2018 ACCP Updates in Therapeutics

In 2018 ACCP Updates in Therapeutics, the following errors were published in the meeting title and section headings of the Abstracts.

- Page e29, leftmost part of the page
  The meeting title “ACCP Updates in Therapeutics 2018 May 23–24, 2018” should have read:
  ACCP Updates in Therapeutics 2018
  Patient-Centered Team-Based Practice Forum
  February 16–18, 2018

- Page e29, first Abstract section heading
  The section heading “UT CLINICAL PHARMACY FORUM” should have read “CLINICAL PHARMACY FORUM ABSTRACTS”

- Page e30, bottom right of the page, second Abstract heading
  The section heading “UT ORIGINAL RESEARCH” should have read “ORIGINAL RESEARCH ABSTRACTS”

We apologize for these errors.

Reference
AMBULATORY CARE
S-7E. Developing a Fidelity Assessment System for Comprehensive Medication Management Service. Caitlin K. Frail,1 Carrie Blanchard,2 Melanie Livet,3 Caryn Ward,4 Todd D. Sorensen,1 Mary Roth McClurg,5; 1Pharmaceutical Care and Health Systems, University of Minnesota College of Pharmacy, Minneapolis, MN 2UNC Eshelman School of Pharmacy, Chapel Hill, NC 3UNC-Chapel Hill, Eshelman School of Pharmacy – CMOPP, Chapel Hill, NC 4FPG Child Development Institute, UNC-Chapel Hill, National Implementation Research Network, Chapel Hill, NC

S-6. Mapping Ambulatory Pharmacy Services: A Strategy to Create a Shared Vision and Enhance Comprehensive Medication Management in an Academic Medical Center. Kelly Cochran,1 Bushra Muraywid,2 Julia Chisholm,3 Laura Butkевич,4; 1Division of Pharmacy Practice & Administration, University of Missouri-Kansas City School of Pharmacy at MU, Columbia, MO 2University of Missouri Health Care, Columbia, MO
SERVICE OR PROGRAM: University of Missouri Health Care is a health system with five hospitals and over 50 primary and specialty clinics. The Pharmacy Services department is developing strategies and organizational structure to optimize delivery of comprehensive medication management (CMM) in the ambulatory care setting where over 600,000 patient visits occur annually. The health system contains nine retail pharmacies offering pharmacist consultation and vaccination services. Current structure includes clinical pharmacist presence at three primary care clinics and at the oncology clinic. Specialty pharmacists are integrated within several medicine specialty clinics. Virtual comprehensive medication reviews are provided to select patients at all primary care clinics. Pharmacist managed anticoagulation services are delivered through a phone-based service. A pharmacist and pharmacy technician team is also involved in transition of care management at discharge from hospital, including a medication bedside delivery program.
JUSTIFICATION/DOCUMENTATION: A 1-day ambulatory care summit was held to develop a cohesive vision for ambulatory care pharmacy services within the health system. The summit allowed participants to map current clinical activities, practice locations, tools utilized, and identify key stakeholders. Mapping revealed fragmentation among ambulatory pharmacy services. Through the summit, next steps were identified to ensure complementary activities and communication.
ADAPTABILITY: Opportunities to adapt this mapping strategy to foster efficient communication, develop a shared vision, and align ambulatory pharmacy services may exist across health systems. Analysis of CMM activities serves as a catalyst to advance pharmacy practice, outline resource needs, and identify key interdisciplinary stakeholders.
SIGNIFICANCE: An in-depth, collaborative outline of current ambulatory care pharmacist activities allows the pharmacy team to define and deliver services under a unified vision. This also allows for optimization and advancement of resources, both information technology and clinicians. Additional benefits include enhanced collaboration across the department. Furthermore, a unified and consistent department allows for better relationships with physicians and the interdisciplinary clinic team.

S-SE. The Role of Improvement Cycles in Scaling Up Delivery of Comprehensive Medication Management (CMM) in Primary Care Settings. Melanie Livet,1 Lindsay Sorge,2 Carrie Blanchard,3 Caryn Ward,4 Mary Roth McClurg,5 Todd D. Sorensen,6; 1UNC-Chapel Hill, Eshelman School of Pharmacy – CMOPP, Chapel Hill, NC 2Pharmaceutical Care and Health Systems, University of Minnesota College of Pharmacy, Minneapolis, MN 3UNC Eshelman School of Pharmacy, Chapel Hill, NC 4FPG Child Development Institute, UNC-Chapel Hill, National Implementation Research Network, Chapel Hill, NC
Presented at the American College of Clinical Pharmacy Annual Meeting, Phoenix, AZ. October 2017.

HIV/AIDS
F-12. Implementation of Daily Pharmacist Review of Patients Receiving Antiretroviral Therapy at an Eleven-Hospital Health System. Andrea Pallotta, Elizabeth Neuner; Department of Pharmacy, Cleveland Clinic, Cleveland, OH
SERVICE OR PROGRAM: Antiretroviral therapy (ART) for treatment of patients with HIV infection can be complex and prone to medication errors during hospitalization. In an effort to minimize errors and provide excellent patient care, Cleveland Clinic Health System (CCHS), implemented a daily infectious diseases (ID) pharmacist review of all patients receiving ART. This includes monitoring drug-drug interactions, regimen accuracy and completeness, renal/hepatic dosing, opportunistic infection prophylaxis/treatment. Patients automatically populate a list in the electronic health record (EHR). An initial note is placed in the EHR, and daily review using a standardized template is documented in the pharmacy intervention system. Monthly intervention numbers are tracked and reported.
JUSTIFICATION/DOCUMENTATION: The initiative was developed in accordance with American College of Clinical Pharmacy opinion paper on acute care management of the HIV-infected patient. Prior to implementation, a retrospective review determined the admission rates and pharmacist time commitments. Across CCHS, the average admissions with ART per week ranged from 0.5 to 6 with estimated pharmacist time commitment of 5–30 minutes/day. Directors of Pharmacy approved the service.
ADAPTABILITY: CCHS antimicrobial stewardship program (ASP) is comprised of 10 ID pharmacists across 11 hospitals. ID pharmacists/residents perform service remotely through the EHR and/or mentor non-ID pharmacists at hospitals without ID pharmacists. A process and clinical guide were developed as training materials. Adaptations to initial roll-out include improving patient identification in EHR and inclusion in external prospective-audit and feedback alert system.
SIGNIFICANCE: The service highlights the skills ID pharmacists can provide this patient population. The daily ART review started at the main campus hospital in 2011 and showed improved time to error resolution and number of medication errors after implementation. Expanding the service will mirror these results in a larger patient population.

Infectious Diseases
F-11. Impact of an Antimicrobial Stewardship Program at a Community Teaching Hospital. Elias Chhibber, Rita Chamoun, AnneMarie Blake, Thica Tran, Catherine Harrington; Lloyd L. Gregory School of Pharmacy, Palm Beach Atlantic University, West Palm Beach, FL
SERVICE OR PROGRAM: A team of infectious diseases physicians, pharmacists, and trainees implemented an Antimicrobial Stewardship Program (ASP) at a 233-bed community teaching hospital in December 2014. The program’s strategies were infectious diseases consult services and restrictions on the use of cefazolin, colistin, daptomycin, etraphenam, linezolid, meropenem, micafungin, and tigecycline.

JUSTIFICATION/DOCUMENTATION: The days of therapy (DOT) per 1000 patient days (PD) for all restricted antimicrobials decreased significantly. The DOT/1000 PD for meropenem were 39 in 2013, 40 in 2014, 22 in 2015, and 21 in 2016 demonstrating a statistically significant decline between 2014 and 2015 (difference 18, 95% CI, 15.32–20.74; p<0.0001). The DOT/1000 PD for several non-restricted antimicrobials also decreased significantly. The DOT/1000 PD for piperacillin/tazobactam were 118 in 2013, 131 in 2014, 86 in 2015, and 92 in 2016 demonstrating a statistically significant decline between 2014 and 2015 (difference 45, 95% CI, 40.30–48.52; p<0.0001). The DOT/1000 PD for vancomycin were 123 in 2013, 130 in 2014, 109 in 2015, and 105 in 2016 demonstrating a statistically significant decline between 2014 and 2015 (difference 21, 95% CI, 15.88–24.50; p<0.0001). The ASP resulted in approximately $234,176 in cost savings per year. The inappropriate use of antimicrobials leads to an increase in antimicrobial resistance, adverse effects, and cost. Pharmacists are well positioned to collaborate with infectious diseases physicians, pharmacists, and trainees can result in a significant decrease in antimicrobial utilization at a community teaching hospital. An educational program was requested by and delivered at a neighboring community hospital.

