Scientific Abstracts from The Pediatric Pharmacy Association Annual Meeting April 2025

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ANALYZING PEDIATRIC AND NEONATAL VANCOMYCIN DOSING AND MONITORING FOR INSTITUTIONAL GUIDELINE UPDATES. Marta Galagoza, Suzannah Kokotajlo, Christine Robinson. Atlantic Health System.

Introduction: Vancomycin dosing and monitoring in pediatrics and neonates have limitations, including therapeutic failures and lack of clinical data demonstrating vancomycin pharmacokinetic goals. Recent studies have shown that vancomycin dosing regimens for infants vary worldwide and that target antibiotic concentrations occur in only 25-41% of infants. The purpose of this study is to update the current institutional pediatric intravenous vancomycin guidelines and guide appropriate interval dosing for neonatal and adolescent populations.

Methods: This study was a retrospective chart review of patients admitted to the general pediatric floor, neonatal intensive care unit, and pediatric intensive care unit from January 1, 2023 to December 31, 2023, receiving intravenous vancomycin. The primary objective includes assessing the current empiric intravenous vancomycin ordering practice with respect to age ranges and to update the current institutional pediatric intravenous vancomycin guidelines.

Results: 150 patients were analyzed with 56% males, mean age of 7.4 years and weight of 29.8 kg. All patients had stable baseline serum creatinine with 50.7% admitted to the general pediatric floor, 40.7% in the pediatric intensive care unit, 6.7% in the neonatal intensive care unit and 2% from the pediatric emergency department. Vancomycin was indicated for the following infections: respiratory (27%), bloodstream (22%), meningitis/CNS (17%), fever/source unknown (16%) and skin/soft tissue (10%). Other indications include (history of MRSA, orbital cellulitis). The average days on vancomycin was 3.5 and 4.8 overall for those with susceptibilities favoring vancomycin, respectively 51% of cultures had growth but only 22% favored vancomycin use. On average, 1.5 troughs were drawn per patient with an average level of 14 mg/L. In patients greater than or equal to 13 years of age, 7 patients had supratherapeutic troughs (greater than 20 mg/L) with 71.4% of these troughs occurring while on every 6-hour dosing interval. A subgroup analysis conducted on the neonatal intensive care population determined that all patients received a 15 mg/kg dose with one incidence of a supratherapeutic trough. All dosing was correct as per NeoFax vancomycin dosing recommendations. No episodes of acute kidney injury while on intravenous vancomycin were found.

Conclusion: Vancomycin was commonly prescribed as 15 mg/kg weight-based dose every 6 hours on the pediatric unit. Based on patients greater than or equal to 13 years of age, a majority of supratherapeutic troughs occurred on a every 6 hours interval which may support initiating every 8-hour interval dosing regimens specifically in this population. All neonatal vancomycin dosing followed NeoFax recommendation. The future directions include presenting these results to the pediatric hospitalists, intensivists and infectious disease team to develop an age-appropriate vancomycin dosing guideline.

BRIDGING THE GAP: A NEEDS ASSESSMENT TO ENHANCE PEDIATRIC PRECEPTOR DEVELOPMENT. Pooja Shah, Danielle Alm. Ernest Mario School of Pharmacy at Rutgers, The State University of New Jersey.

Introduction: Recommendations for developing pediatric pharmacy competency within pharmacy schools are dispersed across various literature sources. Most recently, a joint statement on pediatric education at schools of pharmacy strongly recommends that each PharmD student complete at least one pediatric-focused advanced pharmacy preceptor experience (APPE). Previous studies have indicated that while 97% of pharmacy schools have offered APPE experiential, only one-fifth of students have completed them and only 61% of schools have a pediatric elective offered. Preceptor development topics specific to improve pediatric pharmacy education can strengthen the didactic or experiential learning experience and potentially enable preceptors to host and teach learners more effectively. To address the needs of pediatric pharmacists, the Pediatric Pharmacy Association (PPA)' academia Special Interest Group (SIG) conducted a needs assessment to inform the development of preceptor development opportunities. This survey was conducted to gain a better understanding of the needs of our pediatric pharmacist preceptors with regard to preceptor development opportunities.

Methods: In December 2024, an 8-question survey was distributed by email to all the PPA members.

Results: Fifty-six members responded to the needs assessment. Demographic data revealed that clinical preceptors comprised the largest group (64%, n=35), followed by full-time faculty (n=15). A significant majority (76%) had been in practice forever six years. A strong interest (75%) in attending professional development activities was expressed. Regarding learner types, 87% precept students, 85% precept PGY1 learners, and 58% precept PGY2 learners. The number of learners precepted varied considerably, with student learners ranging from 1-3 per rotation and 1-20 per year. Only two preceptors reported taking more than one PGY1 resident per year, and none took more than one PGY2 learner per rotation. Among the topics offered, the four most popular (selected by >50% of respondents) were "Innovations in teaching strategies," "Integration of technology in teaching,"

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"Pediatric research and publication guidance," and "Effective mentorship and student engagement."
Conclusions: Pediatric pharmacists are involved in educating learners experientially and are interested in preceptor development opportunities. The Academia Sig will use these results to host a series of topics for the PPA membership.

CHARACTERIZATION OF ANTITHROMBIN III USE IN INFANTS ON ECMO. Belyin Gutierrez Euceda, Caitlin Murtagh, Densley Perez. NewYork-Presbyterian Hospital.
Introduction: Extracorporeal membrane oxygenation (ECMO) is used to support infants with cardiac or respiratory failure. Heparin, an anticoagulant that potentiates the endogenous anticoagulant antithrombin III, is the anticoagulant of choice for ECMO due to low cost, short half-life, and reversibility. However, antithrombin III levels in infants are normally reduced due to an underdeveloped coagulation system leading to a diminished effect of heparin to provide adequate anticoagulation. Antithrombin III supplementation can increase the likelihood of attaining a therapeutic anti-Xa level. The current literature offers mixed results regarding the effect of antithrombin III on rates of thrombosis, bleeding, heparin dose, and therapeutic anti-Xa level attainment. The purpose of this study is to characterize the use of antithrombin III supplementation and determine its impact on heparin in infants on ECMO.
Methods: This was a single center retrospective cohort study evaluating the current prescribing practices of antithrombin III in infants (less than 1 year old) on ECMO between February 2020 and September 2024. Exclusion criteria included discontinuation of ECMO within24 hours of cannulation or dose of antithrombin III, heparin indication not anticoagulation, and antithrombin III given greater than 7 days after initial ECMO cannulation. The main outcomes were to evaluate incidence of antithrombin III usage, antithrombin III regimen used, change in heparin infusion rate (units/kg/hour) and antithrombin III level pre- and post-antithrombin III dose, and therapeutic anti-Xa level attainment. Other outcomes included survival and complications such as stroke, hemorrhage, and thrombosis.
Results: A total of 77 subjects were included in this study. Most subjects were less than 6months old with median weight of 3kg. Antithrombin III was given in 23 of the 77 subjects. Median baseline antithrombin III level in the non-antithrombin III and antithrombin III groups were 35% and 25%, respectively (p=0.06) with an increase in level seen in all patients who received antithrombin III. The median dose of antithrombin III was 200 units. The median heparin infusion rate pre- antithrombin III was 28 units/kg/hour and the maximum rate was 40units/kg/hour post-antithrombin III. A therapeutic anti-Xa level was achieved in 100% and 83.8% (p=0.051) in the antithrombin III and non-antithrombin III subjects, respectively. The most common complication was hemorrhagic in both groups with no significant differences in survival.
Conclusions: This study demonstrated that subjects that received antithrombin III had a lower baseline antithrombin III level. All subjects who received antithrombin III attained therapeutic anti-Xa levels while there was a portion of those who did not achieve therapeutic levels without antithrombin III. Regardless, subjects on antithrombin III required almost double the initial heparin rate to become therapeutic reflecting the difficulty in attaining therapeutic anti-Xa levels in this patient population.

EVALUATION OF DEXMEDETOMIDINE USE IN A TINY BABY UNIT (TBU) WITHIN A LEVEL IV NEONATAL INTENSIVE CARE UNIT (NICU). Jillian Garrett, Britany Walls, Madeline O'Bryan. Norton Children's Hospital
Introduction: Dexmedetomidine (DEX) use for pain and sedation has increased in the neonatal population over the past decade (1). Increased use is attributed to its preferable side effect profile and potential to decrease opioid and benzodiazepine requirements (2, 3). Benzodiazepine (BZD) use in neonates may be a risk factor for poor neurodevelopmental outcomes with neuronal apoptosis during brain development, which has not been shown with DEX use (4). Consequences of inadequate sedation and analgesia in this population include metabolic stress, altered pain response over time, and increased morbidity and mortality (5). However, few studies have described sedation requirements of very-low birthweight (VLBW) neonates with DEX (6). The aim of this study is to characterize the use of DEX in preterm infants with birth weight (BW) less than 1250 grams in a tiny baby unit (TBU).
Methods: This is a retrospective study of DEX use in a newly formed TBU within our Level IV NICU from April 1, 2024 to August 4, 2024. Patients were included if they were admitted to the TBU, initiated on DEX, and had a BW of less than 1250 grams. Variables of interest included NICU length of stay (censored at 9/30/24), duration of mechanical ventilation, unplanned extubation occurrences, length of DEX therapy, DEX dosing range, and concurrent use of opioids, benzodiazepines, inotropes, and/or need for clonidine. Descriptive statistics were used to characterize DEX use among included patients.
Results: During the study period, 25 patients of 43 total admissions to the TBU received DEX. The study group had a median (IQR) BW of 700 (549 to 795) grams and a median (IQR) gestational age of 25 (23.5 to 26.5) weeks. The median (IQR) NICU length of stay was 119 (75 to 160.5) days. All 25 patients required mechanical ventilation. Mortality occurred in four patients (16%). DEX was started on median (IQR) day of life seven (2 to 11) and the median (IQR) duration of therapy was 30 (8 to 48) days. Clonidine was required to aid weaning of DEX in 40% of the study group.
Conclusion: Over half of all patients admitted to our TBU received DEX therapy for sedation. Our median duration of DEX therapy is 30 days, which is longer than previous reports from other institutions (6). This increase in duration may contribute to the high rate of clonidine utilization for weaning DEX seen in our study population. All patients included in this study required mechanical ventilation. This is not believed to be directly related to the use of DEX, but rather an expected complication of early GA and ELBW infants.

