

Resident Research

2014–15



PittPharmacy

Mission

The School of Pharmacy is committed
to improving health through
excellence, innovation, and leadership
in education of pharmacists and pharmaceutical scientists,
in research and scholarship,
in care of patients,
and in service to our communities.

Values

Integrity guides our daily work. We foster:
Passion, commitment, and diligence;
Creativity and personal growth;
Collaboration and teamwork;
A culture of respect for the individual.

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Message from the Dean

Patricia D. Kroboth, PhD

Dear Members of the Resident Class of 2015,

Each and every one of you has distinguished yourself among pharmacy practitioners by completing a residency program. I congratulate you on completing this intensive year of learning—gaining pharmacy expertise and mastering elements of teaching and research that triangulate to better prepare you for your careers. As residents, you have enjoyed the best of the academic and practice worlds have to offer through the collaborations between the School of Pharmacy and its partners— The UPMC hospitals including Presbyterian, Shadyside, Western Psychiatric Institute and Clinic, St. Margaret, McKeesport, Mercy, Hamot, and Childrens' Hospital of Pittsburgh, UPMC Health Plan, Rite Aid, Giant Eagle, CVS Caremark, and the University Pharmacy of the University of Pittsburgh.

You also have another distinction: as a class of residents, you made a commitment to learning clinical research skills through the Pharmacy Residency Research Program. During your career, you will be faced again and again with clinically important questions. The skills you learned created a foundation on which to build answers—and to become tomorrow's leaders in pharmacy.

We celebrate your distinction as a pharmacist who is completing your residency in one of the largest and finest programs in the country. Because of that, your personal experience has been enriched by your peers from California, Colorado, Iowa, Massachusetts, Michigan, Minnesota, Montana, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, and Rhode Island.

You have earned one more distinction! You each have just become an alumnus of our University of Pittsburgh School of Pharmacy Residency Program and will forever be a part of our community. It is my sincere hope that you carry with you fondly, the rich experiences of this past year as you launch the next phase of your career. There has never been a better time for pharmacy.

Congratulations, good luck, and keep in touch!

Let the Pitt Residents Roar!

A handwritten signature in black ink that reads "Patricia Kroboth". The signature is written in a cursive, flowing style.

Patricia D. Kroboth, PhD

Valuing Our Partners

The University Pittsburgh School of Pharmacy values our partnerships with the University of Pittsburgh Medical Center (UPMC), the UPMC Health Plan, Rite Aid, Giant Eagle, and CVS Caremark. It is through these partnerships that the Residency Program has grown in national reputation.

The University of Pittsburgh Medical Center is ranked among the top 10 of “America’s Best Hospitals” according to the 2013 *U.S. News and World Report* rankings and is one of the leading integrated health care delivery systems in Western Pennsylvania. UPMC Presbyterian, UPMC Shadyside, UPMC Mercy, UPMC St. Margaret, UPMC McKeesport, Childrens’ Hospital of Pittsburgh of UPMC, and Western Psychiatric Institute and Clinic of UPMC participate in our residency programs.

UPMC Health Plan, the second-largest health insurer in western Pennsylvania, is owned by UPMC, an integrated global health enterprise. The integrated partner companies of the UPMC Insurance Services Division — which includes UPMC Health Plan, UPMC WorkPartners, LifeSolutions (EAP), UPMC for You (Medical Assistance), and Community Care Behavioral Health — offer a full range of group health insurance, Medicare, Special Needs, CHIP, Medical Assistance, behavioral health, employee assistance, and workers’ compensation products and services to nearly 2.5 million members.

Rite Aid Corporation is one of the nation’s leading drugstore chains with nearly 4,800 stores in 31 states and the District of Columbia, with a strong presence on both the East Coast and West Coast, and 97,000 associates. Rite Aid is the largest drugstore chain on the East Coast and the third- largest drugstore chain in the United States.

Giant Eagle Pharmacy is a leading regional pharmacy with departments in 216 Giant Eagle locations across four states. Customers with qualifying prescriptions benefit from programs including the Giant Eagle \$4/\$10 generic prescription program, free prenatal vitamins, and high-quality service from expertly trained pharmacists. Additional unique services include Specialty Pharmacy offerings, in-store immunizations, and more.

CVS Caremark is the nation’s premier integrated pharmacy services provider, combining one of the nation’s leading pharmaceutical services companies with the country’s largest pharmacy chain. CVS Caremark drives value for pharmacy services customers by effectively managing pharmaceutical costs and improving health care outcomes through its retail stores, pharmacy benefit management division, and mail service and specialty pharmacy division.

Gatti Pharmacy, located in Indiana, PA, is an innovative community pharmacy providing excellent patient care, including comprehensive medication reviews, extensive immunization services, travel medicine consults, medication synchronization and specialty packaging as well as traditional dispensing services.

University Pharmacy, located in Nordenberg Hall, is available to all University of Pittsburgh students, faculty and staff, their dependents, and the public at large. The pharmacist team offers a wide variety of patient care services including: medication therapy management, preventive and wellness care, specialized OTC selection, medication education programs in collaboration with practitioners at the Student Health Services Clinic and Counseling Center.

Pharmacy Residency Research Program

Sandra L. Kane-Gill, PharmD, MSc, FCCM, FCCP Director, Resident Research Series

The Residency Research Program at the University of Pittsburgh School of Pharmacy incorporates a structured educational series with longitudinal research working groups. This approach provides a foundation for performing research, gives appropriate mentorship, fosters interactive discussions, allows peer critiques, and individual accountability for each resident project. Within the framework of the Residency Research Program, residents are responsible for the completion of all aspects of their project, from conceptualization to final manuscript preparation, with emphasis on personal accountability for the progress of their projects. The projects completed this year were highly patient centered including topics such as medication effectiveness and safety, education, quality of care, and process evaluations. Once again this year's residents responded in outstanding fashion, demonstrating a true sense of personal ownership in their work.

The Residency Research Program requires residents to be certified in research fundamentals through the University of Pittsburgh, participate in valuable interactive lectures geared toward the scientific development and management of their projects, and learn to effectively communicate their project in both verbal and written formats. Overall, our Residency Research Program contributes to the diversity of residency training at the University of Pittsburgh Medical Center in collaboration with the University of Pittsburgh School of Pharmacy