SIGNIFICANCE: The inappropriate use of antimicrobials leads to an increase in antimicrobial resistance, adverse effects, and cost. Pharmacists are well positioned to collaborate with infectious diseases physicians to implement effective ASPs that meet regulatory requirements.

Peri-Operative Care

S-26. Standardization of Orthopedic Residents’ Knowledge of Post-Operative Anticoagulant Management Through a Knowledge Translation Intervention by Pharmacists. Vivian Law,1 Priscilla Rubio-Reyes,1 Norman Dewhurst,2 Sarah Ward,3 Orthopedic Surgery, St. Michael’s Hospital, Toronto, ON, Canada Pharmacy, St. Michael’s Hospital, Toronto, ON, Canada

SERVICE OR PROGRAM: In Aug. to Nov. 2017, orthopedic pharmacists at St. Michael’s Hospital (Toronto, Canada) developed and delivered a 15-min case-based presentation to orthopedic surgery residents regarding post-operative anticoagulant management. We developed a test including nine case-based multiple choice questions and three questions rating self-confidence. The test was administered immediately pre- and post the presentation. Twelve residents completed the test. The results were used to evaluate the impact of the education intervention on both knowledge and confidence levels in orthopedic surgery residents.

JUSTIFICATION/DOCUMENTATION: The aim of this quality improvement study was to identify the existing care gap and explore different interventions to improve orthopedic residents’ adherence to best practice recommendations for anticoagulants. Based on a root cause analysis and discussion with residents, our first intervention was an educational program. Differences in the pre/post-test were evaluated using the one-sample signed rank test. The mean scores from the pre- and post-tests increased significantly by 10.68 (95% CI, 8.98–12.38; p<0.0001). The test was a non-significant increase in confidence [0 = not confident, 1 = little, 2 = some, 3 = fairly, 4 = very] from 2.42 to 2.75 (p=0.313).

ADAPTABILITY: The educational intervention was based on therapeutic recommendations from the American College of Chest Physicians guidelines and Thrombosis Canada recommendations for antithrombotic therapy. Pharmacists are highly trained medication experts and can assist in knowledge translation of guideline recommendations to practical use. Within busy hospital environments, 15-min interactive education presentations are feasible and effective for orthopedic resident learning.

SIGNIFICANCE: An educational program delivered by pharmacists to orthopedic residents can significantly increase anticoagulant knowledge, however further opportunity for improvement exists. A trend toward increased confidence levels was seen. To our knowledge, this is the first study to evaluate the impact of an orthopedic pharmacists’ knowledge translation program to improve knowledge and confidence levels of orthopedic surgery residents, with the goal of improving patient outcomes.

Women’s Health

F-47. New Inpatient Service Initiated by Clinical Pharmacists in Postnatal Care within Qatar. Yehia El Khawy,1 Raja Barazi,2 Tarek Ibrahim,3 Mohamed Alloub,4 Tamara Salama Fady Al Shdadaf,4 Wesam Smidi,5 Rasha El Enany,2 Amy Ann Mathew,7; 1Department of Obstetrics & Gynecology, Hamad Medical Corporation (HMC) Qatar, Doha, Qatar 2Pharmacy Department, Hamad Medical Corporation (HMC), Doha, Qatar 3Clinical Pharmacy, Al-Wakra Hospital: Hamad Medical Corporation, Al-Wakra, Qatar 4OBstetrics and Gynecology Department, Hamad Medical Corporation (HMC), Doha, Qatar 5Department of Nursing, Obs/Gyn Unit, Hamad Medical Corporation (HMC) Qatar, Doha, Qatar 6Department of Pharmacy, Hamad Medical Corporation (HMC), Qatar, Doha Qatar, Qatar 7Department of Clinical Pharmacy, Hamad Medical Corporation (HMC), Qatar, Doha Qatar, Qatar

SERVICE OR PROGRAM: The provision of immediate post-partum contraception counseling service, according to ACOG practice guidelines, is an important component in improving the quality of postnatal health care. Currently in our setting, postpartum women interested in contraception are referred to the Family Planning Clinic which may take approximately 6 weeks. This delay in initiating contraception may place patients at risk of conceiving within a short IPI. This service was initiated with a vision to reach all postpartum patients and educate them about all contraceptives and time to start it, prior to discharge. The service was conducted by two clinical pharmacists in a specific room beside patient rooms to provide patient-centered care and privacy.

JUSTIFICATION/DOCUMENTATION: A total of 795 patients were counseled in the service. The average time of each session was 16 min. A cross section survey evaluating patient’s satisfaction was voluntarily completed by 100 patients. Based on this survey, 97–100% of the patients agreed that the clinical pharmacist answered their questions regarding contraception, and the healthcare professional clearly explained all birth control options including possible side effects, missed doses, drug interactions and guided them in choosing a suitable contraceptive method. This patient-centered counseling service had provided patients with a better experience as well as increased their knowledge about contraception.

ADAPTABILITY: The inpatient counseling service provides an important opportunity to improve postnatal care. Our service is the first initiative in GCC, to address the need for inpatient contraception service. This may motivate other institutions to evaluate their current process and justify the need for a clinical pharmacist to be involved throughout the continuum of postnatal care.

SIGNIFICANCE: We continue to positively impact postnatal care outcomes, allowing for further expansion of clinical pharmacist-provided services. Furthermore, this newly established service has the potential to reduce OPD appointments, the rate of short IPIs, and save the hospital additional expenses.

UT ORIGINAL RESEARCH Ambulatory Care

S-4E. Assessing Fidelity through a Comprehensive Medication Management Self-Assessment Tool. Carrie Blanchard,1 Caitlin K. Frail,1 Kylee Funk,2 Melanie Livet,3 Caryn Ward,4 Todd D. Sorensen,2 Mary Roth McClurg,3 Rebecca Sorge,2 Mary Roth McClurg,3, 1Pharmacy Practice, Long Island University, Brooklyn, NY 2Pharmacy, Methodist LeBonheur Healthcare, Memphis, TN 3Department of Pharmacy, Methodist LeBonheur Healthcare, Memphis, TN INTRODUCTION: Amiodarone and sotalol are effective antiarrhythmic drugs (AAD) complicated by serious adverse drug events (ADE) for which specific monitoring is required. Sotalol has renal dosing limitations and risk of QTc prolongation, while amiodarone warrants monitoring to limit serious long-term ADEs. A previous retrospective study showed poor monitoring with these high-risk agents. Subsequently, standardized orders were implemented to improve patient safety.

RESEARCH QUESTION OR HYPOTHESIS: Standardized orders to facilitate appropriate monitoring will improve AAD patient safety.

STUDY DESIGN: Retrospective assessment of AAD monitoring before and after implementation of standardized orders. METHODS: A previous retrospective study (Group 1) demonstrated poor compliance with recommended monitoring of amiodarone and sotalol. After implementation of standardized orders (Group 2) and excluded if therapy was short term intravenous use or ≤1 month. Groups were compared noting adherence to recommended baseline and follow-up monitoring or discontinuation due to ADEs.

RESULTS: Baseline amiodarone monitoring improved after implementation of standardized orders (n=100 Group 1; n=42 Group 2). Statistically significant improvements were noted in
thyroid function (p=0.023), chest x-ray (p=0.048), and pulmonary function tests (p=0.001) with trends for improvement in liver function tests and electrocardiograms. For sotalol, 93 veterans (Group 1) were compared to 22 veterans (Group 2). Statistically significant improvements were seen with baseline QTc (p=0.05) and serum magnesium (p=0.01). Trends toward improvement for follow-up monitoring for both AADs were present. Nine sotalol patients (Group 1) experienced ADEs with 6 requiring discontinuation compared to zero in Group 2.