EVALUATION OF INTRAVENOUS SODIUM FERRIC GLUCONATE ADMINISTRATION IN PEDIATRIC PATIENTS WITH IRONDEFICIENCY ANEMIA. Patricia Rodriguez, Michelle Perez, Rosemary Sampedro. Holtz Children's Hospital.
Introduction: Iron deficiency is one of the most common causes of anemia worldwide, frequently affecting hospitalized pediatric patients. Risk factors include decreased iron intake, malabsorption, and acute or chronic inflammatory states. Intravenous (IV) iron administration is recommended when oral supplementation has proven ineffective, suboptimal response is expected, or rapid hematologic response is required. There

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are several IV iron formulations available, however, limited pediatric experience and shortages affect product selection. Sodium ferric gluconate (SFGC) is approved for use in pediatric patients 6 years and older on hemodialysis. Data remains limited in younger and non-hemodialysis patients. The purpose of this evaluation was to assess the safety and efficacy of SFGC in pediatric patients with iron deficiency anemia (IDA) at Holtz Children's Hospital (HCH).

Methods: This study was a single-center, retrospective, chart review conducted from July 1, 2022 to September 30, 2024. Pediatric patients with IDA who received SFGC at HCH were included. Data was collected via electronic medical records and included patient demographics, iron studies, complete blood count, and dosing.

Results: Forty patients and 139 orders were included in this analysis. Patient's age ranged from 1 to 18 years (mean, 9 years) at the time of administration; thirteen were younger than 6 years (32.5%). Of the patients included, five were on hemodialysis (12.5%). The most common indication for SFGC administration was intestinal transplant (39.5%) and the most common prescribing service was gastrointestinal solid organ transplant (48.9%). Average dose was 1.5 mg/kg (range, 1 to 3 mg/kg); total cumulative dose average was 5 mg/kg (range, 1 to 22 mg/kg). Patients received an average of five doses. Pre and post infusion hemoglobin and mean corpuscular volume (MCV) was collected for 61 patients (44%) with an average change of 0.1 g/dL and 1.5 fL, respectively. Pre and post infusion change in serum iron and ferritin was collected for nine patients (6.4%) with an average change of 12.3 mcg/dL and 6 ng/mL, respectively. One anaphylactic event was documented in a 13-year-old, while no other adverse effects were observed throughout the study period.

Conclusion: Our results showed that administration of SFGC was well tolerated in pediatric patients with IDA. Additionally, our analysis revealed that the most frequent dosing strategy was weekly doses of 1.5 mg/kg. There was no significant change in hemoglobin or MCV after SFGC administration. Future studies are needed to determine optimal dosing and efficacy in non-hemodialysis pediatric patients with IDA.

EVALUATION OF NIRSEVIMAB ADMINISTRATION IN A CHILDREN'S HOSPITAL. Lauren Deck. SUNY Upstate Golisano Children's Hospital.

Introduction: Nirsevimab (Beyfortus) was released onto the US market in 2023 for the prevention of respiratory syncytial virus (RSV) in infants and children less than 24 months old. With the second season of RSV after nirsevimab introduction starting fall 2024 we wanted to characterize how frequently we will or could be immunizing infants less than 8 months old with nirsevimab while they are admitted at Upstate Golisano Children's Hospital.

Methods: Pediatric patients less than 8 months old admitted to Upstate Golisano Children's Hospital were reviewed and a chart note was placed if they qualified to receive nirsevimab administration during their hospital admission. As part of their normal clinical workflow, a pharmacist reviewed if nirsevimab was already administered previously or whether the infant's mother was appropriately administered Abrysvo during pregnancy by accessing the New York State Immunization Information System database and using Epic data. This study was a retrospective review of pharmacist interventions. All data was collected via REDCap without patient identifiers. Collected data included patient age, patient gestational age at birth, month of admission, reason for admission, respiratory panel results, previous nirsevimab administration, previous maternal Abrysvo administration, whether nirsevimab administration was recommended during hospital admission, and whether nirsevimab was administered during hospital admission. The primary outcome was the frequency of infants less than 8 months old whom it was recommended to receive nirsevimab during hospital admission. Secondary outcomes included percentage of those patients whom received nirsevimab during admission, trends by month of admission, frequency of previous nirsevimab administration prior to admission, frequency of maternal Abrysvo administration during pregnancy.

Results: Thus far 102 infants age less than 8 months were reviewed. Of those 102 infants, 54 infants (52.9%) qualified to receive nirsevimab during admission. Seventeen (31.5%) of those 54 infants received nirsevimab during admission. Trends by month of admission cannot be assessed at this time. Thirty-seven (36.3%) infants had already received nirsevimab prior to admission and 12 (11.8%) of infant mothers reported receiving the Abrysvo vaccine during pregnancy with 1 receiving Abrysvo too close to delivery to preclude the infant from receiving nirsevimab.

Conclusion: Thus far over 50% of infants less than 8 months old admitted to our hospital were eligible to receive nirsevimab during admission and over 30%of those patients went on to actually receive it prior to discharge. These outcomes support the continued need to keep nirsevimab on hand at our institution and additionally support pediatric pharmacist involvement in vaccinating children while admitted.

IVABRADINE USE FOR ARRYTHMIAS IN CHILDREN. Katy Stephens, Jamie Miller, Monica Le, David Foote, David Foote, Peter Johnson. Oklahoma Children's Hospital at OU Health

Introduction: Ivabradine is an inhibitor of hyperpolarization-activated cyclic nucleotide-gated channels (f-channels) in the sinoatrial node. It has a labeled indication for dilated cardiomyopathy in adults and children but has been used off-label for refractory arrhythmias. The purpose of this study is to identify the line of therapy that ivabradine is added for pediatric arrhythmias and evaluate dosing for this indication.

Methods: This descriptive, retrospective cohort study included patients aged 0-17 years admitted to a tertiary care academic children's hospital who received at least twenty-four hours of ivabradine between January 1, 2021 and November 30, 2023. Patients were excluded if they received ivabradine prior to admission or for any indication other than arrhythmia. Data collection included demographics, ivabradine dosing regimens, concomitant antiarrhythmic medications in the seven days prior to ivabradine initiation, concomitant medications with drug-drug interactions, and adverse events. The primary objective was identification of the line of therapy and type of arrythmia for which ivabradine was initiated. Secondary objectives included initial and peak median dose of ivabradine and concomitant drug interactions with a class C, D, or X, as well as evaluation of adverse events. Adverse events included bradycardia (defined as less than 100 beats/min in neonates and less than 50 beats/min in infants and children), prolonged QTc (defined as greater than 480 ms), significant QTc prolongation (defined as greater than 550ms), and incidence of emesis attributed to ivabradine as documented in the medical record. Descriptive statistics were performed for data analyses.

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Results: Seventeen patients were included. Most patients (64.7 percent) were less than one year of age. The types of arrythmias were atrial tachycardia(n=8), junctional ectopic tachycardia (n=4), ventricular tachycardia (n=4), and accelerated idioventricular rhythm (n=1). The majority (70.5 percent) were initiated on ivabradine as a third-, fourth- or, fifth-line anti-arrhythmic. Amiodarone was the most common concomitant antiarrhythmic (n=13). Ivabradine was initiated at a median dose of 0.051 mg/kg/dose, with a median peak dose of 0.07 mg/kg/dose; doses were most frequently administered every 12 hours (n=11; 64.7 percent). For adverse events, three patients (18.8 percent) experienced bradycardia, three (18.8 percent) experienced QTc prolongation, one (6.3 percent) experienced significant QTc prolongation, and two (11.8percent) had reported emesis. Only one patient required a dose decrease for their adverse event of bradycardia. For drug-drug interactions, almost all patients (n=16) had a Class C interaction, and three had a Class X interaction.
Conclusions: Ivabradine was initiated as a third-, fourth-, or fifth-line anti-arrhythmic. Ivabradine dosing was comparable to other published data for treatment of pediatric arrythmia. Most patients had at least one drug-drug interaction, while eight had reported adverse events with ivabradine. Overall, larger studies of ivabradine use in pediatric arrhythmias is needed.

MANAGEMENT OF PERSISTENT STAPHYLOCOCCUS AUREUS BACTEREMIA. Lauren Bull, Eva Wagner, Alisha Chesser, Avani Patel, Jessica Tansmore. Nationwide Children's Hospital
Introduction: Ideal management of Staphylococcus aureus bacteremia includes a regimen with the least number of narrow-spectrum antimicrobials for the shortest effective duration to help minimize adverse effects and resistance. Persistent S. aureus bacteremia definitions range from two to seven days of positive cultures. There are currently no formal national guidelines on the management of persistent S. aureus bacteremia. There is no standardized protocol for the management of persistent S. aureus bacteremia at our institution. The purpose of this medication use evaluation was to review antibiotic regimens for persistent S. aureus bacteremia and determine which regimen(s) allowed for quickest clearance after source control while minimizing adverse effects.
Methods: This was a retrospective chart review of patients admitted to our institution from06/01/2019 through 06/01/2024 with at least two positive S. aureus blood cultures on different calendar days during the same encounter. The date of first positive S. aureus blood culture, source of infection, date of source control, date of last positive blood culture, and total number of positive blood cultures were used to determine the time to clearance. The antibiotic regimens, including dose, route, frequency, and duration, were collected and compared to evaluate the regimen with fastest clearance. Safety of antimicrobial therapies was assessed through reported side effects, including acute kidney injury, myopathy, Clostridium difficile infection, peripheral neuropathy, white blood cell count, platelet count, and absolute neutrophil count.
Results: There were 20 unique patients with 21 incidences of bacteremia. The most common source was osteomyelitis. There were 16 incidences of methicillin-susceptible S. aureus bacteremia, and the average time to clearance was 5 days. There were 5 incidences of methicillin-resistant S. aureus bacteremia, and the average time to clearance was 6.6 days. The most common initial agent for methicillin-susceptible S. aureus was nafcillin, followed by cefazolin. Nine patients received an adjunct agent with daptomycin being the most common. Nine patients were transitioned to oral cephalexin. Vancomycin was the initial agent for methicillin-resistant S. aureus for all patients. Daptomycin was used as an adjunct agent in all 5 patients, and cefazoline was also used in 2 patients. Acute kidney injury occurred in 57% of bacteremia cases. The majority of patients receiving vancomycin developed an acute kidney injury. No patients were diagnosed with C. difficile infection.
Conclusions: There is variation in prescribing practices for persistent S. aureus bacteremia at our institution, including agent of choice, dose, frequency, second-line agents, and duration. A broader time-frame with more patients should be analyzed to determine which regimen is superior.

