p=0.019) and median pre-remdesivir HR (OR 0.96(95% CI 0.94-0.97), p<0.001) were identified as significant predictors for post-remdesivir bradycardia.

Conclusion: A statistically significant reduction in median HR post-remdesivir was observed with several patients experiencing bradycardia; however, none required intervention. Longer remdesivir durations and lower pre-remdesivir HR were predictors of post-remdesivir bradycardia.

Tues-60. Clinical outcomes of a pharmacist-managed aminoglycoside protocol: a pre- and post-intervention study

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Introduction: Aminoglycoside antibiotics have a narrow therapeutic index, and medication-use evaluation at our institution revealed errors

in their use. Therefore, a pharmacist-managed protocol was established for dosing and monitoring.

Research Question or Hypothesis: Will a pharmacist-managed aminoglycoside protocol improve bacteriologic cure, maintain levels within range, and reduce acute kidney injury (AKI)?

Study Design: A single-center pre- and post-intervention study

Methods: The study included all patients who received intravenous amikacin or gentamicin for >24 hours in the year before protocol implementation and ended when the same number of eligible patients was reached after protocol. The pre-intervention period was April 1, 2016, to April 2, 2017, and the post-intervention period was April 3, 2017, to January 13, 2018. Pregnant and under-14 patients were excluded because medical staff managed them. The primary endpoint was bacteriologic cure, measured by negative cultures after aminoglycosides. The rate of AKI according to the Acute Kidney Injury Network criteria, the number of patients achieving therapeutic levels, and the appropriateness of monitoring, defined by serum aminoglycoside levels after initiation and SrCr within a week before and 48 hours after initiation, were secondary endpoints. The Chi-square test compared nominal frequencies (percentages). The t-test compared SD-presented continuous, normally distributed means. For nonparametric frequencies, Mann-Whitney U test was used. A two-sided p value of 0.05 was used to define statistical significance, and for statistical test comparisons, IBM SPSS Statistics software version 26 was used.

Results: The study included 102 patients (51 per phase). Bacteriologic cure occurred in 25 patients (49%) before intervention and 37 (73%) after [p=0.015]. Five patients (9.8%) had AKI before and four (7.8%) after [p=0.727]. Twelve patients (23%) achieved therapeutic aminoglycoside serum levels before and 30 (58%) after [p<0.001]. Thirty-three patients (64%) were not appropriately monitored before and 7 (13%) after [p<0.001].

Conclusion: In this study, a pharmacist-managed aminoglycoside protocol improved bacteriologic cure and maintained aminoglycoside levels within range.

Tues-50. Head-to-head comparison of multi-dose oritavancin and dalbavancin for complicated infections: a propensity score-matched analysis

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Introduction: Oritavancin and dalbavancin are long-acting lipoglycopeptide antibiotics that have recently gained traction for weekly use in outpatient antimicrobial therapy (OPAT) for complicated infections. Currently, no head-to-head studies exist for this purpose.

Research Question or Hypothesis: Are there differences in clinical outcomes in patients receiving multiple doses of oritavancin or dalbavancin for complicated infections?

Study Design: Single-center, retrospective, propensity-matched cohort study

Methods: Adult patients receiving treatment with multiple doses of lipoglycopeptides for complicated infections from February 2019 through December 2022 were eligible for inclusion. Patients receiving oritavancin were compared to dalbavancin after propensity score matching based on baseline characteristics, hospital admission prior to therapy initiation, infection type, and lipoglycopeptide regimen characteristics. The primary endpoint was clinical success at 90 days. Additional endpoints assessed included: 30-day (re-)admission, 30-day mortality, frequency of adverse drug reactions (ADRs), and changes in white blood cells (WBC) and inflammatory markers.

Results: 700 encounters were initially screened. After exclusions and propensity score-matching, a total of 131 matched pairs (N=262) were included in the analysis. Baseline characteristics were well-balanced and approximately half of the matched subjects were receiving treatment for the indication of osteomyelitis. There was no significant difference in clinical success at 90 days in the oritavancin and dalbavancin cohorts (99 [76%] vs 103 [79%], respectively; p=0.556). Similarly, there was no difference in (re-)admission or mortality, as well as change in laboratory values after initial dosing. There were significantly more unique patients who experienced an ADR in the oritavancin cohort compared to the dalbavancin cohort (9 [7%] vs 2 [2%], respectively; p=0.031).

Conclusion: There was no significant difference in clinical success between patients receiving multi-dose oritavancin and dalbavancin for OPAT for complicated infections. Both agents were generally well tolerated; however, more unique patients experienced an ADR in the oritavancin cohort.

Tues-83. Secondary Analysis of Quality of Life Among Patients in the Phase 3 ECOSPOR III Study of Fecal Microbiota Spores, Live-brpk (VOWST™; formerly SER-109; now VOS for Vowst Oral Spores) in Recurrent *Clostridioides difficile* Infection

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Introduction: Fecal microbiota spores, live-brpk (VOWST™; formerly SER-109; now VOS for Vowst Oral Spores), an oral microbiota-based therapeutic comprised of Firmicutes spores, was well tolerated/significantly reduced risk of *Clostridioides difficile* infection (CDI) recurrence vs placebo through 8 weeks in ECOSPOR III (NCT03183128).

Research Question or Hypothesis: What impact did VOS have on health-related quality of life (HRQoL) of patients with recurrent CDI in ECOSPOR III?

Study Design: Secondary analysis of a randomized, controlled trial.

Methods: HRQoL of patients receiving VOS or matched placebo was evaluated using the *Clostridioides difficile* Quality of Life Survey (Cdiff32). Patients completed the Cdiff32 at baseline, Week 1, and Week 8 visits (or at recurrence/early termination visit). At Weeks 1 and 8, Mantel-Haenszel χ^2 test was used to determine differences in treatment groups in ranked ordinal outcomes and ANCOVA was used to determine differences in groups from baseline.

Results: This exploratory analysis included 182 (VOS, n=89; placebo, n=93) patients from the primary analysis of ECOSPOR III. Baseline total and individual domain Cdiff32 scores were similarly low between groups. At Week 1, proportions of patients with improvement in Cdiff32 total score was higher in the VOS vs placebo (49.4% vs 26.9%; P=0.012) groups; this proportion was also significantly higher at Week 8 (66.3% vs 48.4%; P=0.001). Greater improvements were seen in total, physical domain, and subdomain scores in the VOS group (vs placebo) at Week 1; continued improvements were seen at Week 8. Cdiff32 scores were significantly higher in patients without vs with on-study CDI recurrence (least-squares mean treatment difference [95% CI] for total: −17.1 [−23.1 to −11.2]; P<0.001). Patients receiving VOS had improvements in total and individual domain Cdiff32 scores, regardless of on-study CDI recurrence through Week 8.

Conclusion: Through 8 weeks, VOS was associated with rapid improvement in quality of life, regardless of clinical outcome.

Tues-73. An Integrated Safety and Efficacy Analysis of Phase 3 ECOSPOR III and ECOSPOR IV Studies of Fecal Microbiota Spores, live-brpk (Vowst TM; VOS; formerly SER-109) in Recurrent *Clostridioides difficile* Infection

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Introduction: Antibiotics are often insufficient to treat recurrent *Clostridioides difficile* Infection (rCDI) because they have no effect on *C. difficile* spores, which germinate in a disrupted microbiome. Fecal microbiota spores, live-brpk (VOWST™; formerly SER-109; now VOS for Vowst Oral Spores) is an oral microbiota-based therapeutic designed to prevent rCDI in adults with a history of rCDI.

Research Question or Hypothesis: What is the overall safety/efficacy evidence for VOS?

Study Design: Integrated safety/efficacy analysis of ECOSPOR III (randomized, placebo-controlled) and ECOSPOR IV (open-label, single-arm).

Methods: ECOSPOR III enrolled 182 patients with history of ≥2 CDI recurrences; ECOSPOR IV enrolled 263 patients with rCDI. VOS was administered orally as 4 capsules over 3 consecutive days following antibiotic treatment. Treatment-emergent adverse events (TEAEs) were collected up to Week 8 following VOS therapy; serious TEAEs/adverse events of special interest were collected through Week 24. Efficacy endpoints were rCDI (toxin-positive diarrhea requiring treatment) through Week 8 and Week 24.

Results: In ECOSPOR III and ECOSPOR IV, 349 patients received at least 1 dose of VOS. Through Week 24, 221 (63.3%) patients experienced TEAEs, which were mostly mild to moderate and gastrointestinal in nature. The most common treatment-related TEAEs were flatulence, abdominal distension, abdominal pain, fatigue, and diarrhea. No study withdrawals were due to treatment-related TEAEs. No serious TEAEs or deaths were considered related to VOS by investigators. Among the 349 patients receiving VOS, 33 (9.5%; 95% CI, 6.6–13.0) and 53 (15.2%; 95% CI, 11.6–19.4) experienced on-study recurrence up to Week 8 and through Week 24, respectively. At Weeks 8 and 24, 90.5% (95% CI, 87.0–93.4) and 84.8% (95% CI, 80.6–88.4) of patients, respectively, were recurrence free.

Conclusion: This integrated analysis confirms VOS was well tolerated and rates of recurrence were low, supporting a role for microbiome restoration in prevention of rCDI.

Sun-78. Evaluation of Antibiotic Duration at Discharge for Community-Acquired Pneumonia

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Introduction: Optimizing the duration of antibiotic therapy at hospital discharge is an important community-acquired pneumonia (CAP) stewardship intervention, as prolonged courses contribute to resistance and harm. Current guidelines recommend five days of therapy in patients with clinical resolution of symptoms.

Research Question or Hypothesis: The purpose of this medication use evaluation was to determine the appropriateness of CAP antibiotic duration.

Study Design: This was an Institutional Review Board-exempt, retrospective chart review conducted at a community teaching hospital between July 1 and December 31, 2022.

Methods: Patients were included if they were at least 18 years old and had a CAP diagnosis. Patients were excluded if they had a concomitant infection, intensive care unit admission, or sepsis diagnosis. Electronic medical records and online medication history data were reviewed. The primary outcomes were to assess total antibiotic duration and duration at discharge. The number of days of inpatient and discharge antibiotics was collected and compared to clinical practice guidelines. Secondary outcomes were to describe discharge antibiotic regimens, quantify medication errors, and assess 30-day readmissions

for pneumonia and *Clostridioides difficile (C. diff)*. Descriptive statistics were used.

Results: A total of 321 hospital admissions were assessed, and 50 met inclusion criteria. The average length of hospital stay was 4.27 days. The average total duration of antibiotic therapy was 8.53 days, while the average duration of discharge antibiotic therapy was 4.89 days. Discharge regimens most commonly included doxycycline (20%) and amoxicillin-clavulanate (18%). A total of 31 errors were detected in discharge antibiotics; most were due to excessive treatment duration. Two patients were readmitted for pneumonia within 30 days, and none developed *C. diff*.

Conclusion: Similar to previous findings demonstrating antibiotic overuse at hospital discharge, many patients received a prolonged course of therapy. The opportunity to optimize discharge antibiotic prescribing for CAP exists.

Tues-62. Deciphering the Effects of Atypical Antipsychotics on Gut Resistome Dynamics

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Introduction: As our understanding of the reciprocal interaction between pharmaceuticals and the gut microbiome deepens, the potential consequences for antimicrobial resistance (AMR) in intestinal bacteria have increasingly become a point of interest. Quetiapine, a commonly prescribed second-generation antipsychotic (SGA) drug, has been implicated in this context. Our prior research has shown that quetiapine contributes to AMR *in vitro*; however, the impact of this interaction are unclear. In this study, we aimed to understand the impact of quetiapine on the gut resistome of mice.

Research Question or Hypothesis: We hypothesize that long-term exposure of gut bacteria to quetiapine will select for genetic adaptations that are shared with AMR mechanisms.

Study Design: Longitudinal, parallel-controlled, repeated measures animal intervention study with quetiapine

Methods: Male and female adult mice were exposed to quetiapine (10 mg/kg/day) via drinking water over a 12-week period. The fecal resistome was assessed longitudinally and compared to a parallel control group that received regular drinking water. We utilized a hybrid capture approach to survey longitudinal dynamics of AMR genes and gene variants. We evaluated the minimal inhibitory concentrations (MICs) of *Escherichia coli* isolates cultured from mouse stool to assess changes in antibiotic susceptibility.

Results: We found that quetiapine exposure increased the relative abundance of AMR gene families related to antibiotic efflux (Qvalue = 0.03) , the phosphoethanolamine transferases (Qvalue = 0.05), and undecaprenyl pyrophosphate-related proteins (Qvalue = 0.05) in the fecal resistome. Consistent with these findings, *E. coli* cultured from quetiapine-exposed mice displayed a significant decrease in colistin sensitivity when compared to *E. coli* cultured from control mice (Wilcoxon = 0.02).

Conclusion: This study provides the first evidence that quetiapine could contribute to AMR development in complex microbial communities *in vivo*. These findings underline the importance of further research into the effects of psychiatric medication on the gut resistome to inform more effective clinical practice and antimicrobial stewardship.

Mon-83. Adherence rates in a pharmacist-led hepatitis C clinic for patients on methadone maintenance therapy

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Introduction: In 2020, it was estimated that more than 2 million people in the United States had chronic hepatitis C (HCV), with the most common mode of transmission being injection drug use. Our pharmacist-led service for HCV was established at a methadone clinic to support a high risk population. Data is limited in patients who have incomplete adherence to direct-acting antivirals (DAAs) for chronic HCV.

Research Question or Hypothesis: We sought to determine adherence rates to HCV DAAs in a pharmacist-led clinic in patients on methadone maintenance therapy.

Study Design: Single center, retrospective chart review

Methods: Patients enrolled in the clinic during the study period who were greater than or equal to 18 years old with a HCV viral load obtained 12 weeks post-treatment were included. Data on baseline characteristics, substance use disorder history and current use, regimen, adherence rates, adverse effects and pharmacist interventions were collected. The primary objective was to characterize adherence rates. The secondary objective was to determine sustained viral response rates at 12 weeks post-treatment (SVR12).

Results: A total of 57 patients met the inclusion criteria with 33% (n=19) reporting incomplete adherence at any follow-up visit. Of the nineteen patients with adherence concerns, 15.8 % (n=3) took doses late, 63.2% (n=12) missed fewer than 7 days, and 21.1% (n=4) missed 7 to 28 days of therapy. SVR12 was achieved in 91.2 % (n=52) of patients. Two patients with a viral load at 12 weeks achieved SVR at 24 weeks (SVR24) without further intervention. Of the remaining three patients, all reported a mild adverse effect from treatment and one patient reported incomplete adherence and missed fewer than 7 days of therapy.

Conclusion: Although one-third of patients reported incomplete adherence to DAAs, treatment success was above 90%. Pharmacists can counsel and support patients throughout their HCV treatment course to ensure continued adherence and treatment success.

Medication Safety

Sun-86. The risk of hemolytic anemia in G6PD deficient patients treated with hydroxychloroquine and nitrofurantoin: Insights into the United Arab Emirates.

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Introduction: Glucose-6-phosphate dehydrogenase deficiency (G6PDD) is one of the most common enzyme deficiencies. The resulting hemolytic anemia is largely triggered by certain medications. Although routine testing for G6PDD prior to initiation of hydroxychloroquine (HCQ) is not endorsed by clinical guidelines, careful use in patients with G6PDD is recommended on the package insert.

Research Question or Hypothesis: We sought to quantify the frequency of G6PD deficient patients at Cleveland Clinic Abu Dhabi (CCAD), as well as to quantify the frequency of G6PD-deficient patients with hemolysis attributed to HCQ use in a sample of an Emirati population.

Study Design: A retrospective observational chart review was performed at our quaternary care hospital.

Methods: We performed a retrospective chart review to identify all eligible patients who were screened for G6PDD, and who were prescribed either HCQ or nitrofurantoin between 2015 and 2020. Case records were analyzed for G6PDD, HCQ and nitrofurantoin use, length of exposure to the drugs, demographic characteristics, and laboratory evidence of hemolysis.

Results: Out of 2986 patients who were tested for G6PD level, 512 (17.14%) were G6PDD. A total of 450 patients were excluded and 61 G6PDD patients, with either HCQ or nitrofurantoin prescriptions, were analyzed. Of those, none showed evidence of hemolysis due to drug exposure.

Conclusion: Considering the paucity of available research studies from the region, the present study represents the first to look at the use of HCQ and nitrofurantoin in a G6PDD cohort. Our results highlight a potential absence of a causality between the hemolysis phenotype in a G6PDD patient and both HCQ and nitrofurantoin use. Which suggest the possibility of no necessary routine testing for G6PDD before initiating either medication. Larger investigations, as well as studying the role of genotypes and specific variants contribution to hemolytic risks, especially after HCQ administration, are also warranted.

Sun-84. Understanding seizure medication impact on patient safety, is greater cardiac monitoring needed?

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Introduction: Seizure medications used in the treatment of seizures and bipolar disorder can have cardiac risks including atherosclerotic cardiovascular disease and fatal arrhythmias. Seizure medications that block sodium channels can prolong QTC, QRS, and PR intervals on the electrocardiogram (ECG). Lamotrigine, a sodium channel blocker, is the first seizure medication with FDA warning with concerns of serious arrhythmias and/or death in people with underlying cardiac disorders. Because of this labeling change, the use of seizure medications with a similar mechanism of action should be used cautiously in the absence of additional information.

Research Question or Hypothesis: Does the use of seizure medications influence cardiac function in patients with and without comorbid cardiac conditions by causing changes in ECG patterns?

Study Design: Single-center, retrospective study June 2022 to February 2023.

Methods: Inclusion criteria: age ≥18 years and on seizure medication. Two cohorts studied, with or without cardiac comorbidities at baseline. Cardiac adverse events measured by changes in the QRS, QTc, PR interval, heart rate, blood pressure, and troponin level.

Results: Reviewed 2,600 patients. Seizure medications did not affect the QTc or QRS interval in patients with and without cardiac comorbidities. Increased QRS duration noted in patients with cardiac comorbidities irrespective of seizure medication use. Increase in PR interval seen in patients taking seizure medications without cardiac comorbidities (mean difference 8.033ms, p=0.0183). The significant increase in PR interval length in patients without cardiac comorbidities implies that seizure medication can affect ECG values.

Conclusion: Seizure medications may affect cardiac markers in patients with and without cardiac comorbidities. The clinical importance of these ECG changes in the real world with concomitant ECG interval prolonging medications has not been studied. Clinicians are cautioned to review these additive effects when prescribing seizure medications in patients with cardiac disease. Future studies are needed to better elucidate the clinical significance of additive medications which affect the ECG.

Tues-79. Controlled Drug Audit for an Oncology Specialty Center in London, England

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Introduction: Medication errors are preventable events that may lead to inappropriate medication use or patient harm. Errors involving controlled drugs (CDs) are of concern as they have potential for addiction

and overdose. Oncology patients often have higher utilization rates of CDs and have potential for higher rates of related medication errors.

Research Question or Hypothesis: The purpose of this drug audit was to determine the existing trends in CD medication errors within an oncology specialty center.

Study Design: A retrospective drug audit of medication safety reports from a large oncology specialty center in London, England.

Methods: Safety reports were reviewed from January 2020 - December 2022 if they involved a CD from the oncology unit. Data collected included incident description, ward location, medication error category, incident harm level, action taken by incident manager, and drug administered. Ethics were not required.

Results: There were 164 medication safety reports that met inclusion criteria. The majority involved oxycodone or morphine (79%), while zero resulted in patient harm. The most frequent CD errors were in administration (45%); the wrong drug, dose, or dosage form was administered for 47% of those. The next most frequently reported CD errors were in prescribing (14%), drug storage (12%), poor documentation (10%), and dispensing (10%). In 2022, agency nurses accounted for ~17% of administration errors and 10% of reported errors involved a dose miscalculation. Compared to the two previous years, 2022 experienced more incidents of patients receiving expired medications (n=5 vs. n=0).

Conclusion: While no harm resulted from the errors, this audit revealed opportunities for process improvement and education to further optimize the use of CDs for oncology patients. Pharmacy can assist nursing through diligent expired medication evaluation, removing medications from cupboards for discharged patients, and supporting competency training on medication calculations and nurse-nurse CD checking to help reduce medication administration errors.

Tues-77. Physicians' Perceptions, Awareness, and Beliefs of Adverse Effects of Proton Pump Inhibitors and Impact on Prescribing Patterns

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Introduction: Inappropriate proton pump inhibitors (PPIs) use is now attracting increasing scrutiny due to concerns about a range of published possible serious adverse effects (AEs). Therefore, it is imperative to provide greater insight into how these AEs have influenced real-world practice

Research Question or Hypothesis: What are the physicians' perceptions, awareness, and beliefs toward PPI AEs and their impact on PPI prescribing?