CONCLUSION: Implementation of amiodarone and sotalol standardized orders improved baseline monitoring in veterans. Preliminary evaluation of development of ADEs suggests that appropriate monitoring leads to improved patient safety and less ADEs.

S-14. Determinants of Self Care Practices among Hypertensive Patients at Jimma University Specialized Hospital, Southwest Ethiopia. Bucha Gemeda,1 Muktar Ahmed,2 Fekele Bekele,1 Pharmacy, Jimma University, Jimma, Ethiopia 1Epidemiology, Jimma University, Jimma, Ethiopia

INTRODUCTION: Hypertension is the most common chronic condition and most patients with hypertension have other risk factors. About one third of adults in the world have hypertension. Even though pharmacotherapy is considered first line treatment of hypertension, self-care practices should be encouraged for all patients, whether they are in pre-hypertensive or hypertensive stage.

RESEARCH QUESTION OR HYPOTHESIS: What is the prevalence and determinants of self-care practices among hypertensive patients at Jimma University Specialized Hospital.

STUDY DESIGN: Hospital based cross-sectional study was conducted from April 4 to May 30, 2016 at ambulatory care unit of Jimma University Specialized Hospital.

METHODS: Participants were recruited consecutively. A structured questionnaire was prepared and used to obtain information. Data was entered and cross-checked using Epi data version 2.0 and exported to the SPSS version 21.0 for analysis. The logistic regression model was used to analyze any association between dependent variable and independent variables. Statistical significance was considered at p-value <0.05.

RESULTS: A total of 341 hypertensive patients participated in the study. About 61.9% respondents were adherent to medication usage and 44.9%, 88.3%, 93.5% and 56.9% of respondents were adherent to physical activity, non-alcohol drinking, nonsmokers and weight management, respectively. Normal weight (AOR = 1.822, 95% CI: 1.073-3.093) was independent predictor of medication usage whereas good self-efficacy (AOR = 2.584, 95% CI: 1.477-4.521) and being female (AOR = 0.517, 95% CI: 0.301-0.887) was independent predictor of low salt diet and physical activity respectively while college/above education (AOR = 0.239, 95% CI: 0.063-0.908) was inversely related with non-alcohol use. Self-efficacy was independent predictor of self-care practices of medication usage, low salt diet and weight management.

CONCLUSION: Self-care practices of hypertensive patients, especially behaviors related to low salt diet (30.5%), physical activity (44.9%), medication usage (61.9%) and weight management (56.9%) were generally low whereas self-care practices related to non-alcohol use and non-smoking are relatively promising. Health professions should educate hypertensive patients on self-care practices at regular bases.

Critical Care

S-22E. Fluid Resuscitation in End Stage Renal Disease Patients Presenting with Sepsis. Khalida Amini,1 Erika Weidman,2 Heather Nix,3 Andrea Thurman,4 Sean Nix,5 1Assistant Professor, School of Pharmacy, Hampton University, Hampton, VA 2Pharmacist, Critical Care Unite, Riverside Regional Medical Center, Newport News, VA 3Pharmacist, Eastern Virginia Medical School, Norfolk, VA 4Pharmacist, Critical Care and General Surgeon, Riverside Regional Medical Center, Newport News, VA 5Pharmacist, College of Osteopathic Medicine, Blacksburg, VA

RESULTS: The analysis showed that only 40% of pharmacists supplied OTC medicines according to EBM. Additionally, logistic regression analysis showed that only two questions asked predicted the correct supply of OTC medicines (Q1: describe your symptoms, Q2: when did the symptoms start?). The two questions has significant p values: 0.022 and 0.023 respectively. The focus groups analysis has identified a range of 29 factors, some were facilitators such as established patient-pharmacist relationship, some were barriers such as conflicts between available evidence, and some were acting as both facilitator and barrier such as patient awareness and education.

CONCLUSION: Given the fact that OTC supply is a core function for pharmacists, this study showed a low OTC supply according to EBM. Furthermore, this study identifies several factors explaining this phenomenon. Targeting factors identified in this study might help change this behavior and decrease unwanted events.

Education/Training

F-1. Introduction of Anxiety-Reducing Strategies to Manage Student Anxiety Associated with Participating in American Pharmacists Association Pharmacy-Based Immunization Delivery Certificate Training. Malgorzata Slugocki,1 Ayse Elif Oztener,2 Georgeta Vadican,3 Fairleigh Dickinson University, School of Pharmacy and Health Sciences, Florham Park, NJ

INTRODUCTION: In the past students experienced anxiety when participating in American Pharmacists Association (APhA) Pharmacy-Based Immunization Delivery certificate training due to trypanophobia. In order to address this problem, our institution incorporated an educational component on strategies to manage trypanophobia.

Community Pharmacy Practice

S-45. Evidence Based Supply of Over the Counter Medicines in Community Pharmacies. A Mixed Methods Study. Hind Aboheimed,1 Arej Alhumus,1 Nada Alobaid,2 Ghada Abosheim,3 Nouf Aloudah,2 Noura Aboheimed,2,3 1King Saud University, Riyadh, Saudi Arabia 2Kingston, ON, Canada 3King Saud University, Riyadh, Saudi Arabia

INTRODUCTION: Despite current studies that showed community pharmacists had a positive attitude toward evidence based medicine (EBM) supply of OTC medicines, there is a lack in EBM practice in community pharmacies.

RESEARCH QUESTION OR HYPOTHESIS: To assess and explore EBM in supplying OTC medicines for three minor ailments: diarrhea, cough, common cold by community pharmacists in Saudi Arabia.

STUDY DESIGN: Mixed methods study.

METHODS: The study used a mixed methods approach consisted of two parts. The quantitative study which used a mystery shopper approach for 214 randomly selected pharmacies from Riyadh region using 14 questions-Quest Scholar MAC checklist to examine community pharmacists’ application of EBM. Secondly, the qualitative study which encompassed three focus groups with 13 pharmacists from different community practice settings to explore factors affecting EBM practice in supplying OTC medicines from the pharmacist’s point of view using theoretical underpinning designed topic guide.

RESULTS: The analysis showed that only 40% of pharmacists supplied OTC medicines according to EBM. Additionally, logistic regression analysis showed that only two questions asked predicted the correct supply of OTC medicines (Q1: describe your symptoms, Q2: when did the symptoms start?). The two questions has significant p values: 0.022 and 0.023 respectively. The focus groups analysis has identified a range of 29 factors, some were facilitators such as established patient-pharmacist relationship, some were barriers such as conflicts between available evidence, and some were acting as both facilitator and barrier such as patient’ awareness and education.

CONCLUSION: Given the fact that OTC supply is a core function for pharmacists, this study showed a low OTC supply according to EBM. Furthermore, this study identifies several factors explaining this phenomenon. Targeting factors identified in this study might help change this behavior and decrease unwanted events.
RESEARCH QUESTION OR HYPOTHESIS: Our study assessed whether the introduction of anxiety-reducing strategies in the immunization certificate training helped students overcome trypanophobia.

STUDY DESIGN: This was a pre- and post- prospective survey-based cohort study.

METHODS: Pre- and post-surveys were administered before intramuscular and subcutaneous injection instruction and after completing the injections in the final assessment of the certificate training, respectively. The surveys contained 5-point Likert scale questions measuring student fear regarding administering and receiving injections. Before completing the final injection, the students watched a lecture presentation that coached them on various techniques that can reduce anxiety: behavioral interventions (breathing, mindfulness), applied tension, and exposure-based therapy. The results from the pre- and post-survey were analyzed using Mantel-Haenszel Chi-Square method. Statistical significance was defined as p-value of ≤ 0.05.