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PEDIATRIC HYPERHIDROSIS: DEMOGRAPHICS AND PRIMARY VS. SECONDARY TREATMENT CHARACTERIZATION. Chad Knoderer, David Cao, Shannon Ruiz, Joree Ruiz., Yvonne Chiu. Butler University College of Pharmacy and Health Sciences.
Introduction: Data on pediatric hyperhidrosis (HH) remain limited. This condition, marked by excessive sweating in one or more areas of the body, can lead to significant psychosocial challenges and social stigma. In severe cases, HH may profoundly disrupt daily life and activities. Oraland topical anticholinergics, aluminum chloride hexahydrate, and botulinum toxin are often used as treatment, but their optimal place in HH management remains unclear due to limited data. This study examines the demographics, initial treatment recommendations, and subsequent treatment adjustments at follow-up visits for pediatric patients with HH presenting to a dermatology clinic.
Methods: A retrospective chart review was performed of consecutive new patients </= 18 years with primary HH presenting to a HH clinic within a single tertiary care academic institution. Data extracted from the electronic medical records included age, sex, race/ethnicity, body mass index (BMI), family history, HH site, and HH disease severity scale (HDSS) score. Initial treatment recommendations, secondary treatment adjustments, and reasons for treatment change were also collected.
Results: Data from 264 patients, having a mean ± standard deviation of 13.8 ± 3.4 years (range: 6 months – 18 years), were included. Female (72.0%) and white patients (75.0%) predominated. Most common locations of HH were concurrent palmoplantar and axillary sweating (29.9%), palmoplantar only (21.6%), and focal axillary (19.7%). Generalized HH was noted in 56 patients (21.2%). Aluminum chloride hexahydrate solution (31.1%) and oral oxybutynin (35.6%) were the most common treatments at initial visit. Most common initial treatments for generalized were oxybutynin (57.1%) and glycopyrrolate (23.2%), while focal axillary sweating was initially treated with aluminum chloride solution (51.9%) and topical glycopyrronium (26.9%). Follow-up data were available in 158 (60%) patients. About half (n=80) continued their original therapy. Of the 91 patients who initially received oral medications, 61.5% (n=56) continued with oral treatment. Seventeen

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of the 57 (29.8%) patients initially started on topical therapies continued with topicals. In the 78 patients with a treatment change, the common reasons were due to side effects alone (42.9%), lack of improvement (31.2%), a combination of the two (13%), or patient preference/cost (11.7%). Changing between oral medications (n=20) was most often due to anticholinergic side effects (80%), followed by lack of improvement (20%).

Conclusion: Our retrospective study longitudinally characterizes a pediatric HH clinic and provides valuable information on common initial treatments and follow-up data, offering insights into primary pediatric HH management. Additional research, including the development of treatment algorithms, would be valuable.

REVIEW OF CORTICOSTEROID-INDUCED ADRENAL INSUFFICIENCY IN THE NEONATAL INTENSIVE CARE UNIT (NICU). Jennifer Barnes, Marissa Marks. Atrium Health Levine Children's Hospital

Introduction: Patients in the Neonatal Intensive Care Unit (NICU) receive corticosteroids for a variety of reasons. Prolonged exposure to corticosteroids may cause adrenal suppression, adrenocorticotropic hormone (ACTH) stimulation testing is the diagnostic gold standard. A guideline was recently developed in the NICU at Atrium Health Levine Children's Hospital (AH LCH) to identify patients at the highest risk of corticosteroid-induced adrenal insufficiency and to standardize its diagnosis and management. The purpose is to assess guideline adherence and describe the patients who received ACTH stimulation testing as a part of the corticosteroid-induced adrenal insufficiency guideline.

Methods: This a retrospective, observational, single-center evaluation. The study included infants who had received corticosteroids in the AH LCH NICU from December 1, 2022 to July 31, 2023.The primary objective is to assess the percentage of patients who received corticosteroids that qualified for an ACTH stimulation test based on the guideline. Further analysis was completed on those infants who received ACTH testing. Data collection includes cortisol levels at baseline and 30 and 60 minutes after the ACTH test and the percentage of patients that "pass" according to guideline. Secondary objectives include the duration of corticosteroids, inhaled corticosteroid use at the time of the ACTH test, time from the last corticosteroids to the ACTH test, percentage of cortisol levels timed correctly, route of administration of the ACTH test, hospital length of stay and percentage of patients who receive an endocrine consult/discharged on systemic corticosteroids with a "failed" ACTH test.

Results: During the study, 122 patients were on corticosteroids and 24% of patients received an ACTH stimulation test. Overall, 38 ACTH stimulation tests were administered to 29 patients. Adherence to the corticosteroid-induced adrenal insufficiency guideline for who should receive testing was very high at 94%. The average patient who received an ACTH stimulation test was gestation age 26 weeks and received approximately 27 days of corticosteroids. Only 66% of ACTH stimulation tests were passed at 30, 60 minutes, or both with approximately 80% of the levels timed correctly. Of the 9 patients who received a second and/or third ACTH stimulation test, approximately half of the patients subsequently passed. A lower percentage of patients who failed the ACTH stimulation test received an endocrine consult (~54%) and were discharged appropriately on corticosteroids (~31%).

Conclusion: Approximately a quarter of patients in the NICU that receive steroids qualify for ACTH stimulation test and many of those patients will demonstrate adrenal insufficiency. A guideline approach to adrenal insufficiency monitoring is needed for identifying, testing and providing follow-up for those high-risk patients. Our results showed opportunities for improvement within our NICU such as preference of IV over IM administration and closer collaboration with endocrinology upon discharge.

RETROSPECTIVE REVIEW OF TIME TO REACH THERAPEUTIC TACROLIMUS LEVELS IN HEART TRANSPLANT PATIENTS. Kayleigh Cress, Megan Lewis. Nationwide Children's Hospital.

Introduction: Tacrolimus is a key component in maintenance immunosuppression (IST) regimens following heart transplantation (HT). Typical starting doses range from 0.1 to 0.3 mg/kg/day divided twice daily. Blood concentrations are followed to ensure adequate dosing for the prevention of acute cellular rejection, to ensure graft survival and to avoid toxicities. Goal tacrolimus levels are typically between 10-15 ng/mL for the first year after HT. Tacrolimus blood concentrations are affected by age, renal function, enteral feed tolerance, and hepatic function. This purpose of this study is to evaluate the time it takes to reach therapeutic tacrolimus levels in the immediate post-operative period following HT as well as the average dose (mg/kg/day) that is required to reach therapeutic levels.

Methods: This study is a single-center, retrospective chart review including patients of all ages who received enteral tacrolimus after HT from January 1st, 2014 to July 31st, 2024. Patients were excluded if their tacrolimus goal differed from 10-15 ng/mL, they experienced death prior to initial HT discharge, did not receive tacrolimus as part of their IST regimen, or if tacrolimus was discontinued for adverse effects or inability to effectively administer. Tacrolimus doses and levels were collected for each post-operative day, and therapeutic levels were defined as two consecutive levels within goal range. Additional data collection included patient demographics, estimated renal function, and route of administration. This study received expedited IRB approval.

Results: 67 patients were evaluated, and 58 patients were included for data analysis. The mean age was 10.4 years (range 0.17 to 45 years) including 37 males (63.8%) and 40 white (69%) patients. The mean time to initiation was 6.1 days, and the mean initiation dose was 0.09mg/kg/day. The mean time to therapeutic levels was 28.1 days, and the mean therapeutic dose was 0.21 mg/kg/day. Demographic differences associated with higher dose requirements to achieve therapeutic levels included age less than 1 year (mean therapeutic dose 0.34 mg/kg/day), Black/African American (mean therapeutic dose 0.35 mg/kg/day), and patients receiving tacrolimus through a feeding tube (mean therapeutic dose 0.33 mg/kg/day).

Conclusions: Initial dosing of tacrolimus at our institution is on the lower end of the recommended dosing range which may contribute to longer time to therapeutic levels and increased risk of rejection. The majority of patients required 0.21 mg/kg/day to reach therapeutic goal levels, with higher dosing requirements in certain patient populations.

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ROMIPLOSTIM DOSING AND EFFECTIVENESS IN CHEMOTHERAPY-INDUCED THROMBOCYTOPENIA. Julianne Fava. Kristen Curry, Cassandra Rush, Mara Crabtree. Nationwide Children's Hospital.

Introduction: Chemotherapy-induced thrombocytopenia (CIT) is a common toxicity secondary to pediatric cancer treatment. CIT can result in negative impacts on patients' overall treatment leading to chemotherapy delays, bleeding complications, increased platelet transfusions, and risk of relapse. To mitigate these risks, romiplostim is frequently prescribed to increase platelet production; however, optimal dosing strategies in pediatric oncology patients are not well-established. This single-center medication use evaluation aimed to describe the dosing strategy, efficacy, and safety of current prescribing practices of romiplostim for CIT.

Methods: This study was a medication use evaluation exempt from institutional review board review at Nationwide Children's Hospital (NCH). A retrospective electronic medical record review was conducted of patients under the age of 25 years if they received romiplostim from August 1, 2019 to July 31, 2024 for CIT. Patients who underwent bone marrow transplant prior to romiplostim, were prescribed an alternative thrombopoietin receptor agonist or rituximab during the study period, received oncologic treatment outside of NCH, or received romiplostim for a different indication were excluded. Collected outcomes include dose (initial, effective, and time between dose escalations), time to response (defined as platelets above treatment threshold), and reported adverse events. Data analysis was performed using descriptive statistics.

Results: There were 18 unique patients included with a total of 21 romiplostim courses. The majority of patients had Ewing's sarcoma, followed by rhabdomyosarcoma. The mean initial dose was 3.7 mcg/kg, and the mean effective dose was 5.7 mcg/kg. Patients had a mean of 2.3 dose escalations per course, with an average increase of 1.4 mcg/kg for each dose escalation. The mean time to response was 26.7 days. There was one adverse drug reaction reported of thrombocytosis that occurred at a dose of 3.2 mcg/kg.

Conclusion: Romiplostim appears safe and effective for CIT. With the time-critical nature of avoiding chemotherapy delays, romiplostim should be started at higher doses than is recommended for other indications. Providers can consider starting romiplostim at 5 mcg/kg and increasing weekly by 1-2 mcg/kg for pediatric CIT.

SOTALOL CONTINUOUS INFUSIONS IN CRITICALLY ILL NEONATES AND CHILDREN. Katy Stephens, Jamie Miller, Avery Parman, Ashley Benedict, Shashank Behere, Peter Johnson. Oklahoma Children's Hospital at OU Health

Introduction: Sotalol, a class III antiarrhythmic, works by non-selectively blocking beta-adrenergic receptors and potassium channels. In hemodynamically unstable patients, a continuous infusion may be preferred over intermittent intravenous (IV) sotalol to decrease the risk of hypotension and bradycardia. However, there is a paucity of literature regarding continuous infusion sotalol. The purpose of this study was to describe the use of intravenous sotalol continuous infusions in critically ill neonates and children.