Study Design: Quantitative and cross-sectional.

Methods: Data were collected using a validated self-administered questionnaire. A total of 500 physicians working in primary and secondary public health care settings were approached to be included in this study.

Results: The response rate was 77.8% (389//500). Seventy-five percent of respondents were very much or somewhat familiar with published data on PPI AEs. Of those, 86.3.% had very much or somewhat changed their PPI prescribing habits. Sixty-two percent reported being very much or somewhat concerned in general about AEs when prescribing PPIs. Most respondents indicated their awareness of osteoporosis/osteopenia (90%), hypomagnesemia (82.5%), vitamin B12 deficiency (81.2%), bone fracture (79.9%), iron deficiency (78.1%), Clostridium difficile infection (77.6%), calcium deficiency (77.1%) chronic kidney disease (73.5%), and acute interstitial nephritis (73.0%) as AEs associated with PPIs use. Of those, over three-quarters believed that PPIs increase the risk for 4 of 18 AEs enquired, osteoporosis/osteopenia (90%), hypomagnesemia (83.5%) vitamin B12 deficiency (77.2%), Clostridium difficile infection (76.8%). The common strategies for PPI de-escalation were PPI discontinuation (63.8%) and using PPI only on-demand (57.6%). The majority agreed that PPI overuse is commonly present in Kuwait (87.1%) and necessary to carry out education on the PPI rational use for medical staff and the public (79.7%).

Conclusion: Physicians in Kuwait are aware of and believe that PPIs cause multiple AEs, are concerned about PPI AEs, and modified their prescribing patterns by de-escalating PPIs. Future interventions should focus on educational programs to ensure rational PPIs use.

Nephrology

Sun-88. Clinical outcomes of trimethoprim/sulfamethoxazole in critically ill patients with *Stenotrophomonas maltophilia* bacteremia and pneumonia utilizing renal replacement therapies

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Introduction: The clinical outcomes of Trimethoprim-sulfamethoxazole (TMP/SMX) doses used for treating *S. maltophilia* in critically ill patients on renal replacement therapies (RRT) are not established.

Research Question or Hypothesis: We sought to assess the clinical outcomes of the suggested doses of TMP/SMX in patients with sepsis utilizing RRT.

Study Design: A retrospective observational investigation study conducted at our quaternary care hospital.

Methods: A retrospective chart review was performed on all critically ill adults with *S. maltophilia* infections who received RRT between May 2015 and January 2022. The primary endpoint was clinical cure, while the secondary endpoints were microbiologic cure, 30-day infection recurrence, and 30-day mortality

Results: Forty-five subjects met the inclusion criteria. The median age was 70 (63.50-77.0) years, 59.1% were males, and the median BMI was 25.7 (22 - 30.2) kg/m^2. Clinical success and failure were reported in 18 (40 %) and in 27 (60%) cases respectively. Of the 35 subjects who had repeated cultures, 50% had microbiologic cure (clinical cure group) versus 8% in the clinical failure group. There was no significant difference in the 30-day reinfection rates in both groups, however, mortality was significantly higher in the clinical failure group 12 (44.4%) versus none in the clinical success group (p=0.001). The median daily dose of TMP/SMX on Continuous Veno-Venous Hemofiltration was 1064 (776-1380) in the clinical cure group versus 768 (540-1200) mg daily in the clinical failure one (p=0.03). While the median dose for those who received intermittent hemodialysis was 500 (320-928) mg versus 672 (440-1012) mg daily in both groups respectively, (p=0.372).

Conclusion: Although the *S. maltophilia* isolates were reported as susceptible, the outcomes of TMP/SMX conventional doses to treat bacteremia and pneumonia caused by this pathogen in critically ill patients utilizing RRT were associated with high rates of clinical and microbiologic failure as well as mortality. Larger studies are needed to confirm our findings

Tues-84. Outcomes of an erythropoiesis-stimulating agent protocol: A case-crossover study

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Introduction: Erythropoiesis-stimulating agents (ESAs) targeting hemoglobin levels >11 g/dL increase mortality and serious adverse events without clinical benefit. Thus, the FDA changed hemoglobin targets for ESAs from "10-12" to "10-11". To maintain hemoglobin levels, a pharmacist-monitored ESA prescribing and monitoring protocol was created.

Research Question or Hypothesis: Will the ESA protocol reduce venous thromboembolism (VTE), maintain hemoglobin levels, and lower ESA costs in adults with chronic kidney disease (CKD)?

Study Design: A single-center case-crossover study

Methods: The study included adults with CKD who received epoetin for at least six months and had their orders renewed after the protocol was implemented. Cancer patients were excluded because their hemoglobin target was lower. The study compared patient outcomes six months before and after the protocol. The development of VTE during the study period was the primary endpoint. Secondary outcomes included VTE-related mortality, any hemoglobin concentration >11.3 or <9, and the mean epoetin cost per patient. The McNemar's test was used to compare the rate of VTE, mortality, and hemoglobin levels outside targets, while the paired t-test was used to compare costs. For statistical test comparisons, a two-sided *p* value of 0.05 was used to define statistical significance, and IBM SPSS Statistics software version 26 was used.

Results: The inclusion criteria were met by 61 patients. Fifteen (25%) VTE occurred before and one (1.6%) after the protocol was initiated [p<0.001], one VTE-related death occurred before and none after, and 62% of patients had hemoglobin >11.3 before and 30% after [p<0.001], 36% had hemoglobin <9 before and 45% after [p=0.319]. The mean±SD hemoglobin pre-protocol was 10.27±1.57 and 10.02 ±1.44 after [p=0.181]. The six-month cost of epoetin per patient was US $526 before and $503 after [$p$=0.842].

Conclusion: In this study, the ESA protocol reduced VTE and helped maintain hemoglobin levels within the target range in CKD adult patients, but it did not lower the epoetin cost.

Mon-100. Exposure to Potentially Inappropriately Prescribed Medications Based on Renal Dosing Criteria among Medicare Patients Receiving Peritoneal Dialysis

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Introduction: Exposure to supratherapeutically dosed or contraindicated medications based on renal dosing criteria, also known as potentially inappropriately prescribed medications (PIPM), is unknown among patients on peritoneal dialysis (PD).

Research Question or Hypothesis: How many patients receiving PD were exposed to PIPM and what characteristics were associated with exposure to PIPM.

Study Design: This was a retrospective longitudinal cohort analysis of patients who started PD in 2018 in the United States Renal Disease System database. Inclusion criteria were being >65 years of age, continuously enrolled in Medicare Part D for 12 months, and prescribed ≥1 medication(s) at the start of dialysis.

Methods: Prevalence of exposure to PIPM was determined at the start of dialysis and quarterly over one year. Logistic regression evaluated which patient characteristics (age, sex, race, Hispanic ethnicity, rurality, social deprivation index (SDI), United States region, polypharmacy, and diagnosis of diabetes and hypertension) were associated with exposure to ≥1 PIPM at the start of PD.

Results: There were 3,760 patients included and 28.7% were exposed to PIPM at the start of dialysis and 21.8% were still exposed to PIPM by the end of the first year. Medications most identified as PIPM were gabapentin (3.8%), hydrochlorothiazide (3.8%), glimepiride (3.6%), fenofibrate (3.2%), famotidine (2.9%), rosuvastatin (2.9%), atenolol (2.6%), sitagliptin (1.3%), benazepril (1.0%), and chlorthalidone (1.0%). Patients with ≥4 vs. <4 medications were at 2.8-14.1 times the odds of being exposed to PIPM (<0.001). Other key characteristics associated with exposure to PIPM were ≥85 vs. <75 years of age (aOR 0.67, 95%CI 0.48-0.95 p=0.03), living in the South vs. the Northeast (aOR 1.30 95%CI 1.02-1.66, p=0.04) and diagnosis of diabetes (aOR 1.52, 95%CI 1.29-1.78, p<0.001).

Conclusion: This study found approximately 20-30% of patients with PD were exposed to PIPM during 2018-19. The results from this study support the need to create medication management programs to identify and decrease exposure to PIPM.

Sun-87. Efficacy and safety of ertapenem dosing in patients with ESBL producing *Enterobacterales* infections utilizing renal replacement therapies

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Introduction: Clinical efficacy and safety of the FDA approved doses of ertapenem in patients utilizing renal replacement therapies (RRT) are not established

Research Question or Hypothesis: We sought to investigate the efficacy and safety of ertapenem suggested doses in patients with sepsis secondary to ESBL producing *Enterobacterales* and utilizing RRT.

Study Design: A retrospective observational study conducted at our quaternary care hospital.

Methods: The study was conducted between May 2015 and December 2021. The primary end point was the 30-day mortality, while the secondary end points were the clinical cure, microbiologic cure, 30-day recurrence, and incidence of seizures.

Results: During the study period, 158 met the inclusion criteria. Of those, males were 86 (54.4%), while the mean age was 66.4 ±13.8 years, and mean weight was 77±22.4 kg. Bacteremia was the most common diagnosis occurred in 48 (30.4%) subjects, followed by urinary tract infection in 39 (22.2%) subjects, then by pneumonia in 35 (22.2%) patients. The most isolated pathogens were *Escherichia coli* followed by *Klebsiella* species The median ertapenem dose was 0.5 g intravenous (IV) daily in those who received intermittent hemodialysis (IHD) and 1g IV daily for those who received Continuous Veno-Venous Hemofiltration (CVVH). The 30-day mortality rate was 24%, clinical cure rate was 89.2%, microbiologic cure rate was 82%, 30-day recurrence rate was 41.1%, and the incidence of seizures was 2.5%. The multivariate logistic regression analysis indicated that the age OR 1.04; 95%*CI* (1.003-1.075), critically ill patients at therapy initiation OR 2.9; 95%*CI* (1.1-7.5), and *Enterobacterales* other than *Escherichia coli* and *Klebsiella* species OR 3.8; 95%*CI* (1.1-12.5) were the significant independent risk factors associated with mortality in this population.

Conclusion: Our findings suggest that the suggested doses of ertapenem in patients utilizing IHD and CVVH are clinically effective, however, they may pose higher risk of seizures. A larger pharmacokinetic/outcomes study is needed to validate our findings

Mon-109. Impact of gum acacia on gut-microbiota derived metabolites in chronic kidney disease patients

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Introduction: Intestinal dysbiosis been demonstrated in chronic kidney disease (CKD) patients and has been considered as a contributor to disease progression due to over-production of proteolytic microbial uremic toxins. Hence, gut microbiota appeals to be a potential therapeutic target in CKD dietary management raising interest to investigate the potential role of various dietary fibers putting intestinal health into consideration.

Research Question or Hypothesis: This study is mainly directed to investigate the potential benefit of gum acacia as a gut-microbiota targeted therapeutic option in the management of chronic kidney disease.

Study Design: A parallel two-arms with 1:1 allocation, open-labelled randomized clinical trial was conducted in the period between July 2022 till April 2023

Methods: Patients aged > 18 years with Stage 3 to 5 non-hemodialysis CKD (chronic kidney disease) were eligible for inclusion. Pregnancy, lactation, inflammatory bowel disease, malignancy and antibiotic consumption during the past month were recognized as exclusion criteria. Total 108 patients were eligible for inclusion and were randomly allocated into intervention (25 grams gum acacia daily) arm and control arm. Patients were followed up for 3 months. Primary

outcomes were to assess difference in kidney function (urea, creatinine and glomerular filtration rate), serum levels of uremic toxins (p-cresyl sulfate (pCS) and indoxyl-sulfate (IS)) between baseline and follow up.

Results: A total of 80 patients completed the study. At baseline, both groups did not significantly differ in age or any other socio-demographic variables. After 12 weeks, intervention group showed a significant decrease in serum levels of both PCS and IS by 13.08% (P 0.0008) and 20.3% (P 0.001) respectively, while both levels of PCS and IS increased significantly in control group by 24.1 % (P 0.007) and 11.28% (P 0.01) respectively

Conclusion: To conclude, our study demonstrated the potentiality of gum acacia in reducing uremic toxin production, preserving kidney function and retarding the progression of CKD.

Sun-93. Evaluation of High Dose Post-dialytic Cefepime in Kidney Failure Patients with Hemodialysis Using Monte Carlo Simulation

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Introduction: Once daily intravenous cefepime dosing is generally recommended in patients with kidney failure (KF) receiving intermittent hemodialysis (IHD) but requires hospitalization or daily clinic visits. Post-dialytic administration with a higher cefepime dose can offer an alternative treatment option for some patients who are managed in an outpatient dialysis center. However, limited pharmacokinetic data exists regarding post-dialytic cefepime dosing in these patients.

Research Question or Hypothesis: This study was performed to predict efficacy and safety of post-dialytic cefepime dosing in patients with KF receiving thrice-weekly IHD compared with daily dosing.

Study Design: In-silico study using Monte Carlo simulation (MCS)

Methods: One-compartment pharmacokinetic models were developed using pertinent demographic and pharmacokinetic data to generate cefepime plasma concentrations in anuric patients with KF receiving 4-hour IHD thrice-weekly (Mon-Wed-Fri) at dialysate rate 800 mL/min. MCS was performed to compare the probability of target attainment (PTA) of cefepime 2g post-dialytic and 1g daily dosing regimens in a 5,000 virtual cohort for one week. The pharmacodynamic target was 60% free plasma concentrations above the minimum inhibitory concentration (60%fT>MIC; MIC=8 mg/L for *Pseudomonas aeruginosa*) with PTA>90% being optimal for efficacy. For safety, the pre-dialysis plasma concentrations were evaluated using the suggested neurotoxicity threshold of 20 mg/L.

Results: For efficacy, cefepime 2g post-dialytic dosing attained PTA>90% everyday but the last of a 3-day interdialytic period (ie. PTA 65.9% on Sunday) while 1g daily dosing attained PTA>90% on each of all simulated days. For safety, 2g post-dialytic and 1g daily dosing regimens elevated pre-dialysis concentrations above the threshold in up to 71% and 100% of a 5,000 virtual cohort.

Conclusion: Cefepime 2g post-dialytic dosing is likely suboptimal for a 3-day interdialytic period. For safety, while potential toxicity risk is higher with 1g daily dosing, both dosing regimens pose significant neurotoxicity risk in most KF patients receiving thrice-weekly IHD. Clinical studies are warranted to validate these MCS findings.

Mon-97. Vaccine effectiveness of BNT162b2 and CoronaVac against SARS-CoV-2 Omicron BA.2 in CKD: A case-control study

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Introduction: The ongoing COVID-19 pandemic has posed increased risks of hospitalization and mortality in patients with underlying chronic kidney disease (CKD).

Research Question or Hypothesis: Current data on vaccine effectiveness (VE) of COVID-19 vaccines are limited to priming doses in patients with CKD on dialysis and seroconversion in the non-dialysis population.

Study Design: Case-control study in adults with CKD using data extracted from the electronic health record database in Hong Kong.

Methods: Adults with CKD and COVID-19 confirmed by polymerase chain reaction were included in the study. Each case was matched with up to 10 controls based on age, gender, and index date (within 3 calendar days). The VE of BNT162b2 and CoronaVac in preventing COVID-19 infection, hospitalizations, and mortality was estimated using conditional logistic regression adjusted by patients' comorbidities and medication history during the outbreak from January to March 2022.

Results: A total of 20,570 COVID-19 cases, 6,604 COVID-19-related hospitalizations, and 2,267 COVID-19-related mortality were matched to 81,092, 62,803, and 21,348 controls, respectively. Compared to the unvaccinated group, three doses of BNT162b2 or CoronaVac were associated with a reduced risk of infection [VE: BNT162b2: 64.6% (95% CI: 61.2 – 67.7), CoronaVac: 43.8% (95% CI: 39.4 – 47.8)], hospitalization [VE: BNT162b2: 82.5% (95% CI: 78.2 – 85.9), CoronaVac: 80.8% (76.7 – 84.2)], and mortality [VE: BNT162b2: 95.4% (95% CI: 90.1 – 97.8), CoronaVac: 94.0% (95% CI: 89.5 – 96.6)]. Much higher effectiveness was shown in vaccine recipients who received three doses of BNT162b2 and CoronaVac, compared to two-dose and one-dose recipients.

Conclusion: A dose-response relationship was observed between the number of BNT162b2 or CoronaVac doses administered and the

effectiveness against COVID-19 infection and severe COVID-19 diseases during the Omicron BA.2 pandemic in the CKD population.

Sun-89. Evaluation of erythropoietin stimulating agent use in hospitalized patients receiving hemodialysis

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Introduction: Anemia is a complication of chronic kidney disease (CKD). Erythropoietin stimulating agents (ESAs) lower the need for red blood cell transfusions while increasing hemoglobin concentrations, but increase risk of thrombotic events and tumor growth. In 2021, a black box warning for ESA use was issued for increased risk of death, stroke, venous thromboembolism (VTE), and tumor progression/recurrence.

Research Question or Hypothesis: This study compared nephrologist prescribing patterns for ESA and iron in patients receiving hemodialysis (HD) admitted for care at an academic medical center.

Study Design: IRB-approved, single-center, retrospective analysis

Methods: Patients ≥18 years diagnosed with CKD receiving HD and were hospitalized between November 2022 – April 2023 were included. The primary outcome assessed was the change in epoetin dose from outpatient to inpatient. Secondary outcomes included the percentage of patients who: received an ESA dose with a Hgb greater than 10 g/dL, had an iron profile collected within 12 weeks from admission, received iron supplementation, received a blood transfusion during admission, had documentation of gastrointestinal bleed (GIB) or VTE, and overall length of hospital admission. Data was analyzed using descriptive statistics, including median values and interquartile ranges.

Results: Thirty-three patients were included, and 82% had a change in epoetin dose. Of these 27 patients, 56% received an ESA dose exceeding their outpatient dose. Ten patients received one, or more, doses of an ESA despite having a hemoglobin level greater than 10 g/dL. Iron profiles within 12 weeks of admission were present in 10 patients. No patients experienced a GIB or VTE.

Conclusion: This study highlights variability of nephrology prescribing patterns for ESAs in patients managed by the same group of providers, even when record of outpatient dosing is available. An inpatient order set may aid in identifying patients who would benefit from iron supplementation, reducing unnecessary ESA use, and ensuring those most at need, receive proper ESA dosing.

Sun-90. The Use of Epoprostenol for Continuous Renal Replacement Therapy Circuit Patency

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Introduction: Continuous renal replacement therapy (CRRT) is commonly used in critically ill patients. Clotting of the circuit is a known complication. Minimal data exist for the use of systemic epoprostenol to maintain circuit patency.

Research Question or Hypothesis: Is epoprostenol an effective and safe therapy for maintaining CRRT filter patency?

Study Design: This was a retrospective study of patients who received intravenous epoprostenol for CRRT filter patency between December 2018 and December 2022 at IU Health Methodist and University Hospitals.

Methods: The primary outcome is CRRT filter life up to 96 hours pre- and post-epoprostenol initiation. Secondary outcomes include the incidence of bleeding and hypotension. Patients who were on CRRT and received IV epoprostenol for circuit patency were included. Patients were excluded from the primary outcome if they received less than 12 hours of treatment.

Results: 21 patients were included overall, and 18 patients were included in the analysis for the primary outcome. The median filter life in the pre-epoprostenol group was 19.2 hours (IQR 11.2 - 20.3) compared to 19.7 (IQR 12.3 - 32) hours in the post-epoprostenol group ($p = 0.223$). There was an increase in vasopressors within 2 hours after initiating epoprostenol (norepinephrine-equivalents 0.10 mcg/kg/min vs 0.16 mcg/kg/min; $p=0.003$). Four patients had a minor bleed requiring a blood transfusion of < 4 units, and no patients had a major bleed requiring a blood transfusion of ≥ 4units.

Conclusion: There was no difference in CRRT filter life after the initiation of systemic epoprostenol. There was an increase in vasopressors after epoprostenol was initiated, but there were low rates of minor bleeding and no major bleeding events. These results support the use of epoprostenol in patients who are unable to receive standard anticoagulation during CRRT. Additional studies comparing epoprostenol to other agents would be warranted to further assess the efficacy and safety of epoprostenol for CRRT circuit patency.

Sun-91. Stability and compatibility of vancomycin and cefepime admixture in two conventional peritoneal dialysis solutions

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Introduction: The preferred method to treat peritoneal dialysis-related peritonitis (PDRP) is the intraperitoneal (IP) administration of antibiotics admixed with peritoneal dialysis solution (PDS). Vancomycin and cefepime added to PDS is a therapeutic option for PDRP but stability and compatibility data for this admixture are limited.