RESULTS: In the pre-survey, in response to the statement of whether they are afraid to receive the injection but not administer the injection, 24% of 71 students strongly agreed/agreed versus 48% strongly disagreed/disagreed. In the post survey, 14% of students strongly agreed/agreed with the same statement versus 69% of students strongly disagreed/disagreed (p value=0.05). In the pre-survey, in response to the statement of whether they are afraid to administer the injection but not receive the injection, 27% students strongly agreed/agreed versus 53% strongly disagreed/disagreed. In the post survey 13% of students strongly agreed/agreed with the same statement versus 75% of students strongly disagreed/disagreed (p value=0.03).

CONCLUSION: The introduction of anxiety-alleviating techniques into the curriculum helped students overcome their anxiety and reduce the fear of administering and receiving subcutaneous and intramuscular injections.

F-9. Integrating Continuous Quality Improvement (CQI), Teamwork, and Leadership into a New Curricular Elective. Lara Kerwin,1 Lindsay Sorge,2 Todd D. Sorensen,3 Kristin K. Janke,3,1 Department of Pharmacy Practice, Division of Ambulatory Care, St. Louis College of Pharmacy, St. Louis, MO 2Department of Pharmaceutical Care & Health Systems, University of Minnesota College of Pharmacy, Minneapolis, MN 3Pharmaceutical Care and Health Systems, University of Minnesota College of Pharmacy, Minneapolis, MN

INTRODUCTION: There is a call for quality improvement (QI) education into Pharm.D. curricula. Present instruction is predominantly lectures within courses, although hands-on application is historically more effective. QI education in pharmacy tends toward medication safety and quality assurance rather than QI principles and how to improve quality. QI experts urge healthcare educators to teach continuous quality improvement (CQI) skills alongside leadership and teamwork. Yet, this design is scarcely reported.

RESEARCH QUESTION OR HYPOTHESIS: How should an elective in CQI be designed, implemented, and evaluated for students to develop a CQI mindset to participate in QI initiatives?

STUDY DESIGN: One pharmacy resident and three professors outlined course goals, objectives, values, and structure over approximately 6 months (April 26, 2016-January 16, 2017). Assignments were developed for practice authenticity, context to pharmaceutical care, and designed to support growth in a non-threatening environment.

METHODS: Evaluation included a Likert-based questionnaire and two-round modified-Delphi process via Qualtrics. Qualtrics Labs Inc., Provo, UT. Round one asked open-ended questions about benefits and improvements for four major course activities. Round two grouped responses, then assessed consensus (set prospectively at 75%).

RESULTS: Eight third-year Pharm.D. students completed the course (January 17, 2017–April 11, 2017). Five students completed traditional evaluations; all respondents reported a CQI mindset resulting from the course (100%). All eight students completed both Delphi rounds. Eleven areas of benefit and sixteen improvements were described with consensus attained for five benefits (45.5%) and one improvement (6.25%).

CONCLUSION: An elective in CQI, teamwork, and leadership allowed students to build a CQI mindset (i.e. real-world context, relevance, and application of course material). Future offerings should maintain a discussion-based style and CQI project and storytelling elements.

F-S. Measuring the Effect of Implementing Standardized Flashcards as a Study Tool in a Pathophysiology Class. Erin K. Hennessy,1 Mackenzie T. Steck,2 Erica F. Crannage,2 Andrew J. Crannage,1 Theresa Prosser,3 1St. Louis College of Pharmacy/Mercy Hospital St. Louis, St. Louis, MO 2St. Louis College of Pharmacy, St. Louis, MO

INTRODUCTION: Self-testing is a method to practice the skill of content retrieval. Studies show that retrieval practice is not part of the studying process for most students. Reasons include lack of awareness of benefits and time necessary to create self-testing materials like flashcards. Pathophysiology a content heavy course requiring significant factual memorization. The purpose of this project was to assess if providing students with a convenient method of self-testing in the form of electronic flashcards would enhance retrieval ability.

RESEARCH QUESTION OR HYPOTHESIS: Do electronic flashcards enhance student performance and ability to retrieve information in a pathophysiology course?

STUDY DESIGN: Retrospective cohort design

METHODS: Students registered for Pathophysiology in 2016 who provided consent and a Quizlet® username were included. Quizlet® was chosen as the electronic flashcard medium for the project based on cost and usability. Flashcard sets were created for each disease state topic. Data on flashcard utilization by students was collected from Quizlet®. Remembering level multiple choice questions were identified for each of four exams and a score was calculated for those questions. The primary outcome was to evaluate for correlation between number of flashcard sets studied and overall student performance on remembering level multiple choice items on each exam.

RESULTS: A total of 193 students were included. Mean number of flashcard sets studied decreased each exam (2.26 ± 2.58, 1.21 ± 2.02, 0.68 ± 1.93, and 0.48 ± 1.59). Pearson correlation coefficients for the four exams were −0.062, 0.066, 0.031, and 0.027. The correlation coefficient for total flashcard sets studied and overall course grade was 0.089.

CONCLUSION: The number of electronic flashcard sets viewed was not correlated with improved performance on remembering level exam questions. This could be partly due to insufficient instruction on using flashcards appropriately for retrieval practice and/or underutilization. Creation and maintenance of electronic flashcards requires a large time commitment that must be weighed against the benefits of providing this resource to students.

F-3. Evaluation of Student Pharmacists’ Diabetes Knowledge after Teaching a Diabetes Self-Management Education Class. Kendra M. Manigault, Maria M. Thurston; Pharmacy Practice, Mercer University College of Pharmacy, Atlanta, GA

INTRODUCTION: There is evidence that a variety of educational experiences can positively impact a student pharmacist’s knowledge, attitudes, and/or skills associated with chronic conditions; however, there are limited studies that evaluate the impact of a student pharmacist involvement with a diabetes self-management education (DSME) class.
F-3. Impact of incorporating Advanced Pharmacy Practice Experiences into small rural hospital to expand clinical pharmacy services and Antimicrobial Stewardship Program. Quoc Hoa Hoang, Timothy Huynh; Inpatient Pharmacy, Desert Valley Hospital, Victorville, CA

INTRODUCTION: Pharmacy Colleges face the challenge of demands with limited staff support.

RESEARCH QUESTION OR HYPOTHESIS: The purpose of this study is to evaluate the impact of incorporating Advanced Pharmacy Practice Experiences (APPE) students into clinical practice and Antimicrobial Stewardship Program (ASP) to enable students to be practice-ready graduates while adding value to and expanding clinical pharmacy services at Desert Valley Hospital.

STUDY DESIGN: Single-centered, retrospective, computerized medical record review study that examined the impact of APPE students on clinical services from June 2015 to June 2017.

METHODS: A total of 4155 patients’ medical records were reviewed. Clinical recommendations/interventions based on guidelines and protocols were documented into computerized medical record and presented to physicians at clinical rounds. The primary outcomes included the number and types of recommendations/interventions approved by physician; and secondary outcome was length of hospitalization.

RESULTS: There were 3097 recommendations approved of 4023 total interventions (77%). Out of 3074 antibiotic de-escalation recommendations, 2467 were approved (80.2%). Out of 1252 IV PO recommendations, 771 were approved (61.6%). Out of 3144 dosing, renal adjustment, medication substitution recommendations, 2735 were approved (86.9%). The average length of stay for studied patients was 8 days.

CONCLUSION: Incorporating APPE students into clinical services and ASP allowing them contribute meaningfully to patient care during the length of rotation while fulfilling duties that are normally managed by a full staffed pharmacy. In the process of experiential learning, APPE students learned to fulfill both technical and clinical responsibilities to always continue enhancing quality of care.

F-4. Impact of incorporating Advanced Pharmacy Practice Experiences students into small rural hospital to expand clinical pharmacy services, and Antimicrobial Stewardship Program. Hoang, Quoc, Huynh, Tim; Inpatient Pharmacy, Desert Valley Hospital, Victorville, CA

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F-5. Impact of incorporating Advanced Pharmacy Practice Experiences students into small rural hospital to expand clinical pharmacy services, and Antimicrobial Stewardship Program. Hoang, Quoc, Huynh, Tim; Inpatient Pharmacy, Desert Valley Hospital, Victorville, CA

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METHODS: A total of 4155 patients’ medical records were reviewed. Clinical recommendations/interventions based on guidelines and protocols were documented into computerized medical record and presented to physicians at clinical rounds. The primary outcomes included the number and types of recommendations/interventions approved by physician; and secondary outcome was length of hospitalization.