Methods: This was a retrospective cohort study of patients less than 18 years admitted to a tertiary care academic medical center from January 1, 2018 to November 30, 2023 and received a sotalol continuous infusion for at least twelve hours. Data collection included demographics, type of arrhythmia, presence of congenital heart disease, sotalol dosing and duration, concomitant antiarrhythmics, concomitant drug interactions with class C, D, or X agents, and adverse events. The primary objective was to identify the median dose and duration of sotalol continuous infusions. Secondary objectives included identifying class C, D, or X drug interactions with sotalol and identifying any adverse effects associated with sotalol administration. For this study, adverse events included bradycardia (defined as less than 100 beats/min in neonates and less than 50 beats/min in infants and children), prolonged QTc (defined as greater than 480 ms), and significant QTc prolongation (defined as greater than 550 ms). Descriptive statistics were performed for data analyses.

Results: Seven patients were included. The age range for these patients was 0.33-192 months. Three patients had supraventricular tachycardia, and four patients had atrial tachycardia. Four patients had congenital heart disease. Sotalol was initiated as a second or third-line agent and five patients received a sotalol loading dose prior to the continuous infusion. The median initial dose was 71 mg/m^2/day and ranged from 22.8-85.2 mg/m^2/day. The median infusion duration was 135.9 hours and ranged from 25.3-2129.2 hours. Four patients had adverse events. Two patients required a dose reduction, one for bradycardia and prolonged QTc and the other for hypotension. One patient required the addition of vasopressors. All patients were on concomitant antiarrhythmics while on sotalol continuous infusions. All patients had at least two drug interactions, with a median of six interactions per patient.

Conclusions: Sotalol was initiated as a second- or third-line anti-arrhythmic. There was variability between patients for the dosing and duration of the sotalol continuous infusions. Adverse events and drug interactions were notable, with three patients requiring dose adjustments or other interventions for the adverse event, and all patients having documented drug interactions. Overall, larger studies evaluating intravenous continuous infusion sotalol in children and neonates is needed.

Category: Best Practice

CONTINUING PROFESSIONAL DEVELOPMENT SELF-REPORTING BY BOARD-CERTIFIED PEDIATRIC PHARMACY SPECIALISTS. Ellie LaNou, Kenja Hanniford, Brian Lawson. Board of Pharmacy Specialties.

Introduction: Board certified pediatric pharmacy specialists (BCPPS) meet eligibility criteria including education, licensure, and practice experience requirements. Through achieving a passing score on the certification examination, BCPPSs demonstrate advanced knowledge, skills, and experience necessary to optimize safety and outcomes for the pediatric patient population. BCPPSs design, implement, monitor, and modify pharmacotherapeutic treatments for pediatric patients. Maintaining competency through continuing professional development (CPD) is critical to BCPPS providing high quality patient care.

CPD can be defined as a commitment to life-long learning through a process of intentional reflection, planning, learning,

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evaluation, and application while recording and reviewing throughout the process. Among pharmacists outside of the United States and other healthcare professionals globally, CPD is employed for maintaining and/or enhancing professional competencies. The integration of CPD into the BPS recertification framework was announced in January 2023. In January 2024, the Board of Pharmacy Specialties (BPS) began integration of CPD into the recertification framework for board-certified pharmacists. This project aims to monitor the uptake of CPD by comparing the number of self-reported entries for BCPPS certifications to the number of self-reported entries for all eligible specialty certifications at the end of Q3 2024.

Methods: Through the MyBPS platform, board-certified pharmacists with certifications eligible for the CPD-recertification framework self-reported annual reflections/plan entries and CPD activities from various categories including: continuing pharmacy education (CPE) and CPD portfolios; academic, professional and interprofessional study; teaching and precepting learners; scholarly activities; workplace activities; and leadership and professional service. At the end of Q3 2024, activities within the BPS database were queried to quantify CPD uptake by specialty.

Results: At the end of Q3 2024, 8592 certifications across the 14 BPS specialty certification programs were eligible for the CPD-recertification framework, 415 of which were BCPPS certifications. Across all specialties, 4613 entries were self-reported at the end of Q3 2024, including 3153 CPD activities and 1460 annual reflection/plan entries. 211 total entries were self-reported for BCPPS certifications at the end of Q3 2024, including 140 CPD activities and 71 annual reflection/plan entries. 0.51 self-reported entries were made per eligible BCPPS certification at the end of Q3 2024 compared to 0.54 self-reported entries per eligible certification across all specialty certifications.

Conclusion: At the end of Q3 2024, the proportion of self-reported entries for BCPPS credentials was similar to the proportion of entries among all eligible specialty certifications. This finding indicates that BCPPSs are well positioned to make recertification progress within the updated CPD-recertification framework. BCPPSs may benefit from additional outreach and education on CPD for BPS recertification. BPS will continue monitoring the uptake of CPD.

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COMPARING THE SAFETY OF INTRAVENOUS KETOROLAC BEFORE AND AFTER THE IMPLEMENTATION OF ORDER OPTIMIZATION ON A GENERAL MEDICINE PEDIATRIC UNIT. Molly Brong, Christina Schwarz, Melanie Pena. Driscoll Health System - Rio Grande Valley

Introduction: Ketorolac is a nonsteroidal anti-inflammatory medication indicated for the short term (maximum 5 days) management of acute, moderately severe pain in adults. Ketorolac use has been associated with significant adverse reactions and carries boxed warnings including acute kidney injury (AKI), cardiovascular thrombotic events, and bleeding. Studies have demonstrated an analgesic ceiling effect associated with intravenous ketorolac. Doses higher than 15 mg have proven no significant difference in analgesia and a higher risk of adverse events. While not currently indicated for pediatric use, ketorolac is commonly utilized for pain management with a maximum recommended treatment duration of 72 hours.

Methods: This is a single center, retrospective chart review of the electronic medical record for patients admitted to the

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general pediatric unit who received intravenous ketorolac as part of their analgesia regimen. Changes were implemented within Driscoll Children's Hospital's computerized order entry system that included removal of a 30mg dose button and modification of the preset duration from 5 days to 48 hours. Patients were randomly selected from pre and post intervention cohorts. Data points were collected on patient demographics, number of administered doses greater than 15 mg, and incidence of AKI during or after treatment. AKI was defined per the KDIGO guidelines. This medication use evaluation was not determined to require institutional review board approval.

Results: A total of 77 patients that met inclusion criteria were followed. Thirty-eight patients from the pre-intervention group, and thirty-nine patients from the post-intervention group were randomly selected. Both groups had similar distribution for race and ethnicity. The mean age for both groups was 10.5 years and 9 years respectively. There was an even distribution of males to females in the pre-intervention group, and the post-intervention group was predominantly male (62%). In the pre-intervention group, 127 doses of ketorolac were administered with 37% of doses greater than 15 mg. This resulted in 42% of patients developing an AKI during treatment. In the post-intervention group, 120 doses were administered with 25% of doses greater than 15 mg. This change reduced the incidence of AKI to 21%. A chi-square test of independence was performed which revealed a statistically significant difference between both groups with number of doses greater than 15 mg, as well the incidence of AKI.

Conclusion: Implementation of order optimization in the CPOE system resulted in a 12% decrease in doses greater than 15 mg and a 21% decrease in AKI events. These results indicate that small optimizations made to order panels produce significant impacts on practices and patient safety. Prescribers should be educated on the risks associated with ketorolac and limitations placed on dosing. Further optimizations, such as a dose and duration hard stop may further improve patient safety.

ELEVATING PATIENT SAFETY BY IMPLEMENTING NEONATAL ELECTRONIC HEALTH RECORD (EHR) PHARMACY TOOLS AT SIX ADULT HOSPITALS. Colleen Djordjevich, R. Zachary Thompson, Jennifer Park, Rebecca Patton. Nationwide Children's Hospital

Introduction: Nationwide Children's Hospital (NCH) is a free standing pediatric academic medical center that manages seven neonatal intensive care units (NICU) across six delivery (host) hospitals. Each host leases NCH EHR to ensure consistency across the organization. Host pharmacy staff dispense first doses, intravenous fluids, and re-dispensed medications for NCH neonatal patients, but historically did not have access to NCH EHR. Neonatal doses require multiple manipulations to make measurable and administrable doses, creating high risk practices. Host staff utilized paper and manual manipulation to prepare doses for the NICU patients, which differed from host and NCH institutional standards for compounding. Leadership teams and front-line staff suspected events were going unrecognized due to the lack of standard safety precautions, primarily barcode scanning. The objective of the project sought to increase patient safety by implementing an EHR with pharmacy dispensing tools at the six host hospitals.

Methods: An evidenced based practice project was performed utilizing NCH's Project Management Office methodology (Image 1) and the interprofessional team was assembled. Using the model for improvement framework, this project followed the concepts of plan, do, study, and act (PDSA) when implementing the neonatal EHR in host pharmacies. Significant EHR build was completed and modified to meet the needs of host staff.

Previous information was not available to determine the number of medication events that occurred within the pharmacy. However, near miss data was followed longitudinally throughout the project to complete necessary quality improvement.

Each site required individualized planning due to institutional needs and the sites crossed three different health-systems (Table 1). This included assessing current state, integrating new workflows and technology into existing, training planning, and being available to support host staff. Training occurred via multiple modalities to meet the needs of host staff and ensure competency. The following flowchart was created to describe the project process and outputs (Image 2).

Results: Each site successfully implemented EHR safety tools to dispense neonatal doses. A total of 567 users were added to the system to ensure appropriate dispensing, all of which were non-NCH employees requiring customized build within identity software. Near miss information showed mis-scanned medications, compounding errors, and dispensing errors. This confirmed the core team's hypothesis of misses that could have previously reached patients with the previous paper workflows. Near misses decreased through the duration of the implementation across sites (Graph 1). Lesson's learned strategies were utilized and implemented before engaging the next site (Table 2).

Conclusion: Implementation of EHR safety tools lead to identification of near miss dispenses and resolution before reaching patients. Unique hospital and pharmacy models can be utilized to improve neonatal and pediatric care in adult hospitals. Future directions include EHR compliancy, annual training, and assessment of near misses.

IMPLEMENTATION AND MONITORING OF A PEDIATRIC PHARMACIST-LED AMINOGLYCOSIDE DOSING PROTOCOL. Leigh Ann Witherspoon, Lulu Jin, Steve Grapentine. UCSF Benioff Children's Hospital

Introduction: Aminoglycosides are narrow therapeutic index medications. When dosed and monitored suboptimally it increases the risk of clinical treatment failure and serious side effects such as ototoxicity and nephrotoxicity. Clinical pharmacists are best suited to manage aminoglycoside dosing and monitoring due to their extensive training and knowledge in pharmacotherapy. The goal of this quality improvement project was to implement aminoglycoside dosing prescribing authority and protocol in pediatric patients at Benioff Children's Hospital – San Francisco (BCH-SF). As part of this prescribing authority, for any pediatric patient elected to be in the protocol by the provider, the pharmacist can modify the initial aminoglycoside dose, order aminoglycoside levels, and adjust subsequent aminoglycoside dose based on levels and renal function. There are several outcome metrics measured as part of this project to ensure quality and safety of this pharmacist-led aminoglycoside dosing protocol.