Research Question or Hypothesis: Are vancomycin (1 mg/mL) and cefepime (0.5 mg/L) when added to a PDS stable and compatible under varying temperatures over time?

Study Design: In-vitro study

Methods: Vancomycin (1 mg/mL) and cefepime (0.5 mg/mL) were added to Dianeal 2.5% and Extraneal 2.5%. The admixtures were prepared in triplicate and stored at 4^{0}C, 25^{0}C, or 37^{0}C for 7 days. Aliquots were obtained at baseline and predefined time points up to 7 days. Stability was determined by stability-indicating high-performance liquid chromatography and defined as the drug retaining ≥90% of the initial drug concentration (IDC). Physical compatibility was determined by visual inspection, pH, and absorbance.

Results: Vancomycin and cefepime concentrations in both PDS declined over time but cefepime degradation occurred at a faster rate. Vancomycin retained ≥90% of its IDC for 7 days at 4^{0}C and 25^{0}C, and 5 days at 37^{0}C in both PDS. Cefepime's IDC was ≥90% for 7 days at 4^{0}C and 4 days at 25^{0}C in both PDS, but <90% after 8 hours and 1 day at 37^{0}C in Dianeal and Extraneal respectively. Visual changes were noted when a yellow colorization occurred after 2 days at 37^{0}C. Absorbance and pH remain unchanged.

Conclusion: Our *in vitro* study found that vancomycin and cefepime were physically compatible in both PDS although cefepime concentrations were suboptimal within 8 hours in Dianeal.

Mon-99. Exposure to Potentially Inappropriately Prescribed Medications Based on Renal Dosing Criteria among Medicare Patients Receiving Hemodialysis

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Introduction: Exposure to potentially inappropriately prescribed medications (PIPM), medications supratherapeutically dosed or contraindicated based on renal dosing criteria, is unknown among patients on hemodialysis.

Research Question or Hypothesis: What is the prevalence of exposure to PIPM among patients receiving hemodialysis and what characteristics are associated with exposure?

Study Design: This was a retrospective longitudinal cohort analysis of patients in the United States Renal Disease System database. Patients included if they were >65 years of age, receiving hemodialysis in 2018, enrolled in Medicare Part D for 12 months, and had ≥1 medication at the start of hemodialysis.

Methods: Counts and percentages described exposure to PIPM at the start of hemodialysis and quarterly up to a year. Logistic regression evaluated associations of characteristics (age, sex, race, Hispanic ethnicity, rurality, social deprivation index (SDI), United States region, polypharmacy, and diagnosis of diabetes and hypertension) with exposure to ≥1 PIPM at the start of hemodialysis.

Results: There were 33,882 patients included and 29.6% were exposed to PIPM at the start of hemodialysis. After one year, 21.8% were still exposed. Medications most identified as PIPM were gabapentin (5.2%), hydrochlorothiazide (4.6%), famotidine (3.6%), glimepiride (3.4%), rosuvastatin (2.6%), fenofibrate (2.4%), metformin (1.8%), and sitagliptin (1.8%). Patients receiving ≥4 medications vs. 0-3 were at 2-11 times the odds of being exposed to PIPM (p<0.001). Additional characteristics associated with exposure to PIPM were age ≥85 vs. <75 years (aOR 0.89, 95%CI 0.82-0.97 p=0.01), being Black/African vs. White (aOR 0.83 95%CI 0.77-0.88, p<0.001), living in a rural vs. urban county (aOR, 1.09 95%CI 1.01-1.17, p=0.02), living in the South vs. Northeast (aOR 1.22 95%CI 1.14-1.31, p<0.001), and diagnosis of diabetes (aOR 1.33, 95%CI 1.26-1.40, p<0.001).

Conclusion: This study found approximately 20-30% of patients on hemodialysis were exposed to PIPM during the observation period. The results from this study can be utilized to develop medication monitoring programs to reduce PIPM exposure.

Mon-98. Accuracy of predictive equations in estimating measured creatinine clearance for patients with adequate kidney function following traumatic injury

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Introduction: Accurate kidney function estimation is essential for dosing drugs with significant kidney elimination. Because critically ill patients with traumatic injuries can experience augmented renal clearance (ARC), it is important to ascertain precision of predictive methods to estimate glomerular filtration rate (GFR).

Research Question or Hypothesis: Does the Cockcroft-Gault (CG) or chronic kidney disease epidemiology collaboration (CKD-EPI) equation accurately predict measured creatinine clearance (mCrCl) in critically injured trauma patients?

Study Design: retrospective analysis

Methods: Accuracy of CG and the race-less CKD-EPI equations (mL/min, not indexed to body surface area) was determined for trauma patients with a 24-hour urine collection via an indwelling catheter. Precision was evaluated via root mean squared error (RMSE) and percent of estimates within 30% of mCrCl (P_{30}). Equations were considered unbiased if the 95% confidence interval (CI) for the mean error included 0. ARC was defined as mCrCl >129 ml/min/1.73m^2.

Patients with serum creatinine >1.5 mg/dL, kidney replacement therapy, chronic kidney disease, suspected rhabdomyolysis, or incomplete urine collections were excluded. Data are expressed as median [interquartile range].

Results: Two hundred patients were studied. Median age was 44 [28, 60], 76% were male, 45% were obese, 22% had traumatic brain injury, median injury severity score was 26 [20, 35], and 61% experienced ARC. Measured CrCl was 183 [141, 234] ml/min. CG and CKD-EPI equations significantly underpredicted mCrCl (135 [100, 177] and 135 [113, 155] ml/min, respectively, P < 0.001) but were unbiased with a 95% CI of -155 to 44 and -164 to 52 ml/min, respectively. Neither CG nor CKD-EPI demonstrated superior precision with a median error of -46 [-77, -19] versus -45 [-92, -14] (P=0.571), RMSE of 47 [22, 77] versus 46 [17, 92] ml/min (P=0.799), and P_{30} of 58% versus 57% (P=0.919).

Conclusion: A significant proportion of medications with predominant kidney elimination may be under-dosed in trauma patients when using conventional predictive formulas.

Neurology

Mon-105. SGLT2 & DPP-4 inhibitors protect against cognitive impairment associated with type 2 diabetes: A metabolomic approach to the possible mechanism

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Introduction: It is becoming widely accepted that cognitive impairment is one of the complications of type 2 diabetes mellitus (T2DM). Thus far, disease-modifying therapeutic interventions in cognitive disorders are not forthcoming. However, there is mounting interest in the neuroprotective action of some anti-diabetic drugs, such as dipeptidyl peptidase-4 inhibitors (DPP-4i) and sodium-glucose cotransporter-2 inhibitors (SGLT2i).

Research Question or Hypothesis: We hypothesize that combining DPP-4i and/or SGLT2i with metformin will reduce cognitive deterioration in T2DM patients.

Study Design: We conducted a cross-sectional study, where we compared T2DM patients on DPP-4i or SGLT2i in combination with metformin with a control group receiving metformin monotherapy. Moreover, a group of healthy subjects were recruited as a baseline reference.

Methods: For each patient recruited, a detailed patient profile was filled in, cognitive function was assessed using a validated Arabic version of the Montreal Cognitive Assessment (MoCA), and blood samples were collected to assess glucose control and inflammatory markers (CRP and IL-6) levels. Furthermore, metabolomic screening and pathway analysis were performed on the collected serum samples. One-way ANOVA was conducted for statistical analysis using GraphPad Prism. A P-value <0.05 was considered significant.

Results: Patients on metformin monotherapy had a significantly lower MoCA score than healthy volunteers, however, there was no significant difference between healthy volunteers and patients in the combination groups. This effect was not linked to glycemic control nor related to a reduction of typical inflammatory mediators measured. Furthermore, in comparison to healthy volunteers, patients on metformin monotherapy showed elevated D-amino acids through the metabolomic analysis conducted and showed an upregulation of the ribonucleosides degradation to ribose-1-phosphate pathway.

Conclusion: DPP-4i and SGLT2i in combination with metformin in comparison to metformin monotherapy might offer a cognitive protective effect through pathways other than glycemic control and systemic inflammation. Neuroprotection could be attributed to DPP-4i and SGLT2i overall impact on D-amino acids metabolism and changes in nucleoside metabolism.

Sat-43. Evaluation of *CYP2C19* Genotype-Guided Antiplatelet Therapy in Patients Undergoing Intracranial Aneurysm Treatment with Flow Diversion Stenting in a Real-World Clinical Setting

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Introduction: Clopidogrel, a prodrug metabolized by CYP2C19, is standard of care to prevent thromboembolic complications after intracranial aneurysm repair with flow diversion stenting (FDS). While clinical implementation of *CYP2C19* genotype-guided antiplatelet therapy selection is feasible and improves clinical outcomes in patients undergoing percutaneous coronary intervention, the feasibility and utility of this precision medicine strategy in neuro-interventional procedures remains unclear.

Research Question or Hypothesis: Is use of *CYP2C19* genotype to guide antiplatelet therapy selection feasible and associated with improved outcomes in patients undergoing intracranial aneurysm repair?

Study Design: Single-center observational cohort study

Methods: Patients undergoing intracranial aneurysm repair with FDS from 2014-2021 were included (n=112). Demographics, clinical characteristics, CYP2C19 metabolizer phenotype, medications, and outcomes were abstracted from health records. The frequency of clopidogrel or alternative therapy (ticagrelor, prasugrel) use was compared across CYP2C19 status (intermediate or poor metabolizer [IM/PM] vs. normal, rapid, or ultrarapid metabolizer [NM/RM/UM]) using a X^2 test or Fisher's exact test. The frequency of thromboembolic (ischemic stroke or transient ischemic attack) and major bleeding outcomes over 12 months was compared across CYP2C19-antiplatelet therapy groups.

Results: The population included 25.0% Black and 81.0% female patients; 7.1% presented with acute subarachnoid hemorrhage. *CYP2C19* genotype testing was performed on 110 (98.2%) patients; of these, 106 (97.2%) had results available prior to FDS and 28 (25.5%) were IM/PMs. Alternative therapy was used more frequently in IM/PMs compared to NM/RM/UMs (57.1% vs. 8.5%, respectively, p<0.0001). Though statistically non-significant (p=0.352), thromboembolic events occurred more frequently in clopidogrel-treated IM/PMs (3 events, 25.0%) compared to clopidogrel-treated NM/RM/UMs (7, 9.3%) and patients on alternative therapy (3, 13.0%). Major bleeding did not differ across groups (p=0.942).

Conclusion: A preemptive *CYP2C19* genotyping strategy to guide antiplatelet therapy selection in intracranial aneurysm repair patients is feasible in a real-world clinical setting. Larger studies are needed to assess the impact on clinical outcomes.

Mon-103. Real-World Adherence Patterns by Age Bands for Nusinersen-Treated SMA Population

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Introduction: Nusinersen (NUS), an antisense oligonucleotide approved for treatment of spinal muscular atrophy (SMA) across all ages, is administered intrathecally at a dose of 12 mg. Limited evidence exists on real-world adherence for NUS stratified by age bands.

Research Question or Hypothesis: Real-world NUS adherence does not vary by age bands.

Study Design: Retrospective database study of patients on NUS stratified by age.

Methods: Patients on NUS were identified using anonymized administrative claims from Komodo's Healthcare Map™ 1/1/2017-9/30/2022. Included were patients likely to have complete information on date of NUS initiation and continuous enrollment 12 months prior to first NUS record (index date). Using number (%) of on-time doses and distribution of inter-dose intervals, adherence was measured for loading and maintenance phases among those with ≥2 doses. Adherence was evaluated for the overall population and by age bands (in years): Infants (0 - <2); Pediatrics (Peds) (2 - <6; 6 - <18); Adults (18 - <25; 25 - <50; ≥50).

Results: Overall, 428 individuals receiving NUS were identified; 52% were female with a median age of 16 years. Two percent were infants, 51% pediatric, and 47% adult. Payor mix was Medicaid (49%), Commercial (42%) and Medicare (9%). The majority of NUS doses were received on-time (%): Overall (86); Infants (74); Peds (88;86); Adults (86;85;81). Similar results were seen for loading and maintenance phases separately. Calculated inter-dose intervals by age aligned with the expected dosing schedule of NUS, such as 4 months for maintenance doses. Median [quartile (Q)1, Q3] days from previous dose for the maintenance phase were: Overall (125 [118, 133]); Infant (114 [111, 125]); Peds (125 [119, 132]; 124 [118, 132]); Adults (124 [113, 132] ;126 [119, 135];126 [121,151]).

Conclusion: NUS doses, regardless of age, were consistent with the recommended dosing schedule.

Sat-28. The effect of alpha-1 adrenergic receptor antagonists on progression of Parkinson's Disease

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Introduction: Some alpha-1-adrenergic receptor antagonists (AARA), such as terazosin, stimulate glycolysis and increase cellular ATP levels through activation of phosphoglycerate kinase (PGK1), which has been theorized to be of therapeutic benefit in patients with Parkinson's disease (PD).

Research Question or Hypothesis: What is the effect of AARA on PD related symptoms?

Study Design: Retrospective Cohort

Methods: Veterans Affairs administrative data were used to identify patients who initiated PD-related pharmacotherapy during 2000-2019 and were concurrently prescribed an AARA. The count of incident PD-related outcome events within 1 year of follow-up was contrasted between patients prescribed a PGK activating AARA versus tamsulosin, using multivariable negative binomial regression. PD-related outcome events were identified using ICD codes indicating motor symptoms, non-motor symptoms, and other potential complications as clinical markers for the progression of PD.

Results: A total of 127,142 patients initiated drug therapy for PD during the observation period, of which 24,539 concurrently received an AARA. Incident PD-related events were observed significantly less often in patients receiving a PGK1 AARA (n=14,571) than tamsulosin (n=9,968) (IRR=0.80; 95% CI: 0.77-0.83), which remained significant after adjustment for confounding factors (IRR=0.85; 95% CI: 0.81-0.88) and in sensitivity analyses.

Conclusion: Patients prescribed a PGK1 activating AARA had fewer PD-related outcome events compared to patients prescribed tamsulosin. These results may indicate a future role for terazosin and other PGK1 activators in slowing disease progression of PD, however future randomized controlled trials are needed to fully assess this relationship.

Tues-89. Impact of COVID-19 on extended interval dosing of ocrelizumab and rituximab for multiple sclerosis

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Introduction: Ocrelizumab and rituximab are medications used to treat multiple sclerosis (MS). These medications are typically administered every 6 months. The use of extended interval dosing (EID) has limited evidence; however, delayed infusions did occur during the COVID-19 pandemic.
Research Question or Hypothesis: Understand the impact of COVID-19 on EID of ocrelizumab and rituximab for MS.
Study Design: This is a quality improvement, retrospective, descriptive database analysis.
Methods: Medical benefit claims with an associated MS diagnosis from 2017 through 2022 were collected for ocrelizumab and rituximab. Patients included in the analysis had two or more administered infusions. Administrations less than 197 days apart were defined as standard interval dosing (SID), while administrations equal to or greater than 197 days were considered EID. An index date of March 20, 2020 was used to classify infusions as pre- or post-COVID-19. The primary endpoint evaluated the proportion of SID or EID claims before and after the index date. Additional exploratory analysis of medical and pharmacy benefit claims for last known interval and high dose steroids were reviewed.
Results: A total of 2,359 claims for ocrelizumab and rituximab were identified. Prior to the index date, most claims were for SID (92% ocrelizumab, 78% rituximab). After the index date, a shift in the proportion of claims to EID was observed. The subgroup analysis of ocrelizumab and rituximab claims and use of high dose corticosteroids in 2022 identified three individual patients. The last known treatment interval for these patients were SID (1 rituximab) and EID (1 ocrelizumab, 1 rituximab). Overall, the last claims analysis revealed a moderate shift back to SID (71% ocrelizumab, 48% rituximab).
Conclusion: The claims-based analysis indicates that EID was a practice before and after COVID-19, although a shift to greater use of EID was observed. Further analysis is needed to understand the implications of EID on clinical outcomes.

Tues-88. Evaluation of Blood Pressure Variability with Clevidipine Infusion in Patients with Acute Cerebrovascular Disease

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Introduction: Blood pressure variability (BPV) has been associated with worse outcomes in patients with acute cerebrovascular diseases, including acute ischemic stroke (AIS), intracranial hemorrhage (ICH), and non-traumatic subarachnoid hemorrhage (SAH). Acute hypertension is routinely treated with intravenous bolus doses of antihypertensives followed by continuous infusions if targets are not reached. Studies are needed comparing various treatment regimens to limit blood pressure variability.
Research Question or Hypothesis: The goal of this study was to determine if clevidipine infusions can safely and effectively reach blood pressure targets and maintain blood pressure control without undesirable variability in patients with neurologic emergencies
Study Design: This was a prospective, single arm, observational study.
Methods: We enrolled a convenience sample of adult patients hospitalized for AIS, ICH, SAH or posterior reversible encephalopathy syndrome (PRES) who required clevidipine for blood pressure control within 24 hours of symptom onset between 10/2021-8/2022. Patients were included in the analysis if they received clevidipine for a minimum of 6 hours within the first 24 hours of intensive care unit admission. The primary efficacy outcome was systolic BPV during the first hour. The primary safety outcomes were acute neurological decline and acute kidney injury (AKI) defined by the KDIGO criteria. Secondary outcomes were BPV within 24 hours.
Results: Thirty patients were enrolled with a median age of 64 (58,77) and most were white (83.3%) and female (57%). The most common primary diagnosis was ICH (63%). The mean (SD) systolic BPV in the first hour as measured by standard deviation was 17.2 (9.3), as measured by average real variability was 17.2 (10.5), and as measured by coefficient of variation was 10.9 (5.6). At 24 hours the mean systolic BPV by standard deviation was 16.4 (5.6). Six patients (20%) experienced AKI.
Conclusion: Clevidipine may be an effective and safe option to treat acute hypertension in acute cerebrovascular diseases. Comparative studies evaluating BPV are needed.

Oncology

Sun-85. Are there differences in hepatic toxicity with pembrolizumab 400mg every 6 weeks versus 200mg every 3 weeks dosing regimens?

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Introduction: Pembrolizumab, an immune checkpoint inhibitor, was approved in 2014. It was studied at 200mg every three-weeks(Q3W) versus 400mg every six-weeks(Q6W). The Food and Drug Administration granted accelerated approval of 400mg-Q6W in 2020. Our 2021 study found both 200mg-Q3W or 400mg-Q6W was well-tolerated. We noted Q6W arm led to liver inflammation and faster onset of hepatotoxicity. Current published literature does not address management of changes in liver function tests(LFTs).

Research Question or Hypothesis: Are there risk factors that lead to a rise in LFTs with Pembrolizumab Q6W regimens?

Study Design: Retrospective two-year study in patients with increased LFTs on Q6W-regimen.Two arms: GroupA-dosing and hepatotoxicity, GroupB-hepatotoxicity risk factors across a 5-hospital system.

Methods: Patients included if they received one dose of pembrolizumab 200mg or 400mg with a rise in AST, ALT or bilirubin. Patients excluded for concomitant chemotherapy, oral anticancer agent or switched dosing frequency more than once.Demographic information, pembrolizumab indication, GroupA's baseline LFTS and GroupB's hepatotoxic risk factors analyzed. Numeric variables summarized as medians and interquartile ranges(IQR) by Mann-Whitney U Test. Categorical variables summarized as frequencies and compared by Chi-square, or Fisher-exact tests. All statistical differences considered significant if $p<0.05$.The Charlson Comorbidity Index(CCI) predicts patient mortality utilizing chronic conditions;Age-Adjusted Charlson Comorbidity Index (ACI)Score is modified from CCI Score.

Results: Study evaluated 388 patients. Baseline characteristics and LFTs similar in non-hepatotoxic and hepatotoxic groups.Hepatoxicity noted in 22 patients on pembrolizumab monotherapy and compared to 30 non-hepatotoxic patients. GroupA showed higher rates of hepatotoxicity in the Q3W group.GroupB showed hepatotoxic patients had higher ACI scores and liver abnormality on imaging($p<0.05$).

Conclusion: Liver toxicity rates were similar between Q3W and Q6W patients. Patients with higher ACI scores and liver abnormalities were more likely to experience liver toxicity. Overall, no significant difference in liver toxicity or risk factors was noted between the Q3W and Q6W-groups. This is the first study to evaluate this safety signal.