RESULTS: There were 3097 recommendations approved of 4023 total interventions (77%). Out of 3074 antibiotic de-escalation recommendations, 2467 were approved (80.2%). Out of 1252 IV PO recommendations, 771 were approved (61.6%). Out of 3144 dosing, renal adjustment, medication substitution recommendations, 2735 were approved (86.9%). The average length of stay for studied patients was 8 days.

CONCLUSION: Incorporating APPE students into clinical services and ASP allowing them contribute meaningfully to patient care during the length of rotation while fulfilling duties that are normally managed by a full staffed pharmacy. In the process of experiential learning, APPE students learned to fulfill both technical and clinical responsibilities to always continue enhancing quality of care.

F-2. The Relationship Between Pharmacy Work Experience and Students’ Performance on Top 200-drugs Formative and Summative Assessments. Abdilahi Mohamed, Małgorzata Słogaści; Fairleigh Dickinson University School of Pharmacy and Health Sciences, Florham Park, NJ

INTRODUCTION: Exposure to pharmacy practice setting may have a positive impact on student academic performance, based upon the assumption that students who have a direct pharmacy practice experience are more apt to grasp the comprehensive role of a pharmacist. Previously published literature suggests exposure to pharmacy practice prior to entering pharmacy school does not significantly influence the overall academic performance.

RESEARCH QUESTION OR HYPOTHESIS: The goal of this study was to evaluate student performance on Top 200 Drugs formative quizzes, summative assessment, and overall grade point average (GPA) in students with pharmacy work experience compared to students with no work experience during pharmacy school. Additionally, this study was aimed at determining which pharmacy work setting led to superior performance on the above assessments.

STUDY DESIGN: This was a retrospective survey-based cohort analysis.

METHODS: The employment status data from the class of 2016 students was collected, using an electronic survey. Scores for each quiz and for the final exam were compared between students who did and did not have work experience during pharmacy education, using the two-tailed, student’s t-test for independent samples. Comparisons between various pharmacy settings were performed using ANOVA. Statistical significance was defined as p-value <0.05.

RESULTS: The mean scores for formative assessments across all courses in which they were delivered were not statistically significant. The average score in the final cumulative assessment was 85 for students with work experience versus 86 for students without work experience (p=0.601). The overall GPA was 3.37 for students with work experience versus 3.55 for students without work experience (p=0.179).

CONCLUSION: The students with work experience during the pharmacy education had higher average scores on formative and summative assessments, as well as a higher overall GPA, but there was no statistically significant difference between the two groups.

Emergency Medicine

F-46. Single Center Cohort Describing the Use of Intravenous Phenobarbital in Conjunction with Intravenous Benzodiazepine in the Management of Acute Alcohol Withdrawal in an Urban Level One Trauma Center Emergency Department. Hoang Truong, Joyce Bensman, Mustafa Meguro, Michael Levine, Henry Kim; Emergency Department, LAC+USC Medical Center, Los Angeles, CA 3LAC+USC Medical Center, Los Angeles, CA 4Olive View Medical Center, Sylmar, CA

INTRODUCTION: Acute Alcohol withdrawal (AAW) syndrome has several treatment options with benzodiazepines (BDZs) seen as first-line therapy. In BDZ refractory cases, the addition of phenobarbital (PHB) is an effective alternative to BDZs.

RESEARCH QUESTION OR HYPOTHESIS: To evaluate hospital outcomes between the combination of intravenous (IV) PHB with BDZ versus IV BDZ alone for AAW.

STUDY DESIGN: Retrospective chart review.

METHODS: PHB and BDZ patients were matched with patients who only received BDZ between July 2014 to January 2016. Outcomes measured: heart rate (HR), respiratory rate (RR), and systolic blood pressure (SBP), BDZ and PHB doses, hospital and intensive care unit (ICU) length of stay (LOS). BDZ doses were converted to diazepam equivalents.

RESULTS: Fifty-three patients enrolled. Baseline characteristics and hemodynamics were similar between the groups. The BDZ-only group’s cumulative average BDZ dose was 45.9 mg and the
highest single dose was 50 mg. The BZD+PHB group's cumulative average BZD dose was 152.3 mg and the highest single dose was 160 mg. The highest cumulative PHB dose was 650 mg, the highest single dose was 260 mg, and an average PHB dose of 276 mg. Five patients in the BZD+PHB group (22.7%) required intubation compared to zero in the BZD-only. In the BZD-only group, nine patients (29%) required ICU admission with an average ICU LOS of 1.6 days and an average overall hospital stay of 7.1 days. In the BZD+PHB group, all 22 patients required ICU admission with an average ICU LOS of 2.5 days and an average overall hospital stay of 7.6 days.

CONCLUSION: Combination of PHB+BZD had similar hemodynamics (RR, HR and SBP) compared to patients who only received BZDs but had longer hospital and ICU LOS. Despite the dose increase of BZDs in the PHB+BZD group, the addition of PHB may provide similar outcomes compared to BZD alone.

Hematology/Anticoagulation

S-29E. Evaluation of Prothrombin Complex Concentrates for the Reversal of Liver Coagulopathy. Keri Kim,1 Mariana Malhij,2 Jeffrey Muckavage,3 Eljam Tesoro,1 1Department of Pharmacy Practice, University of Illinois Hospital and Health Sciences System, Chicago, IL, Chicago, IL 2College of Pharmacy, University of Illinois at Chicago, Chicago, IL, Chicago, IL 3University of Illinois at Chicago College of Pharmacy, Department of Pharmacy Practice, Chicago, IL. Presented at the Society of Critical Care Medicine, San Antonio, Texas, February 25–28, 2018.

HIV/AIDS

F-16E. Implementation of a Pharmacist-Led Human Immunodeficiency Virus (HIV) Pre-Exposure Prophylaxis (PrEP) Clinic. Sarah Michienzi,1 Paul Stranges,2 Renata O. Smith,1 1Department of Pharmacy Practice, Section of Infectious Diseases, University of Illinois at Chicago College of Pharmacy, Chicago, IL 2University of Illinois at Chicago College of Pharmacy, Chicago, IL. Presented at the Midyear Clinical Meeting of the American Society of Health-System Pharmacists, Orlando, FL, December 4–8, 2018.

F-15. Evaluation of HIV Curricular Content in Schools of Pharmacy Across the United States. Spencer Durham,1 R. Chris Rathburn,2 Autumn D. Bagwell,3 Kevin Farmer,4 Melissa Badowski,5 1Department of Pharmacy Practice, Auburn University Harrison School of Pharmacy, Auburn, AL 2University of Oklahoma College of Pharmacy, Oklahoma City, OK 3Vanderbilt Specialty Pharmacy, Vanderbilt University Medical Center, Nashville, TN 5Department of Clinical and Administrative Sciences, College of Pharmacy, University of Oklahoma Health Sciences Center, Oklahoma City, OK. Presented at the Midyear Clinical Meeting of the American Society of Health-System Pharmacists, Orlando, FL, December 4–8, 2018.

CONCLUSION: Wide diversity in the amount of time devoted to HIV didactic teaching existed among reporting US pharmacy schools, with some schools having minimal didactic teaching devoted to HIV and low rates of exposure to HIV patients in experiential training. Few schools have faculty who spend a substantial amount of time in direct care of HIV patients. Standards for the provision of HIV education in pharmacy schools should be established.

Infectious Diseases

F-10. Impact of Procalcitonin Monitoring on Duration of Antibiotics in Patients with Sepsis and/or Pneumonia. Elizabeth Covington,1 Stephen Eure,2 Doug Carroll,2 Christen Freeman,3; 2Department of Pharmacy Practice, Samford University McWhorter School of Pharmacy, Birmingham, AL 3DCH Regional Medical Center, Tuscaloosa, AL

INTRODUCTION: Procalcitonin (PCT) is a biomarker specific for bacterial infections versus viral or non-infectious causes. Utilizing PCT as a guide for antibiotic duration could have benefit in limiting antimicrobial overuse.