Methods: In preparation for the implementation of aminoglycoside dosing prescribing authority and protocol in pediatric patients at BCH-SF, all inpatient pharmacists at BCH-SF were

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required to complete an online competency course. Upon completion of this course, all pharmacists had to pass a course exam with 100% accuracy. In addition, multiple in-services were provided to pharmacists at BCH-SF to review the protocol and example patient cases as well as addressing clinical questions and concerns. The metrics that have been continuously measured post-implementation include overall utilization rate of aminoglycoside per pharmacy protocol in pediatric patients at BCH-SF as providers may elect to opt out of the protocol and the overall aminoglycoside-associated acute kidney injury (AKI) events post-implementation compared to pre-implementation baseline. The latter metric is to ensure and maintain patient safety in utilization of this pharmacist-led dosing protocol.
Results: Following education, our pharmacist-led protocol was implemented in October 2024. Following implementation, our goal has been to maintain at least 50% protocol utilization. In October 2024 it was 100% and in November 2024 it was 95%. Our safety metric of acute kidney injury events was defined as a serum creatinine absolute value greater than 0.3 mg/dL or a 50% increase in serum creatinine from baseline in patients not on hemodialysis. In both October and November 2024 there were no AKI events documented. Further results will be submitted with the final poster.
Conclusions: With the preliminary results available, our organization has seen greater than 90% utilization of our pharmacist-led protocol without a change in AKI events in our patients. Additional conclusions will be submitted with final poster after further evaluation.

IMPLEMENTATION OF IV PRODUCT IMAGE CAPTURE IN A PEDIATRIC HOSPITAL. Sarah Scarpace, Vinnie Ortiz, Felicia Lee, Jennifer Ou. UCSF Benioff Children's Hospital
Introduction: Image capture implementation for sterile compounding has been associated with improved medication safety and decreased medication errors. We sought to implement this technology in a pediatric hospital to further improve medication safety. Our pediatric main inpatient pharmacy prepares and dispenses an average of 226 IV products daily and our chemotherapy satellite dispenses 28 IV products daily based on a 3-month average.
Methods: Prior to implementation we estimated the additional time added per day for both the main pharmacy (~5 hours) and chemotherapy satellite (0.5 hours) based on internal time studies of 1.1 minute/medication as well as reviewed the IV compounding workload by hour and added in an additional IV compounding technician resource during the busiest 4 hours of the day. Initial implementation included a training competency along with hands-on training for Hovercam in July 2024 for all technicians along with deployment of a superuser available on-site for the pharmacists along with additional ad hoc training as needed for enhanced comfort. On-site supervisory pharmacist and technician staff were also trained as additional superusers to be able to further support staff and provide basic troubleshooting after initial on-site trainers left. Initial challenges that were identified that were different and needed additional staff guidance and modifications included hood/computer placement, ergonomic screen arms, dilutions, standard mid-prep checks, and smaller syringe sizes necessitating different picture resolutions.
Results: We set the overall departmental goals initially at 50% image capture rate by 6-month of utilization and >95% to match the system goals by the end of the FY. We set initial goals in a phased approach with requesting technician staff to utilize the camera initially for 10 IV products compounded per month in July 2024 and increasing by 5 products monthly to an ultimate goal to utilize image capture for as many products as possible during a particular shift. We provided monthly feedback to the staff on progress of each of the work areas including our OR satellite, chemotherapy infusion satellite and main pharmacy. Starting in September 2024, we implemented limited mid-prep checks that were successful and saved time for technicians and pharmacists. We met our overall initial goals for 50% image capture rate within 4 months of initiation and are continuing to make monthly progress on track. Our OR satellite and chemotherapy satellite adopted image capture early on and have continued to have high compliance reaching 87.5% and 94.5% for November 2024 respectively. Our main pharmacy reached >50% image capture rate by November 2024.
Conclusions: Overall, our innovative approach including appropriate resources, training and support, phased implementation, limited mid-prechecks along with monthly process feedback along allowed us to successfully implement image capture of pediatric IV preparations.

IMPROVING PEDIATRIC OPIOID SAFETY THROUGH ENHANCED PATIENT EDUCATION. Alina Forin, Caitlin Aberle, Lydia Hart, Jael Kemp-Powell, Kristina Melchert, Mary Tomlinson. Maria Fareri Children's Hospital, Westchester Medical Center Health Network
Introduction: Pediatric patients discharged from the hospital postoperatively often receive prescriptions for oral liquid opioids for pain management. Caregivers are responsible for administering the correct dosage using syringes, but without proper education, dosing errors can result in serious adverse effects including opioid overdose. The primary goal of this initiative was to develop standardized best practices for prescribing, dispensing, documenting and educating caregivers on liquid opioid administration to ensure safer discharge practices and prevent opioid overdose in pediatric patients. The project also aimed to improve EHR documentation of opioid-related education and ensure consistent counseling through a collaboration with outpatient pharmacy. Furthermore, the project sought to evaluate the effectiveness of incorporating a teaching method that uses return demonstration to verify caregiver comprehension and adherence.
Methods: The project began in July 2022 and concluded in December 2023. A multidisciplinary team created a comprehensive, standardized process for pediatric opioid discharge, focusing on caregiver education regarding safe liquid opioid administration, storage, overdose recognition, and disposal. Nursing staff were trained to educate caregivers on the critical aspects of opioid safety. Caregivers were asked to verbalize and demonstrate their understanding, which was then documented by nurses in the EHR. Retrospective chart audits were conducted to assess compliance with opioid discharge education, counseling, and documentation. Key metrics included: Opioid Discharge Education Enhancement, Discharge Counseling Provided by outpatient pharmacy, and Enhanced Documentation of Opioid Discharge Counseling in the EHR. Any nonconformities were addressed through collaboration with clinical leadership.
Results: At the start of the project, compliance rates were 10% for Opioid Discharge Education Enhancement, 10% for

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Discharge Counseling Provided by outpatient pharmacy, and 0% for Enhanced Documentation of Opioid Discharge Counseling in the EHR. By December 2022, 100% compliance was achieved for both Opioid Discharge Education Enhancement and Discharge Counseling Provided by outpatient pharmacy. Compliance for Enhanced Documentation of Opioid Discharge Counseling in the EHR increased to 90% by the end of December 2023. There were no opioid overdose events reported after project implementation which supports that return demonstration significantly improved caregiver understanding and adherence.

Conclusion: Standardizing discharge practices for opioid prescribing, caregiver education, and EHR documentation led to improved compliance and caregiver comprehension. The success of this initiative highlights the importance of continuous training for clinical staff and caregivers to sustain best practices in pediatric opioid stewardship. Replication of this approach in other institutions is feasible, offering a model for improving safety and reducing opioid-related risks in pediatric patients.

INNOVATIVE APPROACH TO IMPLEMENTATION OF AUTOMATED MEDICATION TRACKING MECHANISMS TO IMPROVE LOCATING MEDICATIONS IN A PEDIATRIC HOSPITAL. Sarah Scarpace Lucas, Jennifer Ou, Leigh Ann Witherspoon, Lulu Jin, Vinnie Ortiz, Felicia Lee. UCSF Benioff Children's Hospital.

Introduction: We sought to decrease the number of missing medications requiring redispensing through the implementation of automated dispense tracking and dispense receiving on the inpatient units. Prior to implementation of automated tracking, we identified a baseline percentage of 11.53% (15.3K redispenses annually) from the previous 2 years of missing medication requests from the inpatient pharmacy. The overall goal of an automated tracking and receiving system was to further identify and assist nursing to identify the correct location of medications and ultimately to improve the patient experience through a greater number of medications being available for administration.

Methods: We implemented an electronic dispense tracking process in October 2023 to assist in improving the tracking of medications when they physically left the inpatient pharmacy. We implemented a dispense receiving process in the medication rooms by pharmacy personnel in January2024 and further refinement to location tracking in June 2024 to further identify where medications leaving the pharmacy were placed upon delivery. We set goals for overall dispense tracking and dispense receiving at >95% to match our system goals. Initially dispense receiving location tracking was not standardized leading to suboptimal receiving results. Starting in June 2024, we developed and implemented barcodes for all areas where medications could be delivered including Refrigerator, Cassette, Fluid Bin, Hazardous Bin and Oversized Bin. These codes were further refined with the addition of Refrigerated Chemo Bin based on staff feedback. To identify scanning compliance challenges, we completed weekly data review and developed additional filters for discontinued products as well as if medications were sent in a different manner due to patient transfers.

Results: We provided monthly feedback on scanning compliance of medications that are scanned to the correct locations, entered manually, scanned to the medication room only and not scanned. In addition, we specifically provided feedback to delivery technicians demonstrating the importance of utilizing the location barcodes for tracking for further nursing location clarity and to avoid manual entries with a goal of <3% that was achieved by mid-August 2024. Dispense tracking and receiving allowed for a reduction in the number of medications being redispensed by 2.04% to 9.49% (12K redispenses annually) demonstrating utility of the automated tracking mechanism.

Conclusions: Overall, our innovative approach including barcoding, continued data analysis and monthly and individual staff feedback allowed our dispense tracking and receiving implementation to be successful. This automated tracking mechanisms decreased the number of pediatric medications that were requested by nursing to be remade decreased overall pharmacy workload and improving the number of medications available for patient administration.

PEDIATRIC MEDICATION SAFETY IMPROVEMENTS THROUGH PHARMACY TRACKING MECHANISMS. Kimery Leong, Sarah Scarpace Lucas. Terrie Abel, Donna Pang. UCSF Benioff Children's Hospital Oakland

Introduction: The implementation of automated pharmacy scanning tools has been demonstrated to assist in decreasing medication errors in an inpatient pharmacy setting. Our inpatient pharmacy services approximately 200 pediatric beds, dispensing about 750 medication doses daily, where 15% are filled through ADC, 25% through robotics and 60% through traditional manual fills. We wanted to further augment the automated dispense preparation and checking mechanisms initiated earlier through improvements in these functions, as well as adding in both dispense tracking in the pharmacy and on the patient, care floors to improve medication safety. A secondary benefit would be a decrease of redispenses through fewer missing medication requests.