Tues-95. The Effect of Moderate Hepatic Impairment on ONC201 (Dordaviprone) Pharmacokinetics

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Introduction: ONC201 (dordaviprone) is a novel, orally administered, anti-cancer imipridone with demonstrated antitumor effects in patients with glioma. ONC201 is eliminated primarily by the hepatic enzyme cytochrome P450 3A4

Research Question or Hypothesis: What is the effect of moderate hepatic impairment (HI) on ONC201 pharmacokinetics (PK)?

Study Design: Open-label, parallel, single-period, single-dose

Methods: Eight participants with moderate HI as assessed by Child-Pugh criteria, and 8 participants matched for age (±10 years), body mass index (±20%), and sex, with normal hepatic function, received a single 125mg dose of ONC201. PK blood samples were collected from predose to 168 hours postdose and analyzed for ONC201 using a validated liquid chromatography tandem mass spectrometry method. PK and safety profiles were evaluated between cohorts.

To assess the effect of HI on ONC201 exposure, point estimates and 90% confidence intervals (CIs) were calculated for the ratio of geometric means for PK parameters between cohorts.

Results: All 16 participants were included in the analysis population. Geometric mean ratios and 90% CIs of ONC201 exposure in the HI cohort compared to the healthy-matched cohort were 1.21 (0.88 to 1.67), 1.49 (1.02 to 2.20), and 1.54 (1.04 to 2.28), respectively, for Cmax, AUClast, and AUCinf. Two treatment-emergent adverse events (TEAEs), COVID-19 and atrial fibrillation, were reported in 2 healthy-matched participants; both events were mild and considered not related to ONC201. No participants in the HI cohort reported TEAEs.

Conclusion: The ratio of ONC201 exposure between cohorts was less than 2-fold higher in the HI cohort compared to the healthy-matched cohort. Single dose 125mg ONC201 was well tolerated in both cohorts. The results of this study will be used to inform dosing in patients with HI.

Tues-97. Prescription Pattern of Trastuzumab Originators and Biosimilar Products for Breast Cancer Treatment: A Multi-institutional Study in Taiwan

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Introduction: Biosimilars have emerged as other economic treatment choice besides originators. However, real-world evidence about utilization of trastuzumab originators and biosimilars was still limited in Asian population.

Research Question or Hypothesis: This study aimed to evaluate the clinical prescription pattern of breast cancer patients receiving trastuzumab originators and biosimilars in Taiwan.

Study Design: The study was a retrospectively observation study conducting by Chang Gung Research Database including five hospitals covering different areas of Taiwan.

Methods: Breast cancer patients who newly receiving trastuzumab originators (Herceptin®) and biosimilars including Herzuma®, Kanjinti® and Ogivri® between January 2020 to April 2023 were included. We analyzed patients' baseline demographics between originators and biosimilar groups, including age, tumor stage, Eastern Cooperative

Oncology Group (ECOG) performance status, tumor markers and treatment type (i.e., neoadjuvant and adjuvant therapies). We described the patients' characteristics by median and interquartile range (IQR) for continuous variables, and absolute and relative frequencies for categorical variables, respectively.

Results: A total of 608 originator users and 41 biosimilar users were included. The age was similar between two groups (54.9 vs. 54.5 years, P = 0.85) For cancer stage, 77.5% biosimilar users were diagnosed as early stage (stage 0 to 2), while 55.5% originator users were in early stage. For available ECOG status, early stage biosimilar users were all scored as 0 while 91.7% originator users were scored as 0. For HER2 results, 100% biosimilar users and 96.1% originator users were HER2 positive. For treatment type, biosimilars were all prescribed in non-neoadjuvant therapy, and the percent of originators utilized in adjuvant, disease treatment and neoadjuvant therapy was 43.2%, 29.5% and 27.3%, respectively.

Conclusion: Most of the breast cancer patients newly receiving trastuzumab biosimilars were attributed to early stage in Taiwan. Long-term follow up and larger number studies are warranted to compare the treatment results between trastuzumab originator and biosimilars in Asia.

Other

Sun-102. Status of Inclusion of Transgender and Gender Diverse People in Clinical Drug Trials: An Analysis of the US ClinicalTrials.gov Registry

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Introduction: Over one million U.S. adults are transgender or gender diverse (TGD), yet gender diversity in clinical drug trials is limited.

Research Question or Hypothesis: How many drug trials in ClinicalTrials.gov included TGD people and what are the trial characteristics over the past 15 years?

Study Design: Retrospective cross-sectional cohort study using publicly available clinical trial records on ClinicalTrials.gov.

Methods: A static copy of the ClinicalTrials.gov database was downloaded from the Clinical Trials Transformation Initiative on January 28, 2023. We included interventional trials with a primary purpose of treatment registered between October 1, 2007 (the date FDA required registration of interventional trials) and the download date. To identify trials inclusive of TGD people, we reviewed study titles, keywords, and eligibility criteria. Two researchers reviewed the studies to ensure they included TGD people; a third investigator adjudicated discrepancies. We grouped studies by year of registration: October 2007-December 2015 ("early") and January 2016-January 2023 ("late"). We investigated recruitment status, eligible ages and gender identities, sample sizes and therapeutic areas for each trial. Descriptive statistics were used to summarize trial characteristics. Characteristics were reported as frequencies and percentages. Statistical comparisons utilized Fisher's exact test with $p<0.05$ considered significant.

Results: 189,249 interventional trials were registered between October 2007-January 2023; 84 trials included TGD participants, of which 28 were drug trials (2 early; 26 late). In the early vs. late groups, 2 (100%) vs. 3 (11.5%) trials completed recruitment (p=0.03); 2 (100%) vs. 25 (96.2%) enrolled adults (≥18 years, p=0.9); 1 (50.0%) vs. 13 (50.0%) enrolled all gender identities (p=0.9); 1 (50.0%) vs. 11 (42.3%) enrolled >100 participants (p=0.9). HIV prevention and treatment was the most common therapeutic area in the late vs. early group (8 [30.8%] vs. 0, p=0.9).

Conclusion: Trials inclusive of TGD people have increased markedly over the past 15 years. This trend was related to increased HIV prevention and treatment trials.

Pain Management/Analgesia

Sun-106. Role of Gabapentin in Reducing Opioid Use for Acute Pain in the Trauma Population

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Introduction: Acutely injured trauma patients are at an increased risk for potential misuse, dependence, and unintentional opioid overdose. Trauma guidelines recommend multimodal pain management with gabapentin to reduce opioid use. Although gabapentin and opioids have short and long-term adverse effects such as central nervous system depression, respiratory depression, and addiction potential, incorporation of gabapentin is an effective strategy for opioid stewardship.

Research Question or Hypothesis: Evaluate if the addition of gabapentin to standard pain regimens influences in-hospital opioid requirements for acute trauma related pain.

Study Design: Retrospective chart review of patients ≥ 18 years of age who received opioids on the trauma service for acute pain control. Patients were excluded if they received pregabalin or methadone or passed away during their hospital admission. Patients were divided into a pre-(gabapentin) or post-(non-gabapentin) arm.

Methods: 665 patients were screened, 197 were included in the non-gabapentin arm and 91 in the gabapentin arm. Opioid requirements expressed as oral morphine equivalents (OME). Pain control was assessed through mean average pain scores after treatment intervention on days 0, 1, 2, 3, 7, and day prior to discharge in both arms. Opioids and non-opioid analgesics used throughout the patient's admission were collected.

Results: Patients who received gabapentin for multimodal pain management had a greater but non-statistically significant reduction in opioid requirements from day 0 to the day prior to discharge

compared to patients who did not receive gabapentin (23 vs. 15 OMEs). Patients who received gabapentin had a greater reduction in pain scores on discharge from baseline compared to patients who did not receive gabapentin (0.96 vs. 0.05) ($P = 0.034$).

Conclusion: This study shows that incorporation of gabapentin in multimodal pain regimens can help improve pain control and assist in reducing opioid requirements to support opioid stewardship initiatives.

Sun-105. Pain control and opioid exposure after multimodal or opioid-only analgesia for acute pancreatitis in an acute care setting

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Introduction: Acute pancreatitis (AP) is a gastrointestinal condition that can cause severe pain and hospitalization. Causes and symptoms of AP vary, and no guideline on the management of AP pain exist. This results in approaches to treating AP pain that vary in drug class and route, and increases the risk of inequitable care. Multi-modal analgesia (use of opioid and non-opioid analgesics) has been shown to produce similar or better pain outcomes in non-AP conditions while reducing the risk of opioid-related harms.

Research Question or Hypothesis: Patients hospitalized for AP have similar mean pain scores within 24 hours of the first analgesic intervention when treated with multi-modal analgesia compared to opioid-only regimens.

Study Design: Retrospective, single-center, cohort study.

Methods: Patients admitted to internal medicine services at UI Health with acute pancreatitis between 9/2020 and 12/2021 were included. Pain assessment results were compared between cohorts determined by analgesic administrations. Linear regression assessed for treatment effects with additional covariates. Drug choice was reviewed as a secondary descriptive outcome. Descriptive and inferential statistics were performed using SPSS Statistics for Windows (IBM Corp).

Results: Forty-four patients were assigned to the multi-modal cohort and 50 patients were assigned to the opioid-only cohort. Mean (SD) pain score over 24 hours following first analgesic intervention did not differ 5.82 (2.4) vs. 5.39 (2.5) in the multi-modal vs. opioid-only cohort, respectively ($p=0.4$). Median morphine milligram equivalent (MME) over the same time was lower in the multi-modal group (25 mg, IQR 47.5) compared to 48 mg (69.4), $p<0.05$). There were no differences between groups in pain scores within the first 12 hours, length of stay, or time to oral tolerance.

Conclusion: Multi-modal analgesia is associated with less opioid use for patients hospitalized with AP with similar pain scores to those not receiving multi-modal analgesia. An opioid-sparing regimen was effective and options to standardize treatment should be considered.

Pediatrics

Sat-47. Impact of Meningitis PCR Panel in Decreasing Antibiotic Therapy for Presumed Neonatal Meningitis

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Introduction: Neonatal sepsis and meningitis can have severe consequences if left untreated. Diagnosing meningitis in neonates is challenging as lumbar puncture is often performed after initiating antibiotics. This study aimed to assess the impact of the FilmArray Meningitis Encephalitis PCR Panel (MEPCRP) on antibiotic duration and outcomes in neonates with culture-negative bacterial meningitis (CNBM).

Research Question or Hypothesis: We hypothesized that MEPCRP testing could reduce antibiotic use by 20% in neonates treated for CNBM without increasing reinfection rate.

Study Design: A retrospective cohort study included neonates treated for CNBM who underwent lumbar puncture after antibiotic therapy.

Methods: Cohort 1 (PRE-Imp) comprised of neonates before MEPCRP implementation, while Cohort 2 (POST-Imp) included neonates after MEPCRP implementation. Primary outcomes were antibiotic duration and reinfection within 30 days. Secondary outcomes included mortality, hospitalization duration, central line placements, necrotizing enterocolitis (NEC), and early neurodevelopmental scores. Statistical analysis involved chi-square tests, t-tests, and regression analysis.

Results: The study analyzed 100 neonates (50 in each cohort) with similar baseline characteristics. Cohort 2 exhibited significantly shorter total antibiotic therapy duration (mean 7.6±2.4 vs 13.6±5.3 days, $p< 0.0001$) for CNBM compared to Cohort 1. No reinfections occurred within 30 days. Cohort 1 had prolonged central line placements and hospitalizations for antibiotic therapy than Cohort 2 (median 7 vs 3 days, $p< 0.001$; mean 14.8±5.7 vs 8.7±2.6 days, $p<0.0001$, respectively). Factors associated with prolonged antibiotic therapy (>10 days) included gestational age, birthweight, postmenstrual age, and the need for respiratory support. No significant differences were found in laboratory markers, mortality, NEC, vasopressor use, or neurodevelopmental scores.

Conclusion: MEPCRP testing in neonates with CNBM led to a substantial reduction in antibiotic duration, central line placements, and associated hospital stays without compromising patient outcomes. MEPCRP testing presents a valuable diagnostic tool that can optimize antibiotic use, reduce costs, and prevent adverse outcomes associated with prolonged antibiotic therapy in this vulnerable neonatal population.

Sun-107. Evaluation of the safety and tolerability of undiluted IV levetiracetam at a pediatric institution

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Introduction: Intravenous (IV) levetiracetam is commonly used as a second-line antiseizure medication in status epilepticus due to few adverse effects and lack of therapeutic monitoring. Recent studies suggest rapid administration of high-dose undiluted levetiracetam in adults is safe; however, no such information exists in pediatric patients.

Research Question or Hypothesis: Undiluted IV levetiracetam (100 mg/mL) is safe and tolerable in doses up to 4500 mg compared to diluted levetiracetam (15 mg/mL).

Study Design: Retrospective, single-center, cohort analysis of patients who received high-dose ≥60 mg/kg (-10%) up to 4500 mg diluted or undiluted IV levetiracetam at a large pediatric academic medical center.

Methods: Descriptive statistics were used to characterize patient demographics, levetiracetam administration characteristics, primary outcome, and secondary outcomes. Administration of diluted vs. undiluted levetiracetam was assessed by statistical comparison tests. Comparisons of categorical data were completed using a Fischer's exact test and continuous data was analyzed using a student t-test or Mann-Whitney U test.

Results: There were 776 levetiracetam doses included, 358 doses administered and 418 doses wasted. The doses administered (61 undiluted and 297 diluted) accounted for a total of 252 patients (39 undiluted and 213 diluted) (median [minimum/maximum range] age, 2 y [1 d–32.7 y]; mean (SD) weight, 20.1 kg (22.1 kg)). The incidence of hemodynamic disturbances and infusion related reactions was not statistically significant between groups ($p = 0.87$). The median (IQR) time difference between first-line and levetiracetam administration in patients with status epilepticus was 18 minutes (10.5-30.5) vs. 36.5 minutes (21.8-67.3) in the undiluted and diluted groups; $p<0.01$. Additionally, there was a significant amount of drug waste from dispensed but not administered doses of the diluted bag compared to undiluted vials (57.6% vs. 18.7%, $p<0.01$).

Conclusion: Undiluted levetiracetam was not associated with an increased incidence of adverse effects compared to diluted levetiracetam in high-doses, up to 4500 mg given over 5 minutes in pediatric patients.

Pharmacoepidemiology

Tues-110. Evaluating the real-world safety of icosapent ethyl vs. omega-3 polysaturated fatty acid in US Veterans

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Introduction: While the REDUCE-IT trial demonstrated the cardiovascular benefit of icosapent ethyl (IPE), potential safety signals for atrial fibrillation (AF) and serious bleeding outcomes were of concern.

Research Question or Hypothesis: What is the real-world safety of IPE vs. mixed omega-3 polysaturated fatty acid (OM-3) formulations?

Study Design: Retrospective active comparator new-user cohort study

Methods: We compared rates of new-onset AF and major bleeding (MB) among adult new users of IPE vs OM-3 in 2020-2023 US Veterans Affairs data. We determined daily drug exposure via prescription dispensing dates. We identified outcomes via validated ICD-10-CM-based algorithms. We addressed measured confounding via nearest-neighbor pairwise propensity score (PS) matching. The PS, constructed via logistic regression, was informed by expert-identified variables meeting the disjunctive cause criterion. We used Cox regression to estimate hazard ratios (HRs), interpretable as average treatment effects for the treated.

Results: Cohorts for analyses of AF and MB endpoints included 1,927 and 2,015 patients, respectively, in each of IPE and OM-3 exposure groups. Mean age was ~67 years with ~93% male and ~80% white population. Overall mean follow up time was ~6 months. Baseline covariates were generally well-balanced after PS matching. Incidence rates (IRs) for AF were 7.28 vs 7.47 per 100 person-years among new-users of IPE vs. OM-3. The adjusted HR was 1.15 (95% CI 0.82-1.63). Incidence rates for MB were 3.37 vs 3.36 per 100 person-years among new-users of IPE vs. OM-3. The adjusted HR was 1.62 (95% CI 0.87-3.02).

Conclusion: While our measures of association were consistent with the null, we were unable to rule out harms of IPE (vs. OM-3) more modest than a 63% increased rate of AF and 3-fold increased rate of MB. Follow-up studies that can generate more precise estimates are warranted, spurred by increasing use of IPE.

Sun-114. Comparison of the impact of CDC versus Minnesota opioid guidelines on decreasing high total morphine milligram equivalent (MME) prescribing at post-surgical discharge in a large health system in Minnesota

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Introduction: The Center for Disease Control (CDC) published their first chronic use opioid guideline in March 2016; Minnesota published their first guideline recommending a maximum of 200 total MME for most invasive surgeries in March 2018. However, impacts of these guidelines on high MME prescribing at post-surgical discharge is unclear.

Research Question or Hypothesis: We hypothesized that the Minnesota opioid guideline would be associated with a greater decrease in high total MME prescribing than the national CDC opioid guideline in a Minnesota health system.

Study Design: A retrospective interrupted time series analysis of multiple treatment periods.

Methods: Electronic health records were aggregated from an integrated academic health system in Minnesota from 2012 to 2019. Adult patients who had undergone their first surgery and discharged with opioids were identified. Segmented linear regression analysis with Newey-West standard errors was conducted to compare the immediate and sustained effects of guidelines on the quarterly prescribing rate of high MME (>200 total MME).

Results: 164,550 patients were identified. The prescribing rate of high MME declined from 57.6% in 2012q1 to 25.3% in 2019q3. The release of the CDC guideline led to an immediate decrease of 1.6% ($p=0.373$), with a quarterly decline of 1.8% ($p=0.003$). The second intervention period, corresponding to the release of the Minnesota guideline, resulted in an immediate reduction of 9.2% ($p<0.001$), followed by a quarterly decline of 2.2% ($p<0.001$). Compared to the CDC guideline, the Minnesota guideline demonstrated a significantly larger immediate effect on high MME prescribing, with additional reductions of 7.6% ($p=0.008$). However, the additional sustained effect on slope was not statistically different (0.4%, $p=0.367$).

Conclusion: The prescribing rate of high MME at post-surgical discharge trended down after publication of 2016 CDC opioid guideline and decreased more steeply after release of 2018 Minnesota opioid guideline, while maintaining a similar trend in slope.

Pharmacogenomics/Pharmacogenetics

Sat-52. *CYP2C19* genotype is associated with adverse cardiovascular outcomes in clopidogrel-treated Black patients undergoing percutaneous coronary intervention in a real-world clinical setting

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Introduction: CYP2C19 intermediate and poor metabolizers (IM/PMs) carry a *CYP2C19* no function allele and exhibit diminished clopidogrel effectiveness and increased risk of major atherothrombotic events (MAE) after percutaneous coronary intervention (PCI). However, outcome studies to date have lacked racial diversity and primarily included patients of European and East Asian ancestry. Thus, the impact of *CYP2C19* genotype on cardiovascular outcomes in clopidogrel-treated Black patients remains unclear.

Research Question or Hypothesis: Do Black CYP2C19 IM/PMs treated with clopidogrel have increased MAE risk after PCI?

Study Design: Multi-center observational, cohort study

Methods: Adult patients of self-reported Black or African American race across five institutions who underwent PCI, were genotyped clinically for *CYP2C19*, and were treated with clopidogrel were included. Genotype and clinical data were abstracted from health records. Rates of MAE (composite of death, myocardial infarction, ischemic stroke, stent thrombosis, or revascularization for unstable angina) and a secondary outcome of major adverse cardiovascular events (MACE; cardiovascular death, myocardial infarction, ischemic stroke, or stent thrombosis) within 1-year post-PCI were compared across CYP2C19 metabolizer groups using multivariable Cox regression.

Results: The population included 569 Black clopidogrel-treated patients (median age 62 years, 46% female, 70% acute coronary syndrome indication for PCI). MAE rates were significantly higher among clopidogrel-treated IM/PMs (n=126) versus patients without a no function allele (n=443) (32.2 vs. 15.9 per 100 person-years; adjusted HR 1.89, 95% CI 1.12–3.19, p=0.017). MACE also occurred more frequently among IM/PMs (22.0 vs. 11.5 per 100 person-years, respectively; adjusted HR 1.79; 95% CI 0.96–3.35; p=0.069), although this difference was non-significant.

Conclusion: Black patients with CYP2C19 IM/PM metabolizer phenotypes who are treated with clopidogrel exhibit increased risk of adverse cardiovascular outcomes after PCI, suggesting that genotype-guided antiplatelet therapy may have clinical benefit in Black patients. Future studies are needed to determine whether genotype-guided use of prasugrel or ticagrelor improves outcomes in Black patients undergoing PCI.