RESEARCH QUESTION OR HYPOTHESIS: Does procalcitonin monitoring reduce antibiotic duration for pneumonia and sepsis in a community hospital?

STUDY DESIGN: This study utilized a quasi-experimental design, with a retrospective control group prior to the availability of procalcitonin testing and a prospective intervention group after the availability of procalcitonin testing at a community hospital.

METHODS: Non-binding PCT algorithms were developed, approved by the infectious disease physician and Pharmacy and Therapeutics committee, and distributed to providers to provide guidance on interpreting PCT levels. The investigators actively followed PCT patients and made recommendations if necessary for prescribers to discontinue or de-escalate antibiotic therapy. The primary outcome was duration of antimicrobial therapy.

RESULTS: A total of 102 patients (51 retrospective and 51 prospective) were included in the analysis. There was no difference in mean duration of inpatient antibiotics (6.1 ± 3.9 vs. 4.7 ± 2.9 days, p=0.499). Additionally, there was no difference in the average time to antibiotic de-escalation, average hospital length of stay, or intensive care unit (ICU) LOS. PCT monitoring resulted in a 41% reduction in discharge antibiotics (63% vs 37%, p=0.009) and a 2.2 day reduction in duration of overall inpatient and post-discharge antibiotics (9.5 ± 4.5 vs. 7.3 ± 4.1 days, p=0.013). There was no difference in mortality, relapse of infection, or 30-day readmission.

CONCLUSION: Procalcitonin monitoring in patients with suspected pneumonia and/or sepsis in the community setting failed to show a reduction in duration of inpatient antibiotics after the introduction of procalcitonin monitoring. However, PCT resulted in significantly fewer discharge antibiotics and overall inpatient plus post-discharge antibiotic duration, with no detrimental effect on mortality or readmission.

F-14E. Investigating the Best Active Learning Techniques Used in Antimicrobial Stewardship Program Education. Rasha AbdelSamad Elshenawy,1 Heba-t-Allah Matar Ali Matar,2 Fatma Elzahraa Ahmed,3 Mahmoud Gamal Hassib,4 Heba Sayed Youssef,5 1FADIC, Makkah, Saudi Arabia 2FADIC, Cairo, Egypt 3FADIC, Abu-Dhabi, United Arab Emirates 4FADIC, Jeddah, Saudi Arabia 5Dubai, United Arab Emirates

Presented at Cleveland Clinic Pharmacy Symposium, Abu Dhabi, UAE, November 19-20, 2016.

Medication Safety

F-27E. Analysis of the Use of Heparin and the Related Incidence of Heparin-Induced Thrombocytopenia in a Turkish Hospital. Nibil Ahunallah,1 Aisha Abimbola,2 Yildiz Okuturlar,3 Meltem Breen,2 Hakun Kocoglu,3; 1Altinbas University, Istanbul, Turkey 2Clinical Pharmacy, Altinbas University, Istanbul, Turkey 3Internal Medicine, Dr. Sadi Konuk Education and Research Hospital, Istanbul, Turkey

INTRODUCTION: The McGeer Criteria provides standardized guidance in long-term care facilities (LTCFs) for infection surveillance. Revisions were made in 2012, making the criteria specific for both residents with and without an indwelling catheter. An informal review showed frequent lack of supporting elements for testing or treatment of UTIs at Gwinnnett Extended Care Center (GECC)- Gwinnett Medical Center (GMC) LTCF. The aim of this study was to determine if procalcitonin monitoring reduce antibiotic duration for pneumonia and sepsis in the community setting failed to show a reduction in duration of inpatient antibiotics after the introduction of procalcitonin monitoring. However, PCT resulted in significantly fewer discharge antibiotics and overall inpatient plus post-discharge antibiotic duration, with no detrimental effect on mortality or readmission.

S-35. Assessing the Impact of Antimicrobial Stewardship Program on Urinary Tract Infections at a Long-Term Acute Care Facility. Edoubsahi McGee,1 Samuel John,1 Kumar Mukherje,2 Erish Malonzo,2 Marilyn Swindall,3; 1School of Pharmacy, Philadelphia College of Osteopathic Medicine- GA Campus, Suwanee, GA 2PCOM school of Pharmacy, Suwanee, GA 3Gwinnett Medical Center, Lawrenceville, GA
INTRODUCTION: The McGeer Criteria provides standardized guidance in long-term care facilities (LTCFs) for infection surveillance. Revisions were made in 2012, making the criteria specific for both residents with and without an indwelling catheter. An informal review showed frequent lack of supporting elements for testing or treatment of UTIs at Gwinnnett Extended Care Center (GECC)- Gwinnett Medical Center (GMC) LTCF. In order to determine if procalcitonin monitoring reduce antibiotic duration for pneumonia and sepsis in the community setting failed to show a reduction in duration of inpatient antibiotics after the introduction of procalcitonin monitoring. However, PCT resulted in significantly fewer discharge antibiotics and overall inpatient plus post-discharge antibiotic duration, with no detrimental effect on mortality or readmission.
Published in The Journal of Clinical and Experimental Investigati-

Nephrology
S-28E. Occurrence of Hypophosphatemia Following IV Iron Treatment: Results from a Randomized Controlled Trial. Myles Wolf,1 William Strauss,2 Kristine Bernard,2 Naomi Dahl,2 Robert Kaper,1 Julie Krop,2 1Duke University, Durham, NC 2AMAG Pharmaceuticals, Inc., Waltham, MA

CONCLUSION: Stopped or rates were decreased in three patients. Adverse events were noted in five patients and therapy was

RESULTS: Pain scores from the start of lidocaine was 5.14 hours and rent lidocaine and ketamine infusions.

INTRODUCTION: Ketamine and lidocaine have promising roles in pain management in the intensive care unit (ICU) due to a lack of respiratory depression. The safety and effectiveness of concurrent infusions as an adjunct for pain in the ICU setting have not been well studied.

RESEARCH QUESTION OR HYPOTHESIS: The aim of this study was to evaluate concurrent use of ketamine and lidocaine for the treatment of pain in postsurgical ICU patients.

STUDY DESIGN: This is a retrospective case series of ICU patients who received ketamine and lidocaine for any duration as an adjunct to opioids during ICU stay from March 2014 to March 2015.

METHODS: The primary outcomes included the time measurement to achieve a ≥20% reduction in pain scores after the initiation of lidocaine and the difference in opioid requirements pre and post concurrent pain therapies. Ketamine/lidocaine dosage, duration, and adverse events were also collected.

RESULTS: A total of 7 postsurgical ICU patients with a mean age of 51 years were included. Patients received lidocaine at an average rate of 0.85 mcg/min for a mean duration of 35 hours and ketamine at an average rate of 7.35 mcg/kg/min for a mean duration of 77.66 hours. The mean time to a ≥20% reduction in pain scores from the start of lidocaine was 5.14 hours and 15.35 hours for ketamine. The median IV morphine dose equivalents required during 6 hours pre-lidocaine/ketamine were higher than posttreatment time at 6 hours (69.9 mg vs. 59.59 mg). Adverse events were noted in five patients and therapy was stopped or rates were decreased in three patients.

CONCLUSION: This report suggests that ketamine and lidocaine effectively decreased pain scores, but adverse effects were noted in five out of seven patients. Additional and larger studies are warranted to confirm the safety and efficacy while using concurrent lidocaine and ketamine infusions.

Pharmacoeconomics/Outcomes
S-34. Cost-Benefit Analysis of Pharmacist-led Anticoagulation Clinic. Daniel Jenkins, Lodge Bliznesky, Jacob Ferguson, Aubrie Gaydosh, Aaron Stewart, Dillon Buechel; Trinity Medical Center, Steubenville, OH

INTRODUCTION: Bleeding is the primary concern in patients on warfarin therapy with bleeding rates being influenced by a variety of factors. Maintaining a therapeutic level of anticoagulation requires monitoring of patients’ PT/INR and making appropriate changes in therapy. Management of warfarin use is associated with decreased length of stay and complications from therapy, including hemorrhages and thromboembolic events.