Methods: We set goals for Dispense Prep, Check, and Tracking at 95% or greater, based on our overall pharmacy system goals. We reviewed initial baseline data from January to July 2024 and identified we were at target for Dispense Prep (97.1%), below target for Dispense Check (92.8%) and hadn't started any Dispense Tracking elements. The baseline redispense rate was 15.53% (21K redispenses). Tactics used included staff in-services on process change, educational flyers, staff meeting communications on goals and progress, regular staff updates on progress at morning and afternoon huddles and feedback sessions. Pharmacy Tracking elements were initiated in multiple phases over a 4-month period. Phase 1: Inpatient Dispense Tracking started in August 2024 with first and missing doses, achieving roughly 35% compliance in the first month. Phase 2: Addition of tracking of non-IV manual pull batches and IV batches in October 2024. The Dispense Tracking rate increased to about 70%. Phase 3: Added Dispense Tracking of robotic fills for cassettes in November 2024. One barrier to Dispense Tracking doses from the robot was that no EMR associated barcode printed with each dose. Successful tracking of the cassette medications required the development of a report including order barcodes. Also, equipment was purchased to facilitate barcode scanning.

Results: Dispense tracking rates continued to increase with each implementation phase with dispense tracking occurring for 90% of dispensed inpatient doses four months after implementation. The Dispense Prep, Check, and Track processes are the first 3 steps in the 4-step process of tracking where

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a dose is in the filling process. Dispense Track allows for visibility as to when and how a dose left the pharmacy. The fourth and final step will be to use a mobile device application to track where a dose is located after leaving the pharmacy.
Conclusion: Overall, our phased approach for implementation of the Dispense Tracking process was successful for utilizing a pharmacy tracking mechanism in a pediatric inpatient pharmacy. We will be assessing rates of redispenses, as well.

Best Practice Awardee

PHARMACIST INTEGRATION INTO PRIMARY CARE CLINIC FOR CHILDREN WITH MEDICAL COMPLEXITY. Billie Mitchell, Erica Shepperd-Debnam, Samuel Anti, Nicola Brodie, Kathryn Detwiler. Children's National Medical Center
Introduction: Children with medical complexity (CMC) comprise a vulnerable patient population. CMC are defined as children with multiple chronic health conditions which affect multiple organ systems and result in extremely high health care utilization, as well as a reliance on medical technology. These children comprise about one percent of the pediatric population, but account for about one third of all pediatric health care spending, and this number is projected to increase over time. CMC rely on medications to treat a variety of disease states and maintain quality of life. This puts this population at risk of polypharmacy and adverse drug events. Existing healthcare models do not easily meet the needs of CMC. Studies have found that pharmacy involvement in caring for CMC has identified drug therapy problems and discrepancies in medication reconciliations. To reduce these risks, The Transitions of Care pharmacy team at Children's National Hospital has worked to integrate into the Complex Care Program (CCP), a primary care medical home for CMC within our health system.
Methods: In January 2024, pharmacists on the Transitions of Care team at Children's National Hospital began integration into the Complex Care Clinic. A standard operating procedure was developed at the initiation of pharmacy involvement and is continuously reviewed and updated. Pharmacists are present in the clinic 2 days per week to meet with families. They perform medication histories and reconciliation, create daily medication schedules, and intervene on drug therapy problems as identified. Interventions were documented in Sentri 7 (r) Clinical Surveillance platform, and data was obtained from the same platform.
Results: From April 22, 2024 to October 18, 2024, the team was present in the CCP clinic 2days per week. In this time, we completed 272 medication histories, created 117 Medication Action Plans, and documented 166 additional interventions. 49% of medication histories required changes. Of the 166 additional interventions, the most common were: outpatient medication coordination (39%); medication counseling sessions (20%); providing drug information (19%); and optimizing medication regimens (10%). Soft costs saved over the 6months totaled to $111,894.
Conclusion: Pharmacists cared for 242 unique patients during the study period and their presence has been well received by the interdisciplinary team. Pharmacist interventions such as resolving medication access problems and optimizing medication regimens also led to cost savings Limitations to our services include an inability to follow up with patients after appointments, a presence in clinic < 50% of the time, and not having current involvement in Telehealth visits. We also are not able to compare our metrics to data from prior to pharmacist integration. Moving forward, our team hopes to start integrating into Telehealth services to reach a larger patient population and allow for follow-up between visits.

Category: Scholarship in Teaching

EVALUATION OF STUDENT COMFORT WITH GENDER-AFFIRMING THERAPY IN A PEDIATRIC PHARMACOTHERAPY ELECTIVE. Caroline Sierra. Marina Garner, Jessa Koch. Loma Linda University School of Pharmacy
Introduction: Gender-affirming therapy (GAT) is an emerging topic in pharmacy education and particularly in pediatric patients, who present unique social, legal, and ethical challenges. The purpose of this study is to evaluate student pharmacists' comfort in communicating with and counseling patients who identify as transgender or are receiving GAT before and after a course session focused on GAT in the pediatric population.
Methods: Faculty from Loma Linda University's Schools of Pharmacy and Religion collaborated to design a class session on GAT in pediatric patients within an Advanced Pediatric Pharmacotherapy elective. Topics discussed included gender affirmation, moral distress, gender-affirming hormone therapy, and pubertal blockers. Patient cases addressed ethical issues in dispensing medications for GAT to pediatric patients, potential challenges communicating with caregivers, and benefits of and challenges with different therapeutic options for a given patient. Student pharmacists were surveyed regarding their experiences with patients who identify as transgender or are receiving GAT before and after the class session.
Results: Seventeen students participated in the class session. Out of 9 students who stated they had cared for a patient who identified as transgender, seven (41%) cared for a patient who identified as transgender at work and two (12%) on an Introductory Pharmacy Practice Experience. Most students somewhat or strongly agreed it is their responsibility as a pharmacist to dispense GAT to adult patients (n=16, 94%) and pediatric patients (n=14, 76%). There was no significant difference in students' comfort approaching and speaking to patients who identify as transgender (p=0.40) or counseling on GAT in adult (p=0.12) or pediatric (p=0.30) patients after the class session, though more students strongly agreed they were comfortable in each of these areas after the class session (38% vs 18%, 38% vs 18%, and 31% vs 18%, respectively). Most students agreed or strongly agreed that discussing GAT in pediatric patients was valuable (n=15, 94%) and supported including education on GAT for all student pharmacists (n=14, 88%).
Conclusions: A dedicated class session improved student pharmacists' comfort with counseling patients on GAT and was valuable to the students. Education on GAT should be considered for all student pharmacists.

PRE-POST QUALITATIVE/QUANTITATIVE ASSESSMENT OF A PEDIATRIC COMMUNICATION ASSIGNMENT WITH LIVE CHILDREN. Madison Zelan, Jacob Kelley, Allison Chung. Auburn University Harrison College of Pharmacy
Introduction: Pharmacy students need effective communication skills not only for interacting with adult patients but also with pediatric patients. Children have unique healthcare needs, and their ability to understand medical concepts can be limited by age and developmental stage. Pharmacists must

Scholarship in Teaching (Con't)

learn to communicate in a way that is simple, empathetic, and appropriate for a child's level of understanding. While pharmacy schools focus extensively on communication with adults, the emphasis on pediatric communication is often limited, leaving students less prepared in pediatric settings. This study explores whether a role-play assignment with live children can help increase pharmacy students' confidence in interacting with pediatric patients.

Methods: This qualitative and quantitative analysis assessed a pre/post-survey on a pediatric communication assignment in the Introduction to Pediatrics elective course at the Harrison College of Pharmacy over three years. P2 students counseled pediatric "patients" on their medications, using four case scenarios for different age groups: 3-5, 6-10, 10-14, and 14-18 years. Students had at least two weeks to prepare and were required to find their own pediatric patients, with faculty assistance available. The pre-survey assessed students' comfort and experience communicating with children, and the post-survey allowed reflection on their experiences after completing the assignment. Surveys, administered via Qualtrics, collected both quantitative data (confidence and comfort levels) and qualitative data (expectations, challenges, feedback). Both surveys were anonymous. Inductive thematic analysis was used to analyze open-ended survey responses.

Results: Seventy P2 students (80% aged 20-25) participated in the assignment, most of whom reported baseline comfort as "somewhat comfortable" (51.45%). The pre-survey revealed that 58.57% were only "somewhat confident" in communicating with children, with 4.29% "not confident." The primary concern was explaining medical topics in ways children could understand. The post-survey showed increased confidence, with confidence rising with patient age: 14.49% for 3-5-year-olds, 31.88% for 6-10-year-olds, 55.22% for 10-14-year-olds, and 71.64% for 14-18-year-olds. Ninety-three percent of students found the assignment useful, and 67.7% and 16.9% somewhat or strongly agreed that the activity helped them address challenges in pediatric communication. Four themes emerged from the open-ended responses: 1) commitment to caring for children, 2) developmentally appropriate language, 3) building relationships based on trust, and 4) moments of tension and growth.

Conclusions: Providing pharmacy students with role-play assignments involving live children increases their comfort with pediatric communication and helps them overcome challenges like explaining medical concepts to children. These experiences build their skills and confidence, better preparing them to engage with pediatric patients in clinical settings.

Category: Case Reports

CASE SERIES: MANAGING SEVERE ASTHMA WITH INCREASED FREQUENCY OF BENRALIZUMAB ADMINISTRATION IN THREE ADOLESCENT PATIENTS. Stephanie Duehlmeyer, Celtina Reinert. Children's Mercy Kansas City

Introduction: Benralizumab (BEN) is an interleukin-5 receptor monoclonal antibody indicated for the add-on maintenance treatment of individuals with severe asthma (IwSA) with an eosinophilic phenotype. The dosing for people 12 years and older is 30mg subcutaneously (SC) every 4 weeks for 3 doses then 30mg SC every 8 weeks thereafter. This case series describes the clinical journey of three patients who required more frequent dosing to maintain asthma control.

Methods: A retrospective chart review of IwSA prescribed BEN within the pulmonary clinic at Children's Mercy Kansas City was completed. Individuals whose BEN dosing interval was changed to a maintenance frequency less than every 8 weeks were included. Hospitalization frequency, emergency department (ED) visits, oral corticosteroid (OCS) prescriptions, and relevant laboratory values were examined before and after BEN dose frequency changes.

Results: Three IwSA were included, of whom 67% were female, 100% African American, and the mean age was 14.5 years. All individuals changed BEN dosing frequency, after an average of 5.3 months, due to inadequate control of asthma symptoms and were transitioned to every 7-week dosing as an initial step in maintaining asthma control. When asthma control remained inadequate, two individuals shifted to an every 6-week frequency. One IwSA switched to tezepelumab (TEZ) after 34 months on every 6-week BEN and remains on TEZ presently. The other individual remained on every 6-week BEN for 38 months and continues on this regimen presently. The third individual switched to a 4-week dosing regimen for 32months, briefly trialed a single dose of dupilumab but developed urticaria, and subsequently returned to BEN, continuing this therapy presently. IwSA had an average of 7.4 OCS courses, 3.1 ED visits, and 1.6 hospitalizations between dosing frequency changes. The average baseline blood eosinophil count (BEC) was 910 cells/μL. No one had repeat BEC prior to a dosing frequency change. Following the initiation of BEN, all individuals had a repeat BEC of 0 cells/μL, measured at an average of 37 months after starting treatment. No increase of adverse reactions was noted with increased dosing frequency of BEN during the study period.