Tues-114. Survey of prescribers' interest in and understanding of pharmacogenomics

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Introduction: The promise of pharmacogenomics (PGx) to improve medication safety and effectiveness is consistently demonstrated in the literature, ushering in the early majority of adopters. Successful uptake hinges on clinicians involved in patient care. Surveys of primary care providers found most lack formal training in PGx and are unprepared to utilize it. The relevance of PGx extends beyond primary care, so there is a need to assess prescriber preparedness across relevant specialties as PGx programs expand. As the profession leading PGx implementation, it's important for pharmacists to recognize where their expertise can supplement their physician and advanced practice provider colleagues.

Research Question or Hypothesis: What's the experience and perception of pharmacogenomics for prescribers across eleven specialties at an integrated academic health system?

Study Design: This is a cross-sectional, quantitative online survey.

Methods: A link to the survey was emailed to physicians and advanced practice providers at an integrated, academic health system in Rhode Island and practicing in one of eleven relevant specialties. Survey format included multiple choice, Likert-type, and Likert scale questions on respondent demographics, education on PGx, utilization of PGx, comfort with PGx, and beliefs on PGx utility.

Results: The response rate was 3.7% (60/1614) and represented eight specialties. Majority were physicians (70%) and had been practicing for either 20+ years (32%) or were currently a trainee (22%). Over 70% had no education in PGx but 77% were interested in receiving some. The mean PGx comfort score was 10 out of a possible 40. 85% agreed genetics can influence response to medications and 53% agreed they prescribe medications influenced by PGx. When asked if their patients would benefit from PGx, 22% agreed and 55% were neutral.

Conclusion: Almost all respondents had little to no experience with PGx, but were willing to learn more. There is significant opportunity to improve prescribers' comfort with using PGx in practice.

Tues-112. Validation of the Chinese version of the Minnesota Assessment of Pharmacogenomic Literacy (MAPL-C)

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Introduction: The Minnesota Assessment of Pharmacogenomic Literacy (MAPL) was recently developed and validated in English, but its generalizability in evaluating PGx literacy in other cultural settings and languages, such as Chinese, remains to be determined.

Research Question or Hypothesis: To validate the Chinese version of MAPL (MAPL-C), assess PGx literacy among native Chinese speakers, and compare response patterns to the English MAPL.

Study Design: Cross-sectional

Methods: The MAPL was converted to the MAPL-C following cross-cultural translation guidelines. A national online survey in China was conducted to validate the MAPL-C and assess PGx literacy among a random sample of Chinese speakers. Validation included factor analysis, characterization of response patterns, and associations with sociodemographic and health-related characteristics. High-quality responses 959 from adult Chinese respondents were included. Psychometric characteristics and response patterns were then compared with previously obtained MAPL data from the U.S. study sample (n=646).

Results: Participants were predominantly Han Chinese (96.3%), males (54.5%), aged 18-29 (70.9%), with at least some college education (95.0%). Chinese participants' performance on the 13-item MAPL-C revealed a three-factor model (i.e., concepts, limitations, and privacy), as compared to a single factor structure in U.S. participants. Results from the Chinese sample indicated less understanding of the limitations of PGx testing relative to other domains. Higher health literacy correlated with higher MAPL-C scores in the Chinese, but not the U.S. respondents. Higher PGx literacy was associated with younger age, higher education, and prior experience with genetic testing in both study samples.

Conclusion: Through the development and validation of the MAPL-C, we identified similarities in items that quantified PGx knowledge and associations with sociodemographic and heath variables in Chinese and U.S. participants. Differences in the recognition of PGx limitations

and the factor structure of response patterns across study samples underscores the importance of population specific validation and interpretation of results.

Pharmacokinetics/Pharmacodynamics/Drug Metabolism/Drug Delivery

Mon-119. Proteomic derived longitudinal pharmacodynamic biomarkers of IFNβ-1a Biologics

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Introduction: Proteomics has the potential to identify pharmacodynamic (PD) biomarkers for biosimilarity assessment without relying on clinical efficacy endpoints. Interferon beta-1a (IFNβ-1a) biologics are a class of biologics with limited well characterized PD biomarkers. Our previous proteomics study using plasma samples from a placebo-controlled single-dose randomized clinical study identified 249 and 530 potential candidates that were differentially expressed in response to therapeutic/high doses of IFNβ-1a (30 μg) and pegIFNβ-1a (125 μg), respectively.

Research Question or Hypothesis: To independently replicate previous candidates at a lower dose and characterize them using FDA guidelines for PD biomarkers for biosimilars.

Study Design: New proteomics data (SOMAscan® v4.1) was generated for longitudinal plasma samples from 48 healthy subjects (12 each) from intermediate and low dose groups of IFNβ-1a (15 μg or 7.5 μg) and pegIFNβ-1a (62.5 μg or 31.25 μg) from the same clinical study.

Methods: Previously identified candidates were tested for differential expression with IFNβ-1a (15 μg) and pegIFNβ-1a (62.5 μg), compared to previously published placebo data using ANOVA on linear-mixed effect models, regressing protein changes with treatment*time interaction. Candidates with *Bonferroni*-corrected p-value<0.05 were considered replicated. We further prioritized candidates based on magnitude of response, significant baseline adjusted area under the effect curve (AUEC) and a monotonic dose-response relationship using high, intermediate, and low doses and placebo data. Analysis was conducted in R (v4.1.2).

Results: Of the previously identified candidates, 166 and 325 were replicated for IFNβ-1a (15 μg) and pegIFNβ-1a (62.5 μg) respectively, of which 59 IFNβ-1a and 113 pegIFNβ-1a candidates were prioritized as PD biomarkers. Most candidates followed Emax dose-response models. Several PD biomarkers such as I-TAC, C1QT1, LAG3, and MCP-2, MX-1 were identified. I-TAC showed the largest magnitude of response and LAG-3 showed the least variance in AUEC among those identified.

Conclusion: We replicated and characterized several PD biomarkers for IFN-β1a biologics with potential utility in biosimilar development programs.

Mon-120. Pharmacokinetics and therapeutic target attainment of vancomycin in elderly patients

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Introduction: The physiological changes associated with aging can alter drug disposition, affecting therapeutic target attainment of antibiotics. While vancomycin is frequently used to treat Gram-positive infections in the elderly, current guidelines do not provide specific dosing recommendations for this population.

Research Question or Hypothesis: Would vancomycin initial target attainment be impacted by pharmacokinetic changes in elderly patients?

Study Design: Single center, prospective and longitudinal study.

Methods: Elderly patients (>65 years) with preserved renal function were considered. Vancomycin therapy started with 1g every 12 hours, one-hour infusion. Two steady-state blood samples were collected within the same dosing interval. Pharmacokinetic parameters were estimated using the one-compartment model with first-order kinetics. The therapeutic target was defined as vancomycin 24-hour area under the curve/minimum inhibitory concentration (AUC/MIC) ≥400 and <600. A linear regression was used to explore the relationship between vancomycin clearance and glomerular filtration rate (GFR).

Results: In total, 104 elderly patients were included. The patients had a median age of 75 (72 - 92) years, total body weight of 72.3 (62.8 – 84.7) kg, and GFR of 92 (74.7 - 99) mL/min/1,73m^2. The found vancomycin clearance, volume of distribution and half-life values were: 3.4 (2.8 – 4.7) L/h, 55.4 (43.2 – 69.7) L and 9.8 (7.6 – 13.8) hours, respectively. The therapeutic target was initially achieved in 35 (34%) patients, and 49 (47%) patients had supratherapeutic AUC (> 600 mg.h/L), considering MIC 1 mg/L. Dosing adjustments were made based on individual parameters to optimize target attainment, and the median corrected vancomycin daily dose was 1165 (854 – 1404) mg. Vancomycin clearance and GFR showed low correlation value ($R^2 = 0.20$).

Conclusion: Neglecting to tailor doses to individual needs of elderly patients can lead to an increased risk of vancomycin-induced nephrotoxicity due to unnecessarily high total drug exposure. The vancomycin monitoring based on PK/PD approach permits real-time dose adjustments based on individual pharmacokinetics.

Sun-118. Interoccasion Variability, Estimation Methods and Their Impact on Pharmacokinetic Estimates

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Introduction: Population pharmacokinetic (PPK) analyses are crucial for better understanding of drug PK, safety, efficacy, and its proposed optimal dosing regimen. Interoccasion variability (IOV) has been proposed to be an essential component of PPK estimation approximately 30 years ago, but only 1 Method[1] and limited research regarding its coding method has been conducted or published to date.

Research Question or Hypothesis: Which IOV coding method and estimation algorithm may be used to provide the most accurate PK results.

Study Design: Thirty studies of 40 subjects each who received 1 dose on 2 separate occasions were simulated by a blinded researcher using an oral 2-cpt PK linear model.

Methods: The 30 studies were fitted by another blinded researcher who only knew which parameters had IOV. The studies were fitted using 3 different IOV coding methods and 4 different estimation algorithms (NONMEM® FOCE, FOCEI, and MCISEM; and ADAPT5® MLEM). Population and individual IOV, population and individual parameters, their variability and residual variability results were compared between algorithms in terms of absolute bias and imprecision. Statistical significance was set *a priori* at $p<0.05$.

Results: For 30 studies:

Method #1[1]:

- No apparent difference detected between FOCE and FOCEI.

Method #2:

- MLEM appeared to have a lower bias than FOCE and FOCEI ($p<0.05$) for CL (individual values and population interCV%) and residual variability.

Method #3:

- MLEM appeared to have a lower bias than FOCE and FOCEI ($p<0.05$) for CL (population value and interCV%, individual values (FOCE only)) and residual variability
- FOCE appeared to have a lower bias than FOCEI ($p<0.05$) for individual IOV

Conclusion: IOV coding Method #3 seems to be better than Method #1 and #2. MLEM appears to perform slightly better overall than the other tested algorithms.

References:

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Tues-115. Population Pharmacokinetics and Pharmacodynamics of Cephalexin in Hospitalized Patients with High Body Weight

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Introduction: The objective of this study was to evaluate the population pharmacokinetics and pharmacodynamics of cephalexin in hospitalized patients with high body weight

Research Question or Hypothesis: Does morbidly obese patients require larger doses of cephalexin compared to non-morbidly-obese patients?

Study Design: Prospective pharmacokinetic study

Methods: Hospitalized patients expected to receive cephalexin 1 g q6h for treatment of suspected or documented infections were enrolled. Morbid obesity and non-morbid-obesity were defined as a body mass index (BMI) of ≥ 40 kg/m^2 and < 40 kg/m^2, respectively. Total and unbound serum cephalexin concentration-time data obtained from serial blood samples were analyzed simultaneously by population pharmacokinetic modeling with allometric scaling using NONMEM. Probability of target attainment (PTA) was calculated for various dosing regimens through Monte Carlo simulations based on the pharmacokinetic/pharmacodynamic target of $fT_{>MIC}$ ≥ 40% and 60%.

Results: Overall, 19 patients (9 with a BMI of ≥ 40 kg/m^2 and 10 with a BMI < 40 kg/m^2) were included in this study. A one-compartment model with linear protein binding and allometric scaling of systemic clearance using ideal body weight best characterized both total and unbound concentration-time data. Serum creatinine concentration was the only covariate significantly associated with systemic clearance ($P < 0.05$). Based on unbound concentration-time profiles using $fT_{>MIC}$ ≥ 40%, all simulated dosing regimens achieved PTA > 90% at MICs ≤ 2 mg/L; at an MIC of 4 mg/L, dosing regimens ≥ 1 g q8h attained PTA > 90% in both patient groups. At $fT_{>MIC}$ ≥ 60%, cephalexin dosages ≥ 1 g q6h attained PTA > 90% at MICs at an MIC of 4 mg/L in both patient groups.

Conclusion: The pharmacokinetics of cephalexin is comparable between morbidly obese and non-morbidly-obese patient groups. Cephalexin dosage adjustments based solely on body weight are unnecessary.

Psychiatry

Tues-116. Hypothalamic-Pituitary-Adrenal (HPA) Axis Function during Acute Stress in Premenstrual Dysphoric Disorder (PMDD)

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Introduction: Women with premenstrual dysphoric disorder (PMDD) commonly self-report inability to control their stress levels. However, it is not clear whether the hypothalamic-pituitary-adrenal (HPA) axis is dysfunctional in PMDD.

Research Question or Hypothesis: Does the trajectory of cortisol output differ in women with PMDD from healthy controls? Is the trajectory modified by allopregnanolone?

Study Design: Human laboratory study.

Methods: We recruited women who did not take medications, smoke, or consume illicit drugs, and who were free of other psychiatric conditions to provide their daily symptom ratings across 2-3 menstrual cycles, based on which we classified them as PMDD (n=16) or healthy controls (n=16). In the last menstrual cycle of the study, they underwent the Trier Social Stress Test procedure, throughout which we collected serum samples of cortisol and allopregnanolone, which we analyzed using ultra-performance liquid chromatography tandem mass spectrometry. We constructed linear mixed effects models in R to study changes in cortisol concentrations, with allopregnanolone, time, and diagnosis interaction included as fixed effects, and individual participants as random effects.

Results: Cortisol output in response to acute stress challenge was blunted in the PMDD participants ($F_{(6,142.4)}$=2.64;p=0.018), and the 3-way interaction between allopregnanolone, time, and diagnosis was statistically significant ($F_{(6,142.4)}$= 2.50; p=0.024). A further examination of the 3-way interaction showed that the neutral relationship between allopregnanolone and cortisol at baseline in the healthy control participants turned negative through the course of stress. The slope of the relationship between cortisol and allopregnanolone remained unchanged.

Conclusion: While healthy women are able to flexibly modify their HPA axis during stress as a function of their circulating allopregnanolone, women with PMDD have a blunted HPA axis that is insensitive to the effects of allopregnanolone. The present study details how tolerance to allopregnanolone in PMDD emerges in the study of the HPA function during acute stress.

Sun-121. Significant Impact of Total Duration of Clozapine Use on Norclozapine Serum Levels: A Multivariate Retrospective Analysis

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Introduction: Inter-individual variability in clozapine levels poses a challenge for treatment optimization. Norclozapine, active metabolite, is a valuable marker for assessing exposure, adherence, efficacy, and side effects. Therapeutic drug monitoring (TDM) of both clozapine and norclozapine is recommended for dose adjustments and optimal treatment. Limited attention has been given to the interaction between total duration (TD) and norclozapine levels.

Research Question or Hypothesis: Are there any association between daily dose (DD), age, gender,TD, clozapine and norclozapine serum levels in patients with schizophrenia spectrum disorders (SSD)?

Study Design: Single-center, 7-years retrospective cohort study.

Methods: Clozapine and norclozapine level assessments served as a basis for subsequent multivariate modeling, including variables of age, gender, and TD. The data were analyzed using R(v4.2.2), and linear mixed-effects models were constructed using lme4 (v 1.1.31) and lmerTest (v 3.1.3) packages. Fixed effects of age, gender and TD on clozapine and norclozapine levels were hierarchically modeled. Nested approach within patients (random-effect) was used.

Results: Total of 220 patients, 87(48.3%female) had accurate TD information available and were included in analysis. Total of 316 observations of serum concentrations of clozapine and norclozapine were analyzed. Significant positive association was found between DD and clozapine serum levels (β=0.8645, SE=0.1680,p<0.001), while age, gender, and TD showed no significant effects on serum levels. For norclozapine levels, significant positive association was found between TD and norclozapine serum levels (β=4.0495,SE=1.6819,p=0.0182) as well as DD. Clozapine/norclozapine ratio (C/N) showed significant differences between genders, with females having a higher ratio (β=3.554,SE=0.620,p<5.40e-08) compared to males(β=3.207,SE=0.583,p<1.51e-07), while DD, age, and TD of use had no significant effects on the ratio.

Conclusion: TD significantly affects only norclozapine level, while C/N is influenced by gender independently of age, dosage, and TD. Therefore, it may be speculated that C/N has limited benefit in guiding clinical decision-making. Monitoring norclozapine levels may be more beneficial for TDM, as it reflects the effects of clinical variables like TD and DD effectively.

Pulmonary

Mon-122. Evaluation of Temporary Conversion of Parenteral Brand Remodulin to Generic Treprostinil in Patients with Pulmonary Hypertension During Hospitalization: A Quasi-Experimental Study

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Introduction: Treprostinil (Remodulin) is a parenteral prostacyclin analog used for treatment of pulmonary arterial hypertension (PAH).

Guidelines recommend that treprostinil dose adjustments and monitoring be coordinated under the care of a PAH specialist. Abrupt changes in dosing can result in patient harm. Generic treprostinil was FDA approved in 2019 and replaced brand Remodulin at our health system's formulary. Generic drugs are considered pharmaceutical equivalence if the area under the curve (AUC) is between 80-125% of the brand.

Research Question or Hypothesis: The purpose of this study is to evaluate the short-term safety and efficacy of converting from parenteral Remodulin to generic treprostinil during hospitalization.

Study Design: This IRB-approved retrospective, quasi-experimental study included adult patients on parenteral Remodulin at home admitted to a quaternary medical center between 1/1/17-2/28/23. The pre-group continued brand Remodulin, while the post-group switched to generic treprostinil.

Methods: The primary outcome was clinical deterioration up to 72 hours after initiating a hospital supplied medication. Clinical deterioration was defined as one or more of the following: 10% decrease in mean arterial pressure, 20% increase in heart rate, or escalation of respiratory support from initiation of hospital supplied medication. Secondary outcomes included rate of prostacyclin-related adverse effects and cost. Descriptive data was analyzed using measures of central tendency. Continuous data was assessed with Mann-Whitney U test, and nominal and categorical with Chi-square or Fisher's Exact test. Statistical analysis completed with SPSS software.

Results: 104 patients were included in the study. Clinical deterioration occurred in 43 of 70 patients (61.4%) in the pre-group and 15 of 34 patients (44.1%) in the post-group (p-value=0.095). Adverse event occurred in 57 (81%) vs 30 (88.2%) patients (p-value=0.379). Average cost per patient was $2,924.66 vs $1,013.62 (p-value=0.001).

Conclusion: Converting hospitalized patients to generic treprostinil is safe and effective while resulting in decreased inpatient costs. Rates of adverse effects were similar.

Tues-117. Impact of Discrepancies Related to Chronic Obstructive Pulmonary Disease Medications on Hospital Length of Stay

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Introduction: Medication reconciliation (MR) compares a patient's self-reported medications with those in their current record or those being ordered to create a complete and accurate medication list.[1] Good medication adherence has been associated with a decrease in chronic obstructive pulmonary disease exacerbation (COPDe's).[2]

Research Question or Hypothesis: Do discrepancies with COPD medications impact length of stay (LOS) of COPDe's in Veteran patients ≥ 65?

Study Design: retrospective cohort study

Methods: MRs were completed by pharmacy personnel on the general medicine floor. Inclusion criteria: admitted for COPDe between February 2018-February 2020, able to participate in and had MR performed by pharmacy personnel, Veterans ≥65 years of age, known history of COPD listed in Problem List in electronic medical record, ≥ 1 active or expired medication indicated for COPD, primary discharge diagnosis of COPDe. Exclusion criteria: nursing home patients, not meeting inclusion criteria.

Results: Thirty-two patients met inclusion criteria (mean age = 75). Reasons for discrepancies were poor adherence, change in therapy, duplicate therapy, and not refilled due to adverse drug reaction (56%, 22%, 11%, 11%, respectively). Primary outcomes results were mean LOS 11 (± 26.52) vs 4 (± 2.07) days (p= 0.440 (-25.26, 11.26)) in patients without and with discrepancies, respectively.

Conclusion: Discrepancies related to COPD medications identified through MR did not have a significant impact on LOS in patients admitted for COPD exacerbations. 75% of patients who were readmitted to the hospital for a COPDe within 30 days of discharge had a COPD-related MR discrepancy. Sample size of the study population was not large enough to achieve power as defined in the protocol. Study limitations include strict COPD inclusion criteria, poor problem list documentation, and small sample size. Extreme outliers in length of stay in the patients without MR discrepancies exaggerates the difference between the groups.

Sat-56. Analysis of Educational Social Media Videos on Proper Metered Dose Inhaler Administration Technique

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Introduction: Many patients use social media platforms for healthcare advice. Metered dose inhalers (MDI's) are commonly used medication devices. Effectiveness can vary based on administration technique, so appropriate inhaler education is crucial. Educational videos on how to use MDI's are readily available on social media. Although open access videos may be helpful, they are not regularly regulated or reviewed for accuracy. This study was conducted to analyze the top social media video content relating to MDI inhaler administration technique.

Research Question or Hypothesis: Are social media videos providing accurate and comprehensive information regarding the appropriate administration techniques for metered dose inhalers?

Study Design: Qualitative, descriptive analysis of publicly available video content.