RESEARCH QUESTION OR HYPOTHESIS: The primary objective of this study was to determine the reimbursement rates from third parties for patients that have their PT/INR tested in the Coumadin clinic versus patients that are tested in the outpatient laboratory with consideration of cost savings.

STUDY DESIGN: No randomization or control groups were used because of the ethical dilemma of withholding treatment to patients that require strict monitoring. The measured outcomes of the provided service will be compared to the outcomes obtained from care received in the outpatient laboratory.

METHODS: A cost-benefit analysis will be utilized to assess the benefit of implementing the Warfarin clinic at the Heart Center of Trinity Medical Center. A comparison of the costs of running the service at the clinic versus laboratory testing will be made to the reimbursement from third parties of each testing site.

RESULTS: The average reimbursement from Medicare for the anticoagulation clinic vs the outpatient laboratory reimbursement was $90.30 and $8.12, respectively. Based upon the 45 patients included in the analysis, the potential benefit was $82,866.91 for the anticoagulation clinic. Decreasing the length of stay for

Pediatrics
F-36. Evaluation of Pediatric Dosing Recommendations in the Food and Drug Administration (FDA) Approved Labeling of Anti-Infective Products. Farah Raveh;1 Maria Voronina,1 Xiaomei Liu,3 Gilbert Burckart,4 Jason Moore,5 1University of Arizona College of Pharmacy, Tucson, AZ 2Massachusetts College of Pharmacy and Health Science, Boston, MA 3Office of Clinical Pharmacology, Office of Transnational Sciences, Federal Food and Drug Administration, Silver Spring, MD 4Pediatric Clinical Pharmacology Staffs, Food and Drug Administration, Silver Spring, MD 5Office of Clinical Pharmacology, Federal Food and Drug Administration, Silver Spring, MD

INTRODUCTION: In the past 15 years, three significant Acts have been passed affecting pediatric drug development: FDA Modernization Act (FDAMA), FDA Amendments Act (FDAAA), and FDA Safety and Innovation Act (FDASIA). The aims of this study were to analyze trends in pediatric labeling during this time period, to identify gaps in FDA-approved products in pediatric subpopulations, and to assess whether FDA pediatric dosing recommendations were adopted into contemporary practice.

RESEARCH QUESTION OR HYPOTHESIS: How did the passage of FDA pediatric regulations affect pediatric labeling?

STUDY DESIGN: This is a retrospective study.

METHODS: Anti-infective products studied under FDAMA, FDAAA, and FDASIA were reviewed. Products were excluded if they did not receive FDA approval and had no dosing recommendations. Antiviral products were also excluded. FDA label information was extracted using Drugs@FDA, DailyMed, and the FDA Pediatric Labeling Information Database. Dosing recommendations provided in Micromedex were used because it is a common resource for drug information in contemporary practice. Descriptive statistics was utilized to analyze the data.

RESULTS: Twenty-eight drugs met the criteria for analysis, seven of which were studied under multiple Acts. The products included 20 antibacterial agents, seven antifungal agents, and one antiparasitic agent. Seven drugs had pediatric indications approved under FDAMA, 12 under FDAAA, and 14 under FDASIA. There were 38 examined therapeutic uses of which only six included neonates. Micromedex differed from FDA labeling for six drug products: atovaquone/proguanil, levofloxacin, fluconazole, amoxicillin, clavulanate, doxycycline, and gatifloxacin.

CONCLUSION: This study showed an increase in the number of approved anti-infective products and indications in pediatrics during the studied time period. However, there is still a gap in pediatric studies in younger subpopulations, especially neonates. In general, dosing recommendations provided by Micromedex agreed with FDA labeling. When there was a difference, it was mainly due to recommendations from practice guidelines.
patients admitted for myocardial infarction by 1 day was estimated to save $4,236.46.

CONCLUSION: The pharmacist-led anticoagulation clinic can be used to help decrease readmissions to the hospital, therefore decreasing healthcare costs. Normalized reimbursement from third party payers for these services incentivizes hospitals to maintain these services and decrease 30-day readmission rates as well as length of stay.

Pulmonary

S-36. Epac Role in Regulating Asthmatic Airway Smooth Muscle Proliferation. Musaab Gari,1 Alice Gardner,1 Rana Alsafar,2 1School of Pharmacy, MCPHS University, Worcester, MA 2MCPHS University, Worcester, MA

INTRODUCTION: In asthma, remodeling of airway smooth muscle (ASM) occurs with consequent increased proliferation and hypertrophy of the muscle, causing irreversible airflow limitation and poor clinical outcomes. cAMP, a second messenger regulated by PDE enzymes, is known for controlling cellular functions such as cell proliferation. Epac, a protein with high cAMP affinity, previously, we found that proliferation signaling pathways were inhibited when treating with Epac-agonist. We aim to determine the influence of cAMP-elevating agents on Epac expression on asthmatic ASM-cells.

RESEARCH QUESTION OR HYPOTHESIS: Epac is a potential ASM proliferation regulator.

STUDY DESIGN: Asthmatic ASM-cells were grown to 80–85% confluency and growth arrested for 24 hours. Serum-starved asthmatic ASM-cells were treated with 5% FBS for 48 hours in the presence or absence of rolipram (10 μM), albuterol (2 μM), 8-CPT-2Me-cAMP (100 μM), or CE3F4 (100 μM).

METHODS: Proteins 15 μg were separated by PAGE. After transfer, the membranes were incubated overnight at 4°C with the primary antibody for Epac1 (1:500) and subsequently probed with proper secondary antibody (1:1000) for 1 hour at room temperature. Membranes were stored in the stripping buffer and re-screening with housekeeping gene GAPDH (1:3000).

RESULTS: Earlier studies have shown in subjects not responding to allopurinol monotherapy. In combination treatment showed a significantly increased proportion of adverse events in all three studies (RR = 1.84, 95% CI = 1.09–3.17, I² = 64%), however the number of withdrawals was similar across groups.

CONCLUSION: Combined lesinurad and allopurinol treatment showed a significant improvement in uric acid levels and number of gout flares compared to allopurinol only. However, the proportion of adverse events was higher in the combined regimen. This suggests that adding lesinurad to allopurinol could be useful in subjects not responding to allopurinol monotherapy.

Transplant/Immunology

F-30. The Impact of Opioid Use on Kidney Transplant Rejection: Different Sources Provide Different Answers. Zana Elmasarani,1 Nicole Pitch,2 Rachael Gilbert,2 Zachary Martin,3 Lytami Wilson,3 Dave Taber,3 Prabhakar Baliga,6 Neha Patel,7 Caitlin Mardis,2 James Fleming,2 1College of Pharmacy, Medical University of South Carolina, Charleston, SC 2Division of Transplant, Medical University of South Carolina, Charleston, SC 3College of Pharmacy, Medical University of South Carolina, Charleston, SC 4College of Medicine, Medical University of South Carolina, Charleston, SC 5Medical University of South Carolina, Charleston, SC 6Department of Surgery, Medical University of South Carolina, Charleston, SC 7Department of Pharmacy Services, Medical University of South Carolina, Charleston, SC

INTRODUCTION: The opioid epidemic has been associated with deleterious outcomes after KTx. However, the identification of opioid users has varied. We sought to understand the impact of the source of opioid data on rejection.

RESEARCH QUESTION OR HYPOTHESIS: Differing definitions of opioid users will impact their association with rejection outcomes in KTx.

STUDY DESIGN: Retrospective, single center, cohort analysis evaluating the impact of opioid use on KTx rejection between 1/2010 and 12/2016.

METHODS: Data was collected via retrospective chart review and the SureScripts pharmacy claims database. Subjects were placed into cohorts based on presence of an opioid on medication reconciliation (MR) at the time of transplant (Analysis 1) or report of an opioid Rx within 3 months prior to transplant via SureScripts (Analysis 2). Categorical variables were analyzed with Chi Square and continuous variables were analyzed using Student’s t test or Mann Whitney U, with p < 0.05 indicating statistical significance.