Conclusions: While 8-week maintenance dosing of BEN proved effective in clinical trials, real-world experience indicates that some IwSA need more frequent dosing to maintain asthma control. For IwSA who remain inadequately controlled with standard dosing of BEN, shortening the dosing interval maybe a beneficial option, particularly for those unable to switch biologics due to intolerance of other agents or insurance barriers.

HIGH DOSE INSULIN EUGLYCEMIC THERAPY FOR MANAGEMENT OF CALCIUM CHANNEL BLOCKER TOXICITY IN CRITICALLY ILL PEDIATRIC PATIENTS: A CASE SERIES. Lauren Steil, Jessica Anderson, Meredith Jenkins. Monroe Carell Jr. Children's Hospital at Vanderbilt.

Introduction: Calcium channel blockers (CCBs) have a high affinity for plasma proteins, high hepatic first pass metabolism, and a large volume of distribution and therefore are not effectively removed by hemodialysis or hemofiltration. CCBs block calcium channels not only in myocytes, but also within beta cells of the pancreas, and in overdose cause insulin resistance, profound hyperglycemia, and transition of cardiac energy source from glucose to free fatty acids. Therefore, current treatment recommendations include high dose insulin euglycemic therapy (HIET). Data on the use of HIET for pediatric CCB overdose is limited to case reports, but the Pediatric Expert Consensus group recommends a dosing range of 1 to 10units per kilogram per hour continued until hemodynamic stability is achieved. The purpose of this case series is to describe utilization of HIET within a single pediatric intensive care unit, identify areas for standardization and assess clinical outcomes associated with HIET therapy.

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Methods: This is an IRB approved, single center, observational, retrospective case series of patients less than 18 years old admitted to the pediatric intensive care unit from January 1, 2020 to December 31, 2023 for the treatment of CCB toxicity managed with HIET. Data collected includes patient demographics, insulin titration regimens, insulin doses and infusion duration, dextrose dosing, and adverse effects.
Results: Four patients with calcium channel blocker toxicity were treated with HIET. The average age was 14.5 years (range 14-15). All ingestions were intentional with amlodipine involved in 3 cases. Three patients were receiving vasopressors at the initiation of HIET and none of the patients were titrated off vasopressors while on insulin therapy. Overall decrease in Vasoactive-Inotropic Score while on insulin therapy was not observed. Median fluid balance on day 1 of treatment was positive 6.2 liters. Three patients required extracorporeal membrane oxygenation (ECMO) and 2 required continuous renal replacement therapy (CRRT). The median insulin dose was 3.46 units/kg/hour (range 0.71-8.53) and the median maximum dose was 4.56 units/kg/hour (range 1.5-10). The median maximum glucose infusion rate of dextrose containing fluids was 8.2 mg/kg/minute (0.49 g/kg/hour). The median duration of insulin infusion was 42.4 hours (range 12.2-65.2). Three patients survived to hospitals discharge. Only two patients experienced hypoglycemia (defined as <70 mg/dL) requiring treatment and all patients experienced hypokalemia (defined as <3.0 mEq/L) that required treatment during insulin therapy.
Conclusions: In 4 patients with CCB treated with HIET, 1 patient did not make a recovery and survive to discharge. There was a wide range of insulin infusion doses utilized across patients, emphasizing the need for standardization. The most common adverse event experienced was hypokalemia, followed by hypoglycemia.

PTSD MASKING NEUROCYSTICERCOSIS IN 14-YEAR-OLD REFUGEE WITH EPILEPSY. Evan Horton, Hailey Friedrich, Maura Brennan, Cecilia Di Pentima. MCPHS University - Worcester/Manchester
Introduction: Neurocysticercosis is the most common nervous system helminthic infection and a leading cause of epilepsy worldwide. Humans contract the disease through the ingestion of eggs from the tapeworm Taenia solium, typically from fecal matter of an asymptomatic Taenia carrier. When Taenia larvae migrate to tissues within the nervous system (brain parenchyma, subarachnoid space, ventricular system and/or spinal cord), they form cysts leading to pathological changes resulting in clinical symptoms. Seizures and headaches are most common but patients may also develop focal and cognitive deficits. Diagnosis should be obtained through an extensive history, CNS imaging, and serological testing. Treatment consists of the anthelmintics medications albendazole and praziquantel, and potentially corticosteroids. Proper identification and treatment can significantly improve the prognosis of most patients with neurocysticercosis.
Case Report: 14-year-old female Congolese refugee by way of Ugandan camp for several years, who suffered numerous physical and psychological traumas prior to emigrating, presented to neurology clinic due to suspicion of psychogenic non-epileptic seizures, treated with carbamazepine for 5 years. Patient was seen 6 weeks later in the emergency department for potential concussion following unrelated head injury and found to have scattered peripheral calcifications with irregular parenchymal hypodensities on CT. Follow-up MRI two months later found at least 11 cystic lesions of varying age, consistent with neurocysticercosis. Infectious disease admitted patient to begin albendazole, praziquantel, and dexamethasone. Upon review, pharmacy recommended a cross taper of carbamazepine and levetiracetam to avoid a CYP3A4 interaction that would reduce praziquantel concentrations. Patient completed 14 days of anthelmintics and 28 days of corticosteroids followed by a two-week taper. Recommended SSRI therapy was deferred until acute treatment was completed. Six-week follow up imaging showed improvement and patient reported no clinical symptoms.
Observations: Patients emigrating from areas considered highly-endemic for neurocysticercosis (Latin America, sub-Saharan Africa, South and Southeast Asia) who carry additional risk factors (poor sanitation, access to pigs) should have the condition considered and ruled out if displaying more common symptoms like seizures and headache, regardless of other potential causes. In this case, neuroimaging was only performed due to an unrelated head trauma. When treating patients with praziquantel and albendazole, anti-epileptic and analgesic medications should be reviewed for potential drug-drug interactions, specifically cytochrome P450 interactions. Medications should be adjusted in conjunction with neurology providers to insure appropriate anti-infective and symptomatic treatment.
Conclusions: This case highlights the need to explore various diagnoses when encountered with a medically complex patient with an extensive social history. The patient had several risk factors for parasitic infection but symptoms could be easily explained through other more prominent aspects of their history. This case also highlights the need for a pharmacist review of medications prior to initiation of therapy to avoid poor clinical outcomes.

USE OF INTRAVENTRICULAR POLYMYXIN B FOR THE TREATMENT OF RESISTANT VENTRICULITIS IN A PEDIATRIC PATIENT. Richard Haftmann, Selena Warminski. UC Davis Children's Hospital
Introduction: According to IDSA guidelines, select antibiotics may be administered via the intrathecal (IT) or intraventricular routes (IVT) for persistent and difficult to treat ventriculitis and meningitis. There is presently limited data for the use of IVT polymyxin B in pediatric patients. IDSA guidelines provide general guidance on monitoring intrathecal antibiotics, but do not have specific recommendations on the use of polymyxin B since only case reports exist currently.
Case Report: This case report describes a previously healthy five-year-old girl presenting with a history of headaches and subsequent pilocytic astrocytoma who developed Klebsiella pneumoniae meningitis after tumor resection and external ventricular drain (EVD) placement. Prior to polymyxin B, she had received cefepime, ceftriaxone, levofloxacin, and intraventricular gentamicin. The decision to administer polymyxin B intrathecally was based on surgical visualization of ongoing purulence and organized fluid collection in the ventricle despite 4 weeks of appropriate antibiotic coverage. In addition, the klebsiella

Isolate developed resistance to gentamicin so IVT gentamicin was no longer beneficial. Polymyxin B was administered by neurosurgery via the intraventricular route at 10,000 units on

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day one, 20,000 units on day two, followed by the goal dose of 50,000 units every24 hours for four days. Doses were then spaced to every 48 hours to complete a total of 14 days of therapy. The EVD was kept clamped for one hour after each dose administration.

Observations: The patient tolerated each IVT administration of polymyxin B. A brain MRI near the end of the polymyxin B course demonstrated decreasing size in lesion and normalized ventricle size. Hypomagnesemia and hypokalemia were not observed. The patient did not experience any systemic effects or toxicities associated with polymyxin B, including neurotoxicity and nephrotoxicity. Serum polymyxin B concentrations were not evaluated. Although unclear if related to polymyxin B, there was ongoing and profound sodium supplementation requirement despite the EVD being clamped with limited cerebrospinal fluid losses. The patient demonstrated complete resolution after an additional 2 weeks of appropriate systemic antibiotic therapy after IVT polymyxin B was given with eventual discharge home after rehabilitation.

Conclusions: As part of a complex treatment regimen, IVT polymyxin B was safely administered to a pediatric patient with persistent ventriculitis despite 4weeks of appropriate antibiotic therapy. Additional research is needed to confirm the safety and effectiveness of IVT polymyxin B in the pediatric population.

Category: Student Research

COMPARATIVE EFFICACY OF RSV PROPHYLAXIS IN HIGH-RISK INFANTS AND CHILDREN. Jessica Helwig, Jennifer Pham, Mya Nguyen, Leslie Briars. University of Illinois Retzky College of Pharmacy

Introduction: Respiratory syncytial virus (RSV) is the leading cause of hospitalization among infants in the U.S. Historically, RSV prevention relied on monthly intramuscular palivizumab injections for up to five doses for high-risk infants (e.g., those born less than 29 weeks' gestation or 29 – 31+6 weeks with chronic lung disease. The limited half-life of palivizumab requires frequent dosing and adherence to monthly injections. Additionally, infants who were not categorized as high risk would not qualify for palivizumab. Currently, the CDC's Advisory Committee on Immunization Practices recommends nirsevimab, a long-acting monoclonal antibody, as a single-dose regimen, for all infants less than eight months old entering their first RSV season and for high-risk infants aged 8–19 months entering their second season. There is lack of clinical data regarding efficacy of nirsevimab in the highest-risk populations, infants born before 29 weeks 'gestation. This study evaluates the effectiveness of palivizumab and nirsevimab in preventing RSV-associated hospitalizations and medically attended lower respiratory tract infections (LRTIs) in high-risk infants.

Methods: This retrospective, single-center, IRB-approved study compared two cohorts of infants receiving RSV prophylaxis at the University of Illinois Hospital. Cohort 1 (2021- 2023 RSV seasons) received palivizumab, while Cohort 2 (2023-2024 RSV season) received nirsevimab during their first or second RSV season. The primary outcome was RSV-related hospitalizations and medically attended LRTIs in infants born before 29 weeks' gestation and those born 29 – 31+6 weeks with qualifying conditions. Secondary outcomes include mortality, costs, and compliance with RSV prophylaxis. Chi-square tests, t-tests, and regression analyses assessed differences between groups.