Methods: Top videos were identified on YouTube and TikTok, the two most popular video-based social media platforms. A rubric including 16 steps and counseling points to using an MDI was created. Each video was reviewed and scored independently by the study

investigators. Other information such as number of views, comments, account name and credentials, and cited references were also collected.

Results: A total of 48 unique videos were identified, 24 on YouTube and 24 on TikTok. Of the 16 steps to using an MDI, the average video included 9 of the steps. Videos on TikTok averaged 6 of the 16 steps, while videos on YouTube averaged 12 of the 16 steps. The most common steps or counseling points omitted include inspecting the inhaler for debris, closing the cap after use, optional use of a spacer, and cleaning instructions. Of the accounts, 36 (75%) have a listed credential/healthcare occupation while the remaining 12 (25%) do not list any healthcare affiliations.

Conclusion: Social media videos may help patients learn how to effectively use inhalers. However, current videos lack consistency. Pharmacists can make further efforts to ensure that social media videos do not contribute to the misuse of medications.

Sun-124. Implementation of a pharmacist-driven chronic obstructive pulmonary disease transitions of care service at an academic medical center

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Introduction: Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality in the United States, and one in five COPD hospitalizations result in a readmission within 30 days. Pharmacists have been identified as key members of interdisciplinary teams to improve transitions of care for these patients.

Research Question or Hypothesis: What is the impact of a pharmacist-driven COPD care bundle on patient inhaler technique and 30-day hospital readmissions?

Study Design: Quasi-experimental, interventional study with a historical control group

Methods: A COPD care bundle was implemented for patients presenting with a COPD exacerbation from December 1, 2021 through February 28, 2022. A historical control group was created from patients who were discharged between December 1, 2020 through February 28, 2021. Interventions included medication/inhaler optimization, medication and disease state education, immunizations, smoking cessation, and medication coverage verification. Patient characteristics, pharmacist-driven interventions, and time required for the intervention were assessed descriptively. Inhaler technique was assessed before and after pharmacist education utilizing standardized rubrics. The percentage change in inhaler scores was assessed with a Wilcoxon signed-rank test. Readmission outcomes will be analyzed using a chi-squared test.

Results: There were 30 patients in the intervention group and 46 in the control group. There were 104 interventions requiring provider collaboration, of which 84 (81%) were accepted. A median (interquartile range, IQR) of 46 (37-55) minutes was spent per patient in the intervention group. At baseline, patients scored a median of 84.6% (75-100) of steps correctly across all inhaler device types. After pharmacist education, patient scores increased to a median of 100% (92.3-100) ($P<0.0001$). There were eight (26.7%) 30-day all-cause readmission rates in the intervention group and fifteen (32.6%) in the control group ($P=0.58$).

Conclusion: Most pharmacist recommendations were accepted by providers. Medication education led to improved understanding of inhaler technique, but the intervention did not reduce 30-day readmission rates.

Substance Abuse/Toxicology

Sun-126. Efficacy and Safety of Esmethadone (REL-1017) in Patients With Major Depressive Disorder and Inadequate Response to Standard Antidepressants: A Phase 3 Randomized Controlled Trial

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Introduction: Esmethadone (REL-1017) is a promising uncompetitive N-methyl-D-aspartate receptor antagonist in development for adjunctive treatment of major depressive disorder (MDD).

Research Question or Hypothesis: REL-1017 is efficacious, safe, and well tolerated.

Study Design: Phase 3, double-blind, placebo-controlled randomized trial of oral 25 mg REL-1017 (75 mg loading dose on Day 1) or placebo for 28 days in patients with MDD and inadequate response to standard antidepressants.

Methods: Pre-randomization, clinicians from the Massachusetts General Hospital Clinical Trials Network and Institute assessed prior antidepressant response and antidepressant tolerance/tachyphylaxis (initial response followed by relapse on the same antidepressant) using the Antidepressant Treatment Response Questionnaire. Montgomery-Åsberg Depression Rating Scale (MADRS) score $\geq$35 at Day 1 (baseline) was categorized as severe depression. The primary efficacy endpoint was the change in the MADRS from baseline to Day 28.

	Mean (SD) CFB R	Mean (SD) CFB P	Mean (SD) CFB R vs P	*P* value	Effect size
mITT N 227: 113 R; 114 P	15.1 (11.3)	12.9 (10.4)	2.3 (10.9)	0.1537	0.21
PP N 198: 100 R; 98 P	15.6 (11.2)	12.5 (9.9)	3.1 (10.6)	0.0510	0.29
PP AT N 79: 43 R; 36 P	17.5 (10.4)	11.4 (9.0)	6.1 (9.8)	0.0101	0.62
PP MADRS ≥35 N 98: 43 R; 55 P	19.2 (13)	11.3 (10.1)	7.9 (11.6)	0.0015	0.68

Adverse events (AEs) were mild or moderate and transient. Seven patients discontinued the study due to AEs (5 placebo and 2 REL-1017).

Modified intent-to-treat (mITT): patients randomized and dosed, irrespective of protocol deviations or discontinuation. Per-protocol (PP): subjects completing treatment without major deviations affecting efficacy assessments.

Results: Table: N=number of subjects; R=REL-1017; P=placebo; CFB=MADRS change from baseline; AT=antidepressant tachyphylaxis

Conclusion: Efficacy outcomes favored PP analyses. Favorable efficacy outcomes were observed in post hoc analyses of PP AT subgroup and of PP subgroup with baseline MADRS ≥35. Esmethadone was safe and well tolerated.

Mon-126. Characterization of kratom use and knowledge at a rural, Oregon community health center

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Introduction: Kratom is an herbal supplement gaining attention for its widespread accessibility and use in the self-treatment of opioid withdrawal and opioid use disorder. Past efforts have described the experiences of current and former kratom users, but research to characterize use across a population is limited.

Research Question or Hypothesis: What is the knowledge of kratom, as well as the attitudes and behaviors toward kratom, among patients seeking care through a rural community health center in Oregon?

Study Design: Cross-sectional survey

Methods: We developed and refined a 36-item survey to assess attitudes toward kratom, use of kratom, and kratom knowledge. We recruited and administered the survey alongside medical office appointments from January – April 2023. Data were summarized with descriptive statistics.

Results: A total of 187 patients (of 906 patients on the clinic's panel) were invited to participate, with 150 patients returning the survey (16.6% response rate). The majority of participants were female (n=77 of 149, 52.0%), Non-Hispanic white (n=128 of 148, 86.5%), and had a median income below the federal poverty level (FPL) (n=130; 105.5% of FPL). Seventeen participants reported experience with kratom, but only one was an active user. Pain was the most common reason to have tried kratom (n=8, 47.1%) followed by a mood or mental health condition (n=7, 41.2%). Engagement in the knowledge section of the survey varied, with 55 – 80 responses per question, but of those who participated, a minority of participants were able to answer at least 3 of 5 questions correctly (n=16 of 52, 30.8%).

Conclusion: Active kratom use was uncommon in this population, but about one in ten participants had tried kratom, often to manage pain or mental health conditions. Knowledge of kratom was also low. Future research should focus on understanding behaviors related to kratom and addressing knowledge gaps.

Sun-127. No Indication of Abuse Potential or Withdrawal With Esmethadone (REL-1017): Results From Two Phase 3 Randomized Controlled Trials in Patients With Major Depressive Disorder

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Introduction: Esmethadone (REL-1017) is an N-methyl-D-aspartate receptor uncompetitive antagonist and antidepressant candidate with promising safety, tolerability, and efficacy results from Phase 1 and 2 trials. Available data indicate that REL-1017 has no meaningful opioid agonist action or abuse potential.

Research Question or Hypothesis: We hypothesized that there would be no indication of abuse potential and dependence in patients with major depressive disorder (MDD).

Study Design: Studies 301 and 303 were 28-day, outpatient, Phase 3, randomized, double-blind, placebo-controlled trials of once-daily oral 25 mg REL-1017 (Day 1 loading dose 75 mg) in patients with MDD.

Methods: In Study 301, placebo or REL-1017 was administered as adjunctive treatment to 227 patients unresponsive to standard antidepressants; in Study 303, placebo or REL-1017 was administered to 232 patients as monotherapy. We performed a safety analysis of all adverse events (AEs) and collected narratives for AEs potentially related to abuse. We assessed "drug liking," "drug high," and "desire to take the drug again" with a 0- to 100-point visual analogue scale (VAS). We used the Misuse, Abuse, and Diversion Drug Event Reporting System (MADDERS®) to assess potentially abuse-related events. We assessed withdrawal after abrupt treatment discontinuation with the Physician Withdrawal Checklist (PWC), Clinical Opiate Withdrawal Scale (COWS), and Subjective Opiate Withdrawal Scale (SOWS).

Results: Among the 459 patients receiving any study drug, AEs were predominantly mild or moderate and transient. AEs potentially related to abuse were not correlated to other measures of abuse potential and did not differ among groups. There were no differences in VAS scores and no indication of abuse on the MADDERS®. Among 354 patients who participated in the safety withdrawal assessment, change from baseline on the PWC, COWS, and SOWS did not differ between groups.

Conclusion: In 2 contemporary, Phase 3, controlled MDD studies of REL-1017, there were no indications of meaningful abuse potential or dependence.

Transplant/Immunology

Sat-60. INCIDENCE OF VENOUS THROMBOEMBOLISM AND BLEEDING EVENTS IN ADULT LIVER TRANSPLANT RECIPIENTS

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Introduction: Venous thromboembolism (VTE) and bleeding events (BE) represent significant challenges to care for post-liver transplant patients as both are associated with poorer outcomes. It is not fully concluded whether giving pharmacologic thromboprophylaxis universally after liver transplantation to prevent VTE outweighs the risk of developing BE.

Research Question or Hypothesis: What are the incidences of VTE and BE in adult post-liver transplant patients?

Study Design: A single-centered, retrospective review of medical records

Methods: Medical records of 361 adult liver transplant patients from January 2014-December 2019 were reviewed. Patients were excluded if they were on anticoagulants before the transplant. The medical records were reviewed for VTE, including deep vein thrombosis (DVT) and pulmonary embolism (PE), and BE within 30 days of transplant. Risk factors for VTE and BE such as malignancy, hyper/hypocoagulable disorders, etc., as well as anticoagulant usage, were collected. Descriptive statistics were used for the analysis.

Results: 343 medical records were included. The majority were male (85.1%) and Caucasian (62.7%). The most common indication for transplant was alcoholism (27.6%). The average MELD and MELD-NA scores were 21 and 22. Six patients (1.7%) experienced a VTE within the 30 days post-liver transplant, including 1 DVT and 5 PE. The average time from transplant to VTE diagnosis was 5.7 days (SD = 6.8). Among the 6 patients with VTE, 4 initiated anticoagulants for VTE treatment and 2 did not due to massive PE resulting in death. Sixteen (4.7%) patients were identified as symptomatic bleeding within 30 days and 6 (37.5%) of those were on VTE prophylaxis. The average time to a BE was 8.3 days (SD = 9.3).

Conclusion: VTE occurred infrequently early post-transplant with a rate of 1.7%, while BE at 4.7%. Given the numerically higher incidence of BE than VTE post-liver transplant, our current practice of an individualized approach to VTE prophylaxis based on patients' risk factors is justified.

Sat-59. Effect of pre-transplant angiotensin II type 1 receptor antibody (AT1R-Ab) positivity on kidney transplantation graft outcomes

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Introduction: Angiotensin II type 1 receptor antibody is known to associate with antibody mediated rejection as well as the poor overall kidney graft outcomes.

Research Question or Hypothesis: This study is to determine the effect of AT1R-Ab positivity on the clinical outcomes of kidney graft in a single center. It is hypothesized that there are no differences in the graft outcomes between the patients with AT1R-Ab positivity and control groups.

Study Design: This is a retrospective, observational study.

Methods: Among a total of 130 kidney graft recipients at the St. Joseph Medical Center from 2018 to 2022, a total of twenty one patients with pre-transplant AT1R-ab positivity were identified (study group) and the same number of risk factor matched control group (age, sex, diabetes and number of transplant) were selected. The biopsy data for graft rejection, eGFR, and systemic blood pressure (SBP) at baseline, 3-month, 6-month, 9-month, and 12-month were collected and compared between two groups. In terms of statistics, Chi square test and a student t test were used for the categorical data and for the continuous data and p value <0.05 is considered to be significant.

Results: The incidences of acute graft rejection were 30 % in the study group and 9% in the control group (p= 0.029). eGFRs (ml/min) were significantly lower in the AT1R-ab positive patients compared with the control group except for at baseline; the study group vs. the control group (30.9±13.5 vs.39.1±13.5, P=0.054), at 3 months (54.2 ±18.5 vs. 67.3±14.6, p= 0.015), 6 months (53.6±21vs.67.9±14.0, p= 0.014), 9 months (56.0±21.2vs.70.2±15.8, p= 0.014), and at 12 months i(52.0±20.9 vs.68.1±16.4, p= 0.008). In the case of SBP (mmHg), it was significantly higher in the study group compared to the control group.

Conclusion: This study demonstrates that pre-transplant AT1R-Ab positivity results in the poor graft outcomes during 12 months post-kidney transplant.

Mon-131. Characterizing tolerability and outcomes of second line agents used for *Pneumocystis jirovecii* pneumonia prophylaxis in kidney transplant recipients

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Introduction: Kidney transplant recipients are at risk for *Pneumocystis jirovecii* Pneumonia (PJP) after transplant. Sulfamethoxazole-trimethoprim (SMX-TMP) is the agent of choice for PJP prophylaxis. However, patients may experience hypersensitivity reactions or adverse effects from SMX-TMP and may require a second line agent such as dapsone or atovaquone. This study sought to determine the preferred second line agent in our patient population.

Research Question or Hypothesis: What is the preferred second line agent (dapsone or atovaquone) for the prevention of PJP in kidney transplant recipients intolerant to SMX-TMP at our center?

Study Design: Retrospective chart review evaluating first-time adult kidney transplant recipients from June 2013 - February 2022.

Methods: Patients were included if they initiated either dapsone or atovaquone as second line agents for PJP prophylaxis within 30 days of transplant. The primary endpoint was the percent of patients unable to tolerate a complete course of prophylactic therapy. Intolerability was defined as discontinuation of either agent due to reported hypersensitivity, adverse effects, or patient preference. Secondary endpoints included the incidence of PJP and readmissions due to PJP infection within one year of transplant. Data were analyzed with inferential and descriptive statistics.

Results: Six hundred sixty-six subjects were screened and 42 kidney transplant recipients were initiated on either dapsone (n=33) or atovaquone (n=9) within the first 30 days after their transplant. Discontinuation occurred in 12 patients (36%) in the dapsone group and 0 patients in the atovaquone group (p=0.032). The average time to discontinuation was 51 days. The primary reasons for discontinuation were anemia (67%), thrombocytopenia (8%), and elevated transaminases (8%). No patients in either group developed a PJP infection within the study period.

Conclusion: Atovaquone demonstrated greater tolerability compared to dapsone. Both agents were effective in preventing PJP infection within one year of kidney transplant.

Tues-125. Is everything ok? Incidence of hyperkalemia after converting to daily trimethoprim-sulfamethoxazole in place of Monday, Wednesday, Friday dosing in lung and heart-lung transplants.

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Introduction: The American Society of Transplant recommends Pneumocystis jirovecii pneumonia (PJP) prophylaxis with trimethoprim-sulfamethoxazole (TMP-SMX) after lung and heart-lung transplant (LTx). The optimal dosing regimen is not known.

Research Question or Hypothesis: This study compared the incidence of hyperkalemia between TMP-SMX double strength Monday, Wednesday, Friday (DS MWF) and single strength (SS) daily prophylactic regimens in lung and heart-lung transplants to provide greater guidance on dosing and safety.

Study Design: This was a retrospective chart review of 207 adult LTx recipients comparing PJP prophylaxis with DS MWF regimen from 1/2016-12/2019 against SS daily from 1/2019-12/2022.

Methods: The primary endpoint was incidence of hyperkalemia as measured by serum potassium level > 5.5 mEq/L within the first-year post-transplant. Secondary safety endpoints included number of patients with at least one event of severe hyperkalemia requiring intervention, types of interventions used, and number of patients who discontinued TMP-SMX due to hyperkalemia. Secondary efficacy endpoints included incidence of PJP, Nocardia, or Toxoplasma infections. Level of significance (alpha) was set at 0.05.

Results: Compared to DS MWF (n=117), the SS daily (n=90) regimen had a statistically significant higher number of the following: hyperkalemic incidences (545 vs 895, p=0.01), patients who had at least one event of hyperkalemia (74% vs 89%, p=0.03), who had at least one event of severe hyperkalemia (45% vs 58%, p <0.001), and who discontinued TMP-SMX due to hyperkalemia (1.7% vs 6.7%, p=0.03). There were no significant differences between groups for potassium and glomerular filtration rate (GFR) median levels at months 3, 6, and 12 and no PJP, Toxoplasma, or Nocardia infections.

Conclusion: SS daily was associated with a higher incidence of hyperkalemia as compared to DS MWF during the first year of post-lung

and heart-lung transplants. Both regimens had similar efficacy in preventing PJP, nocardia and toxoplasma infections.

Mon-130. Utility of miROmics for the Identification of Circulating Pharmacodynamic Biomarkers of IFNβ-1a Biologics

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Introduction: The U.S. Food and Drug Administration is conducting research to inform on critical aspects of the use of pharmacodynamic (PD) biomarkers to support the demonstration of biosimilarity, which can streamline development programs by negating the need for comparative clinical studies with efficacy endpoint(s). miRNA profiling (miRomics) has the potential to identify PD biomarkers for PD similarity assessment without relying on clinical efficacy endpoints.

Research Question or Hypothesis: To evaluate the utility of miRomics and an analytical framework for identifying potential circulating PD biomarkers of IFNβ-1a and pegIFNβ-1a products.

Study Design: A pilot study was conducted using plasma samples from 36 healthy subjects from a placebo-controlled randomized single dose clinical study with IFNβ-1a and pegIFNβ-1a.

Methods: Using miRNA-sequencing, we measured miRNAs at baseline/pre-treatment in all subjects, and at 9 timepoints, over 6 days in the IFNβ-1a group (n=11 [30μg]), and at 11 timepoints, over 13 days in the pegIFNβ-1a group (n=11[125μg]) and placebo-specific groups (n=6 each) and identified 108 mature miRNAs (with 10 read/count minimum in 50% of samples). We conducted linear-mixed effect models regressing normalized count changes from baseline with treatment*time interaction. miRNAs with false discovery rate-corrected p-values<0.1 were considered differentially expressed. Analysis was conducted in R (v4.1.2). DIANA-miRPath v3.0 was used for functional characterization of miRNA biomarkers.

Results: We identified 11 and 13 differentially expressed miRNAs over treatment and time by IFNβ-1a and pegIFNβ-1a, respectively, compared to placebo. hsa-miR-223-3p and hsa-miR-21-5p were common for both products. Importantly, hsa-miR-223-3p regulates Mx1 and STAT1 which are proposed individual candidate PD biomarkers for IFNβ-1a and pegIFNβ-1a and are also involved in IFNβ-1a signaling. Functional analysis of top miRNAs identified 24 overlapping pathways for both products including Hepatitis B and Hippo signaling.

Conclusion: Using miRomics, we identified two plasma miRNAs as potential PD biomarkers of IFN-β1a biologics for further investigation to support biosimilar development programs.

Mon-132. Safety of Once-Weekly Dapsone for Pneumocystis jirovecii Pneumonia Prophylaxis in Kidney Transplant Recipients

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Introduction: Sulfamethoxazole-trimethoprim (SMZ-TMP) is recommended first-line for pneumocystis jirovecii pneumonia (PJP) prophylaxis in kidney transplant recipients. In cases of sulfa allergy or intolerance, our center utilizes dapsone 100 mg once weekly as alternative prophylaxis. Both agents have the potential to cause hematologic abnormalities.

Research Question or Hypothesis: Compare hematologic adverse effect profiles of weekly dapsone vs SMZ-TMP in kidney transplant recipients.

Study Design: Retrospective, single-center, cohort study.

Methods: Adults who received a kidney transplant between 01/01/2016 and 12/31/2021 and received SMZ-TMP or dapsone for PJP prophylaxis were included. The following were excluded: multi-organ transplant, previous non-renal transplant, HIV positive, or died within six months of transplant. Cohorts were assigned by PJP prophylaxis prescribed at post-operative day (POD) 30. The primary endpoint was the change in hemoglobin from baseline to nadir, where baseline was the hemoglobin value at POD30 and the nadir defined as the lowest hemoglobin value from POD30 to POD180. Secondary endpoints included absolute hemoglobin counts, hemoglobin nadir, and PJP incidence via polymerase chain reaction test.