RESULTS: Opioid use data was available for 1,129 patients using the SureScripts database and 1,112 patients using MR. Each cohort of opioid users (n=139 (MR) and 188 (SureScripts)) were compared to non-opioid users in their analyses.

Rheumatology

F-32. The Safety and Efficacy of Lesinurad in Combination with Allopurinol versus Allopurinol Alone in Patients with Gout: A Systematic Review and Meta-Analysis. Haya Almalag, James Fleming,1 Alice Gardner,1 Rana Alsafar,2 1School of Pharmacy, MCPHS University, Worcester, MA 2MCPHS University, Worcester, MA

INTRODUCTION: Lesinurad is a selective uric acid reabsorption inhibitor approved by FDA for treatment of gout in 2015; however, its place in treatment is still unclear. The objective of this study was to assess the efficacy and safety of lesinurad and allopurinol treatment (combined treatment) in patients with gout who are non-responsive to allopurinol alone.

RESEARCH QUESTION OR HYPOTHESIS: In gout patient with inadequate control of serum uric acid (sUA) level <6 mg/dL (Pooled risk ratio [RR] = 2.50, 95% confidence interval [CI] = 2.06–3.06, I² = 25%). Two studies reported significant reductions in gout flares in combined treatment, and a non-significant difference in tophus resolution (mean difference = −0.06, 95% CI = 0.08 to −0.25, 95% CI = 0.42–1.49, I² = 83%, respectively). Compared with allopurinol only treatment, combined treatment showed a significantly increased proportion of adverse events in all three studies (RR = 1.84, 95% CI = 1.09–3.17, I² = 64%), however the number of withdrawals was similar across groups.

CONCLUSION: Combined lesinurad and allopurinol treatment showed a significant improvement in uric acid levels and number of gout flares compared to allopurinol only. However, the proportion of adverse events was higher in the combined regimen. This suggests that adding lesinurad to allopurinol could be useful in subjects not responding to allopurinol monotherapy.
On comparing baseline demographics between cohorts using MR and Sure Scripts definitions, differences in statistical significance were identified in race, ePRA, length of stay, and DGF. When analyzing primary outcomes, patients with MR opioid use had significantly more rejection at 6 months (7% vs 12%, p = 0.030), while there was no difference in 1 year rejection rates (10% vs 14%, p = 0.243). When performing the analysis using SureScripts opioid users, there were no differences between cohorts in 6 month (8% vs 7%, p = 0.936) or 1 year acute rejection (11% vs 11%, p = 0.985).

CONCLUSION: When comparing the same cohort of KTxs using 2 different definitions for opioid users, both demographics and outcomes differ. There is a need for a true definition of opioid users for clinical outcomes analyses.

F-29. Does Opioid Use Impact Readmissions after Kidney Transplant? The Source of Opioid Data Matters. Rachel Gilbert, David Taber, Nicole Pilch, Lytani Wilson, Prabhakar Baliga, Neha Patel, Caitlin Mardis, Zana Elmaasarani, Zachary Martin, James Fleming, College of Pharmacy, Medical University of South Carolina, Charleston, SC; Department of Surgery, The Medical University of South Carolina, Charleston, SC; Division of Transplant, Medical University of South Carolina, Charleston, SC; College of Medicine, Medical University of South Carolina, Charleston, SC; Department of Surgery, Medical University of South Carolina, Charleston, SC; College of Pharmacy, Medical University of South Carolina, Charleston, SC; College of Pharmacy, Medical University of South Carolina, Charleston, SC.

INTRODUCTION: The opioid epidemic has substantially increased healthcare utilization. Currently, there is no uniform source of accurate opioid use and limited data on the impact of opioids in kidney transplant (KTx) patient outcomes. Pharmacists should be at the forefront in the battle on opioids.

RESEARCH QUESTION OR HYPOTHESIS: Does using different sources of opioid use affect its association with 90-day readmissions in KTx?

STUDY DESIGN: Retrospective, single center, cohort analysis evaluating the impact of opioid use on readmissions post KTx between 1/2010 and 12/2016.

METHODS: Data was collected via chart review and the SureScripts database. Patients were placed into cohorts based on presence of an opioid on medication reconciliation (MR) at the time of transplant (Analysis 1) or report of an opioid Rx within 3 months prior to transplant via SureScripts (Analysis 2). Categorical variables were analyzed with Chi Square and continuous variables were analyzed using Student’s t test or Mann Whitney U, with p < 0.05 indicating statistical significance.

RESULTS: Opioid use data was available for 1,129 patients using the SureScripts database and 1,112 patients using MR. Each cohort of opioid users (n = 139 (MR) and 188 (SureScripts)) were compared to non-opioid users in their analyses. On comparing baseline demographics between cohorts using MR and SureScripts definitions, differences in statistical significance were identified in race, sensitization, length of stay, and DGF. Patients with MR opioid use had more 90-day readmissions than the opioid naive cohort (28 vs 38%, p = 0.017), while patients identified as opioid users in SureScripts demonstrated no difference in 90-day readmissions compared to their opioid naive cohort (29 vs 32%, p = 0.0346).

CONCLUSION: The findings from this study demonstrate that different sources of opioid use data can impact its association with healthcare utilization. An accurate source of opioid use is needed for clinical outcomes analyses.

Women’s Health

S-21. Korean Women’s Awareness, Psychological Attitude, and Knowledge on Oral Contraceptive Use. Yun Jeong Lee, Bo Hee Lee; Dankook University, Cheonan, Korea, Republic of (South).
CONCLUSION: Different protocols were used to treat HG in the hospital. Among these protocols, patients that were exposed to ondansetron have less hospitalization days with less impact on health outcome and economic. However, further studies with larger number of patients must be done to confirm this result.

S-20. Inter-Pregnancy Interval among Post-partum Women Using Contraceptives within Qatar. Yehia El Khawly,1 Tarek Ibrahim,2 Wesam Smidi,3 Rasha El Enany,3 Amy Ann Mathew,5 1Department of Obstetrics & Gynecology, Hamad Medical Corporation (HMC) Qatar, Doha, Qatar 2Clinical Pharmacy, Al-Wakra Hospital: Hamad Medical Corporation, Al-Wakra, Qatar 3Department of Pharmacy, Hamad Medical Corporation (HMC), Qatar, Doha Qatar, Qatar 4Pharmacy Department, Hamad Medical Corporation (HMC), Doha, Qatar 5Department of Clinical Pharmacy, Hamad Medical Corporation (HMC), Qatar, Doha Qatar, Qatar

INTRODUCTION: Postpartum contraception is essential to prevent unintended and closely spaced pregnancies after childbirth. The time interval, between 2 consecutive pregnancies which is called inter-pregnancy interval (IPI), is viewed as an important and modifiable risk factor for adverse birth outcomes. The American College of Obstetricians & Gynecologists (ACOG) recommend a period of at least 18 months between subsequent pregnancies, in order to reduce both infant mortality (i.e. low birth weight & preterm birth) and maternal complications.

RESEARCH QUESTION OR HYPOTHESIS: Is the IPI amongst women using contraceptives in line with the recommended interval?

STUDY DESIGN: A prospective audit.

METHODS: The audit was conducted amongst women who delivered at secondary care Hospital in Qatar from March till July 2017. Past contraception data was obtained via the clinical pharmacist interviewing the patient after obtaining their consent. IPI is obtained from Patient medical files. IPIs were calculated by subtracting the date of conception of the current pregnancy from the previous delivery. Pregnancies conceived within 18 months were classified as having a short IPI.

RESULTS: A total of 238 post-partum patients used contraceptive were included in this audit. Within this population group 44% (n=106) were taking hormonal contraceptives such as oral pills, injectable, patch, implant and hormonal intrauterine device. 20% of patients on hormonal contraceptives had an IPI < 18 months.

CONCLUSION: Despite the use of hormonal contraceptives, one in five patients had an IPI less than the recommended period. We believe the main two reasons behind the short IPI among hormonal contraceptive users within our audit, were either due to patient drug related issues (i.e. non-adherence, side effects, drug interactions, missed doses), or inadequate patient knowledge of when is the best time to conceive.