Results: Forty-five patients less than 29 weeks' gestation were included: 25 qualified for palivizumab, and 20 for nirsevimab. In the palivizumab group, 18received prophylaxis during the first season, 7 during the second season, and 6 in both seasons. In the nirsevimab group, 5 received nirsevimab during the first season and 3 during the second season. Mean gestational age and birth weight were similar between groups (25.9 ± 1.5 vs 26.4 ± 1.4 weeks, p=0.23; 806 ± 215 vs 884 ± 230grams, p=0.25, respectively). RSV-positive cases were minimal, with 1 case in each cohort and no significant difference in RSV-associated hospitalizations (3.2% vs 0%). The median cost of RSV was significantly lower with nirsevimab ($7129 vs $500, p = 0.006). About 65% of qualified infants received RSV prophylaxis in both groups, and no deaths occurred in either group.

Conclusion: Preliminary results suggest nirsevimab is a more cost-effective option for preventing RSV infections in high-risk infants born less than 29 weeks' gestation. Nirsevimab demonstrated similar efficacy to palivizumab in reducing RSV hospitalizations and LRTIs. These findings support CDC recommendations for nirsevimab as a viable alternative to palivizumab for RSV prevention in high-risk infants.

Student Research Awardee

DEVELOPMENT AND EVALUATION OF A MUCOLYTIC STEP-DOWN ALGORITHM AT A PEDIATRIC CYSTIC FIBROSIS CENTER. Katherine Vitou, Nour Kadouh, Samya Nasr, Hanna Phan. University of Michigan College of Pharmacy

Introduction: Discontinuation of nebulized hypertonic saline (HS) or dornase alfa (DA) for 6 weeks in people with cystic fibrosis (pwCF) age 12 years and older taking elexacaftor/tezacaftor/ivacaftor (ETI) was not associated with diminished lung function per the SIMPLIFY trial and subsequent cohort studies. As a result, our pediatric CF center developed and implemented a mucolytic step-down algorithm (MSDA) for pwCFprescribed ETI. The objective of this study was to evaluate the adoption and outcomes of our MSDA.

Methods: This was a retrospective cohort study evaluating the adoption and outcomes of a MDSA developed and implemented in a large, accredited pediatric CF center between 11/01/2022 and 02/29/2024. MDSA criteria were based on the SIMPLIFY trial and care center team input. PwCF followed by our pediatric CF care center who met algorithm criteria were included. Patients diagnosed with CF transmembrane conductance regulator-related metabolic syndrome and lung transplant recipients were excluded. Data collection included demographics, algorithm processes, and clinical outcomes including lung function (forced expiratory volume in 1 second (FEV1)) and pulmonary exacerbations. Baseline outcomes were defined as the highest value in the previous 12 months at the time of step-down. Data was analyzed with descriptive statistics using Microsoft Excel and SPSS with alpha priori of 0.05.

Results: Of the 265 patients screened, 73 (27.5%) met the MSDA criteria and 47 stepped down therapy. Some reasons for not stepping down therapy included concern regarding lung function trend (11.8%), concern for poor adherence to ETI (7%), family declining step down (5.9%), and exacerbation at time of eligibility (1.2%). Of those in which the MDSA was applied, 26 (55.3%) were initiated by a pharmacist, 10 (21.3%) by a physician, and 11 (23.4%) self-initiated due to nonadherence.

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Among MSDA patients, 36 (76.6%) discontinued HS alone, 4 (8.5%) discontinued alone, and 7 (14.9%) stopped both. The median time from MSDA initiation to post FEV1 measurement was 51 weeks (IQR 21.4). Pre- and post-MSDA change in median FEV1 (p=0.043, baseline 104, IQR 13; post 100, IQR 17.3) was statistically significant; however, not clinically significant. There was no significant change in the number of systemic antibiotic courses prescribed, nor admissions due to pulmonary exacerbations. Among the 47 patients who stepped down in therapy, 5 (10.6%) re-started mucolytic therapy due to factors including decreased lung function (28.6%), pulmonary exacerbation(s) requiring systemic antibiotics and admission (14.3%), and family electing to re-start (28.3%).
Conclusion: In a real-world setting, a majority of pediatric pwCF on ETI, stepping down mucolytic therapy for over 6 months did not result insignificant change of clinical outcomes such as lung function and frequency of pulmonary exacerbations.

DRUG INDUCED LIVER INJURY (DILI) IN NEONATES AND INFANTS: REAL WORLD ELECTRONIC HEALTH RECORDS REVEAL ELEVATED INCIDENCE OF ADVERSE DRUG REACTIONS AND INCREASED MORTALITY RISK. Nicole Kayrala, Martin Yi, Ruud Verstegen, Tamorah Lewis, Cindy Hoi Ting Yeung. The Hospital for Sick Children.
Introduction: Drug-induced liver injury (DILI) ranges from mild liver enzyme elevations to severe liver failure. The global incidence is 14-19 per100,000 persons, with 7-15% of acute liver failures in U.S. adults due to non-acetaminophen causes. Limited data exist for infants and newborns. This study aims to characterize DILI in neonates and infants using electronic health records from a large pediatric teaching hospital in Canada.
Methods: A retrospective cohort study was conducted using de-identified data from the Hospital for Sick Children in Toronto, Canada. Subjects ages range from 0 days to 6 months of age. Outcomes include 1) DILI prevalence, 2) common medication exposures, and 3) comparisons of mortality and hospital stay between DILI and non-DILI patients. Study drugs included meropenem, acetaminophen, ampicillin, morphine, fluconazole, and intralipids. DILI diagnosis required specific liver enzyme criteria between the start of exposure and up to 14 days following the end of exposure.
Results: The study identified 15,634 exposures from 6,710 patients, with 1,228 (7.9%) related to DILI. Among first exposures, 656 (7.5%) were associated with DILI. The most common medications associated with DILI were morphine, ampicillin, and intralipids. Patients with DILI had higher mortality rates and longer hospital stays compared to non-DILI patients. Analyses confirmed significant differences in hospital stay and mortality between DILI and non-DILI groups.
Conclusion: The study highlights the need for improved monitoring and prevention strategies for DILI in neonates and infants, given the significant prevalence among drugs of interest and the associated increased mortality and hospital stay.

TREATMENT OF MILD TO MODERATE PEDIATRIC ANEMIA IN THE AFRICAN REGION: A SYSTEMATIC REVIEW. Kate-Lynn Garst, Mary Sweeney, Emily K. Flores. Bill Gatton College of Pharmacy, East Tennessee State University.
Introduction: According to the World Health Organization (WHO), the African Region has the largest prevalence of pediatric anemia in the world at 60.2% in 2019. Pediatric anemia can lead to poor nutrition, delayed development, and stunted growth; however, singular, clear guidance does not exist for outpatient management in the African Region. We seek to describe current approaches for safe and effective outpatient management of mild to moderate pediatric anemia in the African region.
Methods: Systematic review followed PRISMA guidance and was registered through PROSPERO. PubMed, CINHAL, WHO African Index Medicus, Web of Science, and Cochrane CENTRAL were searched. Search terms of "Anemia," "Africa," "Anemia, Iron Deficiency" were utilized with results limited to the English language, the African Region, pediatric populations, outpatient setting, mild to moderate anemia, and published after 2000.Articles were excluded if conducted outside of the African region (as defined by the WHO), included pregnant population, lacked discussion of treatment intervention, or focused on inpatient treatment of severe anemia. Literature search yielded 624 articles, and after primary and secondary review 32 articles were included for analysis. Each article was screened for bias with either the Newcastle-Ottawa scale for case controls or Modified Downs Black for randomized and non-randomized studies. During primary review, data points such as objectives, inclusion and exclusion criteria, interventions and comparators, patient setting, baseline, and endpoint hemoglobin were extracted. Secondary review was utilized to confirm the data extracted and establish consensus on bias scoring.
Findings: Multiple themes for the treatment of mild to moderate iron deficiency anemia have emerged. Themes include utilization of different iron formulations, inclusion of additional vitamins, use of multiple micronutrient powders, school-based programs, deworming protocols, and evaluation of comorbid infections such as malaria. Presented findings will expand upon these themes.
Conclusion: Systematic review results will be utilized to develop an implementable protocol that can be distributed to healthcare providers in the African region for safe and effective care of children with anemia.

TRENDS IN DOSAGE FORMS FOR PEDIATRIC APPLICATIONS. Stephanie Ekufu, Joslin Bawek, Ochain Okey. University of Iowa College of Pharmacy
Introduction: Pediatric patients require medications tailored to their unique needs based on their physiological and developmental characteristics. To meet specific needs, a variety of dosage forms have emerged for pediatric medical use. Each of these forms comes with its own set of advantages and disadvantages, addressing the practical challenges of ensuring accurate dosing and enhancing adherence in pediatric patients. Despite liquid oral dosage formulations being commonly used within this population, oral solid dosage formulations are preferred for pediatric drug delivery. The purpose of this project is to examine the types of oral dosage formulations used in pediatric clinical trials and those ultimately newly approved for pediatric drug delivery to assess if there are age-appropriate oral solid dosage formulations for the pediatric population.
Methods: Data in this study includes drugs that were FDA-approved for pediatric use between 2019-2023. Clinical trials obtained for specific medications were assessed whether they had an oral solid dosage form as one of the drug formulations. Clinical trials evaluated includes a study protocol that ensures information on dosing and other inclusion criteria for subjects were available. Data collected includes age group

Student Research (Con't)

studied, size of the dosage form studied, as well as manufacturer, indication, dosage form approved for use, and weight requirement for dose, if applicable.

Results: There were a total of 60 clinical trials for FDA-approved drugs for pediatric use. Tablets (41%) and suspensions (21%) were the most common dosage form studied in clinical trials, with tablets greater than 3 millimeters in size being the most common solid oral dosage form. Granules (7%), chewable tablets (2%), and pellets (2%) were the least common solid oral dosage form studied in these clinical trials. The number of suspensions studied stopped growing after age group of 3 years and older, with the number of tablets studied growing significantly at age group of 3 years and older. Out of the studied oral dosage forms, only 12.5% of drug products were classified as sprinkles (pellets and granules), less than 3 millimeters in size.

Conclusions: Majority of pediatric drugs studied and approved within the 5-year time period are tablets greater than 3 millimeters, which may not be appropriate due to swallowability issues. Sprinkles offer advantages including ease of swallowing, effective taste-masking, and flexibility in dose adjustments. Utilizing specialized dosage forms, such as sprinkles and mini tablets, can provide safer and more effective therapy options, as well as contribute to the improved well-being of this unique population.