Results: 521 kidney transplant recipients met inclusion criteria: 342 were assigned to the SMZ-TMP group and 179 to the dapsone group. There was no difference in the median decrease in hemoglobin (g/dL) from baseline to nadir between groups (0 SMZ-TMP vs 0.20 dapsone; p=0.104). The median time between baseline and nadir was also similar between groups (5 days vs 6 days; p=0.753). The mean nadir hemoglobin was lower in the dapsone group (10.88 vs 9.67; p<0.001), however, mean absolute hemoglobin count was lower in the dapsone group at all time points. No cases of PJP were observed.

Conclusion: Hemoglobin trends were similar in kidney transplant recipients receiving SMZ-TMP or weekly dapsone for PJP prophylaxis. Additional adverse effect comparisons are underway.

Tues-123. Evaluating the impact of Sodium-Glucose Cotransporter 2 Inhibitors on Adverse Events after Transplant

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Introduction: Primary graft dysfunction (PGD) is a significant cause of morbidity and mortality after heart transplantation (HT). No data exists for the effect of sodium-glucose cotransporter 2 inhibitors (SGT2i) use prior to HT on PGD.

Research Question or Hypothesis: Does holding SGT2i prior to HT have any impact on the development of PGD?

Study Design: This was a single-center retrospective analysis.

Methods: A total of 423 adult HT recipients from 1/2016 to 8/2022 at Stanford Health Care were included in the analysis. The primary outcome was the difference in rate of PGD between patients who were on SGLT2i and those who were not. Secondary outcomes include the difference in need for post-operative dialysis, intensive care unit (ICU) length of stay (LOS), and total LOS between these two groups. Other known factors for PGD were included for analysis.

Results: Taking SGLT2i until the time of admission for HT was not associated with any effect on the primary or secondary outcomes. However, Spearman correlation analysis showed that HT recipients with PGD were more likely to require dialysis post HT and required longer ICU and total LOS. Male sex was associated with a greater incidence of PGD, but the use of intra-aortic balloon pump (IABP) prior to HT was associated with a lower incidence of PGD. Patients with a durable ventricular assisted device (VAD) was associated with a lower incidence of dialysis requirement post HT. The need for extracorporeal membrane oxygenation (ECMO) prior to HT was associated with greater total LOS, while the requirement of dialysis post HT and the was associated with longer ICU and total LOS.

Conclusion: This study demonstrated that discontinuation of SGLT2i prior to HT had no impact on the subsequent incidence of post HT PGD, dialysis, ICU LOS, or total LOS in a multivariate analysis when controlling for other risk factors.

Sat-61. Experiences of Transplant Providers and Coordinators with Specialty Pharmacy Mandates

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Introduction: A specialty pharmacy mandate (SPM) is a rule made by insurance companies requiring patients to obtain "specialty" medications from specific pharmacies (often out-of-state or mail-order pharmacies).

Table 1.

	ASTCOPs (n=105)	ITNS (n=62)
SPM delayed discharge in last 12-months	62%	48%
SPM delayed initiation of therapy in last 12-months	65%	63%
In a setting of delay how has the cost of medication been covered:	43%	40%
Institution covers	58%	53%
Patient pays cash		

Research Question or Hypothesis: What impact, if any, do SPMs have on patient care and team member experiences post-transplant?

Study Design: Two similar surveys were distributed to transplant providers. One survey was sent to multiple American Society of Transplantation Communities of Practice (ASTCOPs) to capture transplant providers/pharmacists and the other was distributed to the International Transplant Nurses Society (ITNS) to gather nurse/coordinator experiences.

Methods: An email was sent out via ASTCOP and ITNS listservs to participate in an IRB-approved Qualtrics Survey (24 questions). The survey remained open for 8 weeks.

Results: A total of 167 respondents were included (n=105 ASTCOPs, n=62 ITNS) and 12 excluded for incomplete data. The majority of the ITNS cohort identified their role as Nurse/Coordinator (97%), while the majority of the ASTCOPs cohort as Pharmacists (76%) and Physicians (13%). At the end of the survey, over 70% reported that they agree or strongly agree that SPMs affect day to day activities and a majority (74% ASTCOP, 64% ITNS) agreed or strongly agreed that SPMs affect the ability to provide patient care. Table 1 reports the impact of SPMs on discharge and medication access. Approximately 70% reported attempting a one-time fill of specialty medications at a local pharmacy to allow discharge, however, the majority reported numerous barriers, with approximately 50% reporting it required more than 60 minutes.

Conclusion: SPMs impact care and result in delayed discharges with a significant financial impact on the patient.

Mon-60. Basiliximab vs. no induction therapy: incidence of chronic lung allograft dysfunction, lung transplant rejection, and mortality

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Introduction: Long-term outcomes assessing the incidence of chronic lung allograft dysfunction (CLAD) and acute cellular rejection (ACR) who receive basiliximab induction therapy vs. no induction therapy in patients receiving lung transplantation (LTx) are poorly understood.

Research Question or Hypothesis: This study compared the incidence of CLAD, ACR, and mortality between patients who received basiliximab for induction and those who received no induction for LTx.

Study Design: This was a single-center retrospective chart review of 195 adult LTx recipients comparing those who received basiliximab for induction vs. those who received no induction between 1/2013-12/2019.

Methods: Patients were excluded if they received multi-organ transplantation or had insufficient pulmonary function test data available in the electronic health record for analysis. The primary outcome was the incidence of CLAD at 3-years post-transplant. Secondary outcomes include short- and long-term ACR rates at ≤ and > 1-year post-transplant respectively, as well as mortality rates at 1 and 3-years post-transplant. Level of significance (alpha) was set at 0.05.

Results: In this study, 42.6% (n=83) of included LTx recipients received basiliximab for induction while 57.4% (n=112) received no induction therapy. Incidence of CLAD at 3-years post-transplant in patients who received basiliximab vs. no induction was 24.1% (n=20) and 21.4% (n=24) respectively (p=0.157). Grade A1 or greater ACR at ≤ 1 year and at > 1 year in the basiliximab vs. no induction groups were 11.3% (n=22) and 19.5% (n=38) (p=0.220) and 7.2% (n=14) and 12.8% (n=25) (p=0.241) respectively. 3-year post-transplant mortality rates were 10.8% (n=9) vs. 16.1% (n=18) in the basiliximab and no induction groups respectively (p=0.157).

Conclusion: As compared to patients who did not receive induction therapy, use of basiliximab for induction in LTx recipients was not significantly associated with greater 3-year incidences of CLAD, while long-term ACR and mortality rates may be lower in patients who received basiliximab vs. those who received no induction.

Women's Health

Sun-130. Guideline-Directed Management of Sickle Cell Disease in Pregnant Patients in the Inpatient Setting

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Introduction: Pregnant persons with sickle cell disease (SCD) experience increased morbidity and mortality. There is limited data regarding guideline-directed management of SCD-related complications and outcomes in pregnant patients in the inpatient setting.

Research Question or Hypothesis: To what degree do pregnant patients in the inpatient setting receive guideline-directed management of SCD. Secondary endpoints included healthcare resource utilization, maternal outcomes, and fetal outcomes.

Study Design: Multi-center, retrospective cohort study.

Methods: IRB-approved, chart review of pregnant females with SCD, >18 years old, with emergency or inpatient disposition between January 1, 2018 to January 1, 2023 at two urban academic hospitals. Patients with sickle cell trait or status-post hematopoietic stem cell transplant were excluded. Patient demographics, SCD management, pregnancy management, maternal and fetal outcomes were collected. Analysis included descriptive statistics.

Results: The study included 20 patients with 30 pregnancies; 9 spontaneous abortion, 5 elective abortion, and 11 pregnancies >20 weeks. In pregnancies >20 weeks, there were 50 emergency room visits, 49 inpatient admissions (total inpatient days 356), 36 inpatient admissions due to SCD; median inpatient admissions per patient, length-of-stay, and emergency room visits were 7 (interquartile range: 2-28); 2 days (2-48), and 3 (1-20), respectively. Potentially inappropriate first-trimester hydroxyurea use occurred in 13.3% (4/30). Prenatal vitamins and aspirin were administered during 31/49 and 9/49 inpatient admissions, respectively. Cesarean-section delivery occurred in 54.5% (6/11) of pregnancies >20 weeks. Maternal complications included 2 severe pre-eclampsia and 1 gestational hypertension. Fetal complications included 3/11 intrauterine growth restriction, 2/11 delivered prematurely (1 pre-eclampsia and 1 preterm premature rupture of the membranes), and 2/11 delivered with respiratory distress.

Conclusion: Opportunities exist for improvements in guideline-directed management of SCD as reflected by use of aspirin, prenatal vitamins, and hydroxyurea inappropriately in the first trimester. Frequent emergency and inpatient visits during pregnancy reflect the undue burden of SCD during pregnancy.

Mon-46. Emergency contraception access in metropolitan and non-metropolitan pharmacies: An in-store analysis of stocking practices in Georgia

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Introduction: Oral emergency contraception (EC) prevents pregnancy up to 5 days after sex, and is most effective when taken as soon as possible. Levonorgestrel (LNG) EC may be sold directly to consumers without restrictions, ulipristal acetate (UPA) EC is prescription only. However, telephone mystery shopper data indicates consumers often face barriers accessing LNG and UPA EC in pharmacies.

Research Question or Hypothesis: Is oral EC readily available for consumers in Georgia community pharmacies, and are there differences in Metropolitan and Non-metropolitan counties?

Study Design: Prospective, cross sectional analysis.

Methods: Researchers visited community pharmacies in metropolitan and nonmetropolitan Georgia counties in Jul-Aug of 2022. Data collection included LNG location in the store (OTC, locked but on OTC shelf, behind counter), use of inappropriate age restrictions, and UPA availability. Descriptive statistics, chi-square test was conducted.

Results: 248 pharmacies (70.2% Metro, 29.8% Non-metro) were included in data analysis, of which 59.3% (58.6% Metro vs. 62.2% Non-Metro, p=0.65) did not have LNG on the OTC shelf. Of 101 stores that stocked LNG on the shelf, 70.3% (78.1% Metro vs. 50% Non-metro, p=0.01) restricted access (locked) in some way. Of the stores that did not stock EC on the shelf, 57.5% (59.8% Metro vs 50% Non-metro, p=0.38) had it in stock behind the counter. Of the 155 pharmacists responding, 28.4% endorsed inappropriate age restrictions (23.3% Metro vs 38.5% Non-metro, p=0.07). UPA EC was stocked in 7.22% (8.1% Metro vs. 5.1% Non-Metro, p=0.65) of pharmacies.

Conclusion: Georgia consumers still face barriers to EC access. Although LNG EC is available OTC without restrictions, most pharmacies did not have it on the OTC shelf, and those that did usually employed locks, particularly in Metro counties. Inappropriate age restrictions were imposed in a quarter of pharmacies. UPA EC was rarely available. Strategies to improve EC access, including unrestricted LNG OTC access, may help improve timely use and efficacy.

Tues-127. Impact of a Campus-Based Pharmacist Contraceptive Prescribing Service on Routine Preventative Care

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Introduction: Given the low rate of primary care utilization and the high need for contraception among 18-24 years olds, the Purdue University Pharmacy offers pharmacist contraceptive prescribing. Students meet with a pharmacist, and may receive a contraceptive prescription (pill, patch, ring, injection, gel, emergency contraception, diaphragm). Bundling contraceptive counseling, prescribing, and dispensing in a pharmacy reduces the burden of multiple visits for students. One criticism is the potential to miss recommended preventive screenings.

Research Question or Hypothesis: Why do students obtain contraception via the pharmacy? What is the actual and planned use of preventative services prior to, and following, pharmacy contraceptive prescribing?

Study Design: Prospective survey

Methods: Following their appointment (8/2022–5/2023), an optional 18-item survey evaluated why the patient saw the pharmacist for birth control, future plans to see their primary care provider, and receipt of preventative care in the past 2-3 years. A $5 incentive was provided. Descriptive statistics were done via Qualtrics.

Results: Thirty participants (18-34 years) completed the survey; all received contraception. Multiple reasons could be selected for seeking contraception at a pharmacy (n=91): convenient location (n=22, 24%), getting prescription faster (n=19, 21%), and saving money (n=14, 15%). Eleven (36.7%) received at least one preventive screening in the past 2-3 years: pap smear (n=5, 11.9%), breast exam (n=5, 11.9%), sexually transmitted infection testing (n=8, 19.1%), and pelvic exam (n=5, 11.9%). Six (20%) intended to see a primary care provider in the next 3 months, 9 (30%) within a year, and 5 (27%) in the next 3 years

Conclusion: Over 1/3 of students receiving a pharmacist contraceptive prescription reported at least one recommended screening. Most plan on seeing a provider within 3 years. Use of the pharmacy contraceptive prescribing service does not replace recommended care, and campus pharmacies may consider how to bundle recommended screenings with contraceptive prescribing services.

Sat-62. Evaluation of teaching and assessment methods of intimate partner violence content at Schools/Colleges of Pharmacy

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Introduction: Intimate partner violence (IPV) is an important public health issue. Recent studies have identified about 35% of women and 30% of men have experienced IPV. Literature characterizing the role of pharmacists and student pharmacists in identification and management of IPV is scant. Studies reveal many community pharmacists indicate no IPV training/education.

Research Question or Hypothesis: This study aimed to characterize teaching and assessment methods incorporated by schools/colleges of pharmacy to train student pharmacists for identification and management of IPV.

Study Design: Cross-sectional survey administered via REDCap web-based application.

Methods: A survey was sent to the American Association of Colleges of Pharmacy (AACP) Practice listserv to professor(s) at their institution teaching IPV-related topics to collect current IPV-related teaching and assessment methods, demographics, and awareness of respective state laws regarding pharmacists as mandatory IPV reporters. The data was analyzed using descriptive statistics. This study was approved by Midwestern University Institutional Review Board.

Results: Of 145 institutions, 164 responses were collected representing 86 institutions (59% school response rate). A total of 101 respondents (61.6%), were only either somewhat aware, slightly aware, or not at all aware of respective state laws requiring pharmacists to be mandatory reporters for IPV. IPV content was addressed by 24 respondents representing 20 institutions within didactic, elective, or experiential curriculum. Among the respondents, 17/24 (70.8%) used didactic lecturing, 6/24 (25%) used interprofessional education, and 14/24 (58.3%) used active learning to deliver IPV content. IPV content was assessed by 8/24 (33.3%) respondents through exam questions, 8/24 (33.3%) via observation, 3/24 (12.5%) via graded rubric, 6/24 (25%) by other methods, and 7/24 (29%) did not have an assessment.

Conclusion: IPV is not often included within required pharmacy curricula. A lack of IPV-related training for student pharmacists and inadequate awareness by pharmacists of state law requirements regarding IPV reporting warrants consideration for the addition of this topic to pharmacy school curricula.

R&S ACADEMY ORIG RESEARCH

Other

Sun-100. Self-Reflection Assessment for Improved Communication in First-Year Pharmacy Students

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Introduction: Per the 2016 Accreditation Council for Pharmacy Education guidelines, Doctor of Pharmacy (Pharm.D.) program graduates "must be able to effectively communicate verbally and nonverbally". Various training techniques can improve student communication skills. Student self-assessment is inherently subjective and requires systematic assessment to ascertain improvement. Authors created a three-pronged, semi-guided self-reflection tool for first-year Pharm.D. Candidates to self-assess their communication skills. This approach has not been discussed in pharmacy literature, to the best of our knowledge.

Research Question or Hypothesis: The use of a three-pronged self-reflection tool will increase communication skills for first-year Pharm. D. Candidates.

Study Design: Single-centered prospective cohort study evaluating quantitative and qualitative data for 168 students.

Methods: Students recorded a 10-minute counseling session with a partner. Students reviewed their recordings in a three-pronged approach [(audio only (non-verbal), video only (verbal), then audio and video (full communication)] and completed a Qualtrics survey self-assessing each of the defined areas. Faculty provided standard feedback via communication rubric. Students then recorded another counseling session. The primary outcome was change in communication grades and the secondary outcome was student-identified strengths and areas of improvement. Grades were compared via paired student t-test through R statistical software and Qualtrics student responses were categorized by theme.

Results: One hundred and sixty-seven students completed the self-reflection. For non-verbal communication, student-identified areas of improvement included eye contact, distracting body and hand gestures, and facial expressions. Non-verbal communication strengths identified included attentive listening, empathetic expression, and confidence. For verbal communication, student-identified areas of improvement included filler words, confidence in content, and utilizing the teach-back method. Verbal communication strengths identified included a logical conversation flow with communication at an appropriate patient level. Overall, average communication grades significantly improved from 76.9% to 88.9% after self-reflection and faculty feedback ($p<0.001$).

Conclusion: Use of a unique, three-pronged self-reflection tool, with standard faculty feedback, significantly increased communication skills for first-year Pharm.D. Candidates.

SYSTEMATIC REVIEWS/META-ANALYSIS

Ambulatory Care

Mon-27. Network Meta-Analysis of Long-Term SGLT2 Treatments on Safety and Cardiovascular Outcomes in High-Risk Individuals with Diabetes

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Background: This network meta-analysis evaluates the long-term safety and efficacy of SGLT2 inhibitors and placebo on serious and cardiovascular adverse events from outcome trials in individuals with diabetes at high-risk for cardiovascular events.

Methods: A comprehensive literature search was conducted in PubMed from January 2010 to December 2022 to identify randomized controlled trials with a follow-up period of two or more years. The search utilized generic terms for canagliflozin, empagliflozin,

dapagliflozin, and ertugliflozin. Trials focusing on heart failure, microvascular disease, or renal disease outcomes were excluded. Outcomes of interest included serious adverse events (SAEs) and cardiovascular adverse events (combined endpoint of CV death, myocardial infarction, and stroke). Three independent evaluators assessed risk of bias using the Cochrane Risk of Bias (RoB) tool. Frequentist and Bayesian network meta-analyses were employed for pair-wise comparisons of active treatment against placebo. Surface Under the Cumulative RAnking (SUCRA) values were calculated to rank the outcomes.

Results: Five trials involving 46,961 high-risk individuals with diabetes and minimal risk of bias were included. Canagliflozin and empagliflozin were associated with fewer SAEs compared to placebo in the frequentist analysis but not in Bayesian analysis. Canagliflozin and empagliflozin had the highest probability of success (fewer SAEs compared to placebo) according to weighted SUCRA rankings. Similar findings were observed for cardiovascular events, with canagliflozin and empagliflozin showing a significant reduction in events compared to placebo in the frequentist analysis and not replicated in Bayesian analysis. Canagliflozin and empagliflozin had the highest probability of success (fewer SAEs and cardiovascular outcomes compared to placebo) based on the weighted SUCRA rankings.

Discussion: Canagliflozin and empagliflozin were similarly ranked better than placebo in respect to SAEs and cardiovascular events in frequentist but not Bayesian analysis. High-risk patients may benefit from canagliflozin or empagliflozin treatment.

Other: This work was unfunded, non-registered and the authors have no potential conflicts of interest.

Cardiovascular

Sun-17. Antithrombotic therapy in patients after transcatheter aortic valve implantation: a network meta-analysis

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Background: The optimal regimen of antithrombotic therapy in adult patients who undergo transcatheter aortic valve implantation (TAVI) is unknown. We performed a systematic review/network meta-analysis to compare different anticoagulant/antiplatelet regimens. The primary outcome was all-cause death. Secondary outcomes were major adverse cardiovascular events (MACE) and major bleeding.

Methods: We searched MEDLINE, Embase, and CENTRAL from inception to April 2023. Included were randomized controlled trials that compared single antiplatelet therapy (SAPT), dual antiplatelet therapy (DAPT), or oral anticoagulant (OAC) therapy with/without SAPT, and reported one or more outcomes of interest. No language restrictions were applied. Quality assessments were performed using the Cochrane risk-of-bias tool 2. Bayesian network meta-analyses were performed to compare all interventions simultaneously using the Markov-chain Monte Carlo method with median ranking. Odds ratios (OR) with 95% credible intervals (CrI) were generated using a hierarchical Bayesian framework and random-effects model with informative priors.

Results: From 262 citations, 11 RCTs (N=6415) were included. Median age was 81 years. Median follow-up was 6 months. Compared to DAPT, DOAC+SAPT had a higher risk of all-cause death (OR 1.77, 95% CrI 1.15-2.75) with no difference between DAPT and SAPT (OR 0.99, 95% CrI 0.58-1.66). DOAC+SAPT increased the risk of major bleeding compared to DAPT (OR 2.18, 95% CrI 1.09-4.54), while SAPT lowered the risk (OR 0.41, 95% CrI 0.19-0.84). There was no difference in MACE between DAPT and other regimens. SAPT ranked best for all-cause death, MACE, and major bleeding.

Discussion: In post-TAVI patients, SAPT may provide the optimal balance of reducing thrombotic events while minimizing risk of bleeding. Overall risk of bias was low or with some concerns. This network meta-analysis used widely-accepted methodology and standardized outcome definitions. There remains a need for an adequately-powered trial to compare SAPT and DAPT.

Other: This study was unfunded. The authors disclose no conflicts of interest. PROSPERO registration number CRD42021251819.

Mon-36. Systematic review of apixaban efficacy and safety in atrial fibrillation (AF) or venous thromboembolism (VTE) in patients with obesity

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Background: Direct oral anticoagulants (DOACs) have robust evidence in atrial fibrillation (AF) and venous thromboembolism (VTE). Recent guidance suggests preserved efficacy and safety in obesity. However, DOAC use in this population has not been broadly adopted due to sparse data. While increased body weight (BW) showed modest effects on apixaban's pharmacokinetics, its efficacy and safety in AF and VTE are not well understood. We conducted a systematic review of published randomized controlled trials (RCTs) and observational studies (real world data (RWD)) to characterize the effects of apixaban in obese patients.

Methods: Using natural language processing (NLP) to text mine PubMed records from January 2021 through June 2023, we identified RCTs and RWD studies comparing apixaban to other OACs, with or without warfarin as an additional comparator, in patients with obesity and comorbid AF or VTE. We then reviewed in detail publications providing BMI or weight categories, which assessed BW's impact on safety, efficacy, and effectiveness. We excluded duplicates, pooled

DOAC analyses, review articles, systematic reviews, metanalyses not reporting apixaban-specific data, preclinical and case studies, commentaries, editorials, and letters. Relative to manual PubMed searches, NLP mitigates the risk of bias.

Results: 238 publications were identified by NLP. 166 were reviewed in detail for inclusion. 40 publications met all inclusion criteria: 11 meta-analyses, 4 RCTs, and 25 RWD studies. No RCT demonstrated an interaction between BW and treatment for efficacy or safety. Similarly, effectiveness and safety in all RWD were consistent across BW groups. Details of these analyses (including BMI > 40 and >50 kg/m2 cohorts) will be presented.

Discussion: RCT and RWD suggest obesity minimally impacts apixaban's efficacy, effectiveness, and safety in AF or VTE. Apixaban's benefit-risk profile appears similar in those with and without obesity. Further studies in morbid obesity are needed.

Other: Sponsored by BMS and Pfizer.

Hematology/Anticoagulation

Sun-75. A Systematic Review of Therapeutic Enoxaparin Dosing in Class III Obesity

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Background: Data are variable regarding ideal weight-based dosing of therapeutic enoxaparin in class III obesity. This systematic review compared weight-based dosing categories in obese patients to determine likelihood of goal anti-Xa level achievement.

Methods: A systematic review of English language studies using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was conducted. Articles were identified via Pubmed and EMBASE searches. Included studies reported therapeutic enoxaparin use in adult patients with a body mass index of at least 40 kg/m^2 or body weight greater than 100 kg and the percentage of patients achieving a therapeutic anti-Xa based on a weight-based dose. Therapeutic attainment of anti-Xa levels were assessed across enoxaparin weight-based dosing categories including a significantly reduced dose group: < 0.75 mg/kg, reduced dose group: 0.75-0.85 mg/kg, and standard dose group: > 0.95 mg/kg. Rates of bleeding and thrombosis were also evaluated. Results were described descriptively due to study heterogeneity.

Results: Eight studies were included, seven retrospective and one prospective. For anti-Xa level assessment, 518 patients were included. In the significantly reduced dose group, 62% of anti-Xa levels were therapeutic, 66% in the reduced group, and 43% in the standard dose group. The rates of bleeding and thrombosis were assessed in 798 patients. Twenty-nine bleeds (3.6%) occurred. A majority of the bleeds (85.2%) occurred in patients receiving standard weight-based dosing (> 0.95 mg/kg). Thrombosis occurred in 5 patients (0.6%).

Discussion: This evidence demonstrates the potential for improved achievement of anti-Xa levels with reduced weight-based dosing of enoxaparin, but it is important to note that most data is drawn from retrospective studies. However, based on this data it is reasonable to use a reduced dose of enoxaparin in obese patients requiring therapeutic anticoagulation.

Other: No conflicts of interest or funding.

Infectious Diseases

Tues-76. The efficacy and safety of Bamlanivimab/ Etesevimab against SARS-CoV-2 infection:A Systematic Review

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Background: Due to the lack of evaluation of its efficacy and safety, we reviewed the role of BAM/ETE during the SARS-CoV-2 epidemic systematically.

Methods: Pubmed, Embase, and Cochrane databases from inception to January 20, 2023 were searched. RCTs and controlled clinical trials (CTs) were included.The quality were assessed by Cochrane Handbook, the Jadad and Newcastle Ottawa scale. The systematic review was conducted via Revman 5.4 and STATA 12.

Results: A total of 10 trials (5 RCTs and 5 CTs) and 15139 adult patients with mild to moderate disease were included. The quality of trials is acceptable,but publication bias exists.Compared with placebo, the odds of COVID-19-related hospitalization, emergency department visit, and death were lower in BAM/ETE group(pooled RR = 0.27, 95% CI [0.16-0.45]),with good safety profile. The trial sequential analysis suggested this result was stable. The differences of common ADEs odds were not found between BAM/ETE and placebo via Chi-square test. In RCTs, BAM/ETE was as effective as Casirivimab/Imdevimab (CAS/IMD) on hospitalization and all-cause mortality. But in CTs, it was associated with higher hospitalization rate.The study type was an important source of heterogeneity of hospitalization (P=0.034) via meta-regression analysis. The incompatibility of patients was considered as an important factor.In the case of safety profile, BAM/ETE was comparable to the other monoclonal antibodies.In subgroup analysis of different virus strains, the efficacy of BAM/ETE was similar to CAS/IMD and Sotrovimab.

Discussion: In general, BAM/ETE is effective and safe analogous to CAS/IMD and SOT. However, new well-designed trials (especially RCTs) should be conducted. In addition, more confirmation should be provided on whether it is effective to Omicron in vivo. Thus, the research of BAM/ETE should not be interrupted, but enter a new stage with the coordination of an international institution which can control the trial homogeneity among various trials to save research resources.

Other: No funding supported

Nephrology

Sun-92. Network Meta-Analysis on the Effects of Mono- or Dual Therapy with SGLT2 Inhibitors, GLP1 Agonists, and Finerenone on Renal Outcomes in Patients with Diabetic Kidney Disease

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Background: Sodium-glucose co-transporter 2 inhibitors (SGLT2I), glucagon-like peptide-1 receptor agonists (GLP-1RA), and finerenone have shown renoprotective effects in patients with diabetic kidney disease (DKD). However, the combination effects of these agents have not been established. This network meta-analysis (NMA) was to compare the effects of combination therapy using these agents with monotherapy in DKD patients.

Methods: PubMed, EMBASE, and CENTRAL were searched up to May 1, 2023 to identify randomized controlled trials comparing the kidney outcomes of SGLT2I, GLP1RA, or finerenone as mono- or combined therapy with placebo in DKD patients. Therapy with finerenone +SGLT2I, finerenone+GLP1RA, SGLT2I, GLP1RA, finerenone, and placebo were analyzed. Trial quality was assessed using Cochrane risk-of-bias tool. Primary outcomes were kidney composite outcome and discontinuation due to adverse effects (AE). Secondary outcomes were urinary-albumin-creatinine ratio change, glomerular filtration rate slope, and safety outcomes. Frequentist NMA was performed and therapies were ranked with P-score.

Results: A total of twenty-four trials (n=51,508) were included. From 19 trials (n=34,402), finerenone+SGLT2I was more effective to reduce the risk of kidney composite outcome than SGLT2I (hazard ratio [HR] 0.42; 95% confidence interval [CI] 0.14–1.26), finerenone +GLP1RA (HR 0.39; 95% CI 0.11–1.43), finerenone (HR 0.35, 95% CI 0.11–1.05), GLP1RA (HR 0.32, 95% CI 0.11–0.99), or placebo (HR 0.27, 95% CI 0.09–0.82) (in P-score order). Discontinuation due to AE was fewer with finerenone+SGLT2I than SGLT2I (odds ratio [OR] 0.78, 95% CI 0.41–1.46), placebo (OR 0.74, 95% CI 0.39–1.42), finerenone (OR 0.62, 95% CI 0.32–1.20), GLP1RA (OR 0.17, 95% CI 0.07–0.42), or finerenone+GLP1RA (OR 0.14, 95% CI 0.05–0.40) (in P-score order).

Discussion: In this NMA, finerenone+SGLT2I therapy was better to reduce the risk of kidney events and better tolerated than monotherapy or finerenone+GLP1RA in DKD patients. However, due to a limited number of finerenone trials included, further studies are warranted.

Other: No funding/conflicts of interest. Registered at PROSPERO (CRD42023382484).

Pain Management/Analgesia

Sun-95. Evaluating Adverse Drug Effects of Multi-Modal Analgesics in Non-Intubated, Critically Ill Patients:A Systematic Review of the Literature

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Background: Multi-modal analgesic regimens have the potential to deliver opioid-sparing pain management. While their efficacy has largely been established, the impact of adverse drug effects (ADEs) associated with this analgesic strategy have not been fully investigated.

Methods: A systematic review was conducted in Embase, MEDLINE (PubMed), Cochrane CENTRAL, and Web of Science, SciELO, and Korean Citation Index (Clarivate) on 6 February 2023. Bias was evaluated using the Cochrane Risk of Bias tool. Studies documenting an ADE associated with a non-opioid medication used as an analgesic in conjunction with an opioid in non-intubated intensive care patients were included.

Results: Ten randomized control trials were included in the qualitative synthesis after 961 records were assessed for eligibility. Medications evaluated included acetaminophen, lidocaine, dexmedetomidine, gabapentin, pregabalin, carisoprodol, ketorolac, ibuprofen, and ketamine. All but three of the evaluated trials used >1 adjunctive analgesic as part of a comprehensive pain management regimen. None of the trials documented a clinically significant increase in the incidence of adverse drug effects versus their comparator groups. The ADEs evaluated aligned with the contributing medications: Ketamine was associated with mental status changes, IV lidocaine with urinary retention, and gabapentin with dizziness.

Discussion: The findings of this review support the safety of using multi-modal analgesic strategies, and can be further extrapolated to endorse the use of multiple adjunctive agents simultaneously to safely deliver an adequate pain management regimen. The inability to quantify the effects of a single adjunctive agent's safety profile is a

limitation, however; the lack of identified differences in the ADE incidence rate obtained from the primary literature make it reasonable to consider them safe for the vast majority of patients.

Other: None of the authors have any relevant conflicts of interest to disclose.

Pediatrics

Mon-111. Comparative efficacy and safety of glucagon-like peptide-1 receptor agonists in children and adolescents with obesity or overweight plus diabetes: A systematic review and network meta-analysis

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Background: Numerous glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have been used in children and adolescents with obesity or overweight plus diabetes. However, it remains unclear which GLP-1 RAs are the most effective and safe.

Methods: We searched PubMed, Scopus, and Embase up to March 10, 2023. Randomized controlled trials (RCTs) comparing the effects of GLP-1 RAs to placebo or other treatments in children and adolescents with obesity or overweight plus type 2 diabetes were included. The primary efficacy outcomes were mean changes in weight, waist circumference, BMI, and BMI z score. Safety outcomes included the incidence of nausea, vomiting, diarrhea, abdominal pain, and hypoglycemia. Cochrane Collaboration's tool for randomized trials assessed the risk of bias. Mean differences (MDs) and 95% credible intervals (CIs) were reported. Different treatments were ranked using the surface under the cumulative ranking (SUCRA) probabilities.

Results: Eleven RCTs enrolling 953 participants (mean age 14.7 years; 38% male; baseline weight 100 kg, and BMI 35.8 kg/m2) were eligible, evaluating the effects of semaglutide, dulaglutide, liraglutide, and exenatide. Eight studies included obese patients, while three enrolled overweight adolescents with type 2 diabetes. Semaglutide showed the greatest reductions in weight (MD -17.67 kg, 95% CI -23.18 to -12.37), BMI (MD -5.99 kg/m2, 95% CI -9.36 to -2.72), and BMI z score (MD -1.00, 95% CI -1.54 to -0.46) versus placebo. SUCRA values indicated that semaglutide was more effective than other GLP-1 RAs (weight 99.9%; waist circumference 93.0%; BMI 98.0%; BMI z score 98.9%). Safety of liraglutide was the poorest among all GLP-1 RAs (nausea 76.8%; vomiting 66.4%; diarrhea 81.5%; hypoglycemia 73%; abdominal pain 73.5%).

Discussion: Current evidence suggests that semaglutide appears to be the most effective and safe pharmacotherapy option among four GLP-1 RAs in children and adolescents with obesity or overweight plus diabetes. Direct comparative studies between different GLP-1 RAs are needed.

Other: None

Pharmacoepidemiology

Sun-115. Risk of bladder cancer associated with sodium-glucose cotransporter-2 (SGLT-2) inhibitors: A systematic review

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Background: Previous randomized controlled trials of sodium-glucose cotransporter 2 (SGLT-2) inhibitors have reported a numerical imbalance of bladder cancer events among patients randomized to dapagliflozin and empagliflozin. However, it remains unclear whether the imbalance is a result of chance or is related to the carcinogenic effects of these medications. To assess the risk of bladder cancer among patients using SGLT-2 inhibitors, we conducted a systematic review of observational studies.

Methods: We screened PubMed and Embase up until May 2023 using the keywords 'SGLT-2 inhibitors' and 'bladder cancer'. Studies were eligible if they are observational studies that investigated the risk of bladder cancer among patients with SGLT-2 inhibitors, regardless of the comparator drug. We used the Joanna Briggs Institute critical appraisal checklists to evaluate the methodological quality of each study.

Results: We included two cross-sectional studies and three retrospective cohort studies, involving a total of 41,512,603 patients. The cross-sectional studies, conducted using nationwide pharmacovigilance databases, employed disproportionality analysis. Both studies identified a disproportionately high number of bladder cancer cases among SGLT-2 inhibitors users compared to non-users, suggesting a safety signal. Conversely, the cohort studies, which compared SGLT-2 inhibitors with dipeptidyl peptidase 4 inhibitors, glucagon-like peptide-1 receptor agonists or other anti-diabetic drugs, found no significant increase in the risk of bladder cancer. Importantly, these studies had a median follow-up range of 1.5 to 3 years. All studies were rated as good quality.

Discussion: The disproportionality signal identified from the pharmacovigilance databases is useful in generating safety signal but cannot establish causality. Consistent with a recent meta-analysis of randomized-controlled trials, our included cohort studies did not show an increased risk of bladder cancer associated with SGLT-2 inhibitors. However, the follow-up period of three years was insufficient to evaluate potential carcinogenic effects. Further studies with longer follow-up periods are warranted.

Other: Funding: None. Conflicts of interest: None. Registration: None.

Pharmacogenomics/Pharmacogenetics

Sat-51. The Association between DNA Repair Genes Polymorphisms and Cisplatin Induced Ototoxicity in Cancer Patients. A Systematic Review

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Background: Ototoxicity is considered as the dose limiting toxicity of cisplatin. Several DNA repair genes polymorphisms have been investigated for their association with cisplatin induced ototoxicity (CIO). However, the predictive value of these genetic variants is controversial. The aim of this study is to systemically review the literature pertaining to the potential genetic predisposition of DNA repair genes polymorphisms with CIO.

Methods: PubMed, SCOPUS, web of science and trial registries were searched, we also extensively searched grey literature including OpenGrey, Web of Conferences and ProQuest Dissertations and Thesis Global. Moreover, we identified other potentially eligible studies by searching the reference lists of included studies. Q-genie tool was used for quality assessment. The systematic review was reported according to PRISMA guideline.

Results: Eight studies were deemed eligible with a total of 672 subjects. The eight included studies investigated the association of CIO with nine DNA repair genes (XPA, XPC, ERCC1, ERCC2, XRCC1, EX01, ERCC4 and ERCC5). The total number of SNPs investigated were 96 SNPs among them 54 SNPs were of DNA repair genes. Among all SNPs studies, AC+CC genotypes of XPC rs2228001 was found to have otoprotective effect with decreased risk of CIO with OR 0.20 (0.06-0.70), P: 0.01. While the highest OR for increased CIO was identified when XPC rs2228001 was analysed in combination with SNPs in GSTP1, FASL or MSH3 genes with OR of 32.22, 22.29 and 17.09 respectively.

Discussion: Several DNA repair genes polymorphisms and their associations with CIO have been explored in multiple studies. However, the findings are inconsistent and limited by the specific populations and SNPs studied in each article. More studies with larger sample sizes and standardized methodologies are needed to validate these findings and identify potential genetic markers that may aid in identifying patients who are at a higher risk of developing CIO.

Other: None

Pharmacokinetics/Pharmacodynamics/Drug Metabolism/Drug Delivery

Sun-119. Systematic Review of Sex-Based Differences in Vortioxetine Pharmacokinetics

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Background: Vortioxetine has a multimodal action to treat major depression. In terms of its pharmacokinetics, little is known about subject-related intrinsic factors (e.g., sex). This study aims to determine whether sex affects vortioxetine pharmacokinetics in healthy men and women.

Methods: RCTs with sex-specific subgroup analyses were eligible. Risk of bias was assessed using the RoB 2 Cochrane Tool. To identify relevant articles and studies, PubMed, Embase, Cochrane, and Clinicaltrials.gov were searched. Vortioxetine pharmacokinetics and adverse events were the primary endpoints.

Results: Inclusion criteria were met by three studies. Following a single dose, women were exposed to vortioxetine more than men. Steady-state data showed similar trends. Men and women received different dose ranges. However, the pharmacokinetics were linear across all dose ranges. The difference between men and women in exposure (Cmax and AUC) was statistically significant, despite no clinically relevant differences. Vortioxetine exposure is significantly related to body weight and other size-related measurements, such as body mass index and lean body mass. Most commonly reported adverse events were nausea and headache; women reported nausea more than men.

Discussion: FDA drug labels did not differentiate between sexes for indications despite differences in pharmacokinetics. This variability has a sex-specific explanation, but there are significant gaps in our knowledge. This review has the advantage of using global vortioxetine data. The variability observed in the studies could not be comprehensively evaluated due to limited background information.

Other: Pharmacokinetic model-based studies are needed for both sex-specific and non-sex-specific changes in adult populations.

Women's Health

Sat-63. Systematic review of non-hormonal selective neurokinin-3 receptor antagonists for the management of vasomotor symptoms of menopause

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Background: Vasomotor symptoms (VMS) affect many postmenopausal persons and impact sleep and quality of life. This systematic review examines the safety and efficacy of non-hormonal selective neurokinin-3 receptor (NK3R) antagonists approved and in development for persons with VMS.

Methods: A search of Medline and Embase was conducted using the search terms and permutations of NK3R antagonist, elinzanetant, fezolinetant, and osanetant. Inclusion criteria were: reporting on efficacy or safety of fezolinetant, elinzanetant, or osanetant; studies in participants identifying as female; full record in English; and, primary literature. Abstract-only records were excluded. Extracted data were synthesized to allow comparison of reported study characteristics, efficacy outcomes, and safety events. Eligible records were evaluated for risk of bias (ROB) via the Cochrane Risk of Bias 2 tool for randomized studies and the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system was used.

Results: The search returned 191 records; 186 were screened after deduplication. Inclusion criteria was met by five randomized controlled trials (RCTs), three reported on fezolinetant and two reported on elinzanetant. One record was a post-hoc analysis of a fezolinetant RCT. The three fezolinetant RCTs demonstrated a reduction in VMS frequency/severity, improvement in Menopause-Specific Quality of Life (MENQoL) scores, and improvement in sleep quality at weeks 4 and 12 compared to placebo without serious adverse events. The two RCTs on elinzanetant also showed improvements in VMS frequency and severity. All six records evaluated safety through treatment-emergent adverse events; the most common adverse events were headache, somnolence, and gastrointestinal. Each record evaluated had a low ROB. There is a strong certainty of evidence as per the GRADE system.

Discussion: Due to the high-quality evidence supporting the efficacy of fezolinetant and elinzanetant, these agents may be an effective option with mild adverse events for patients seeking nonhormonal treatment of VMS.

Other: This study was neither funded nor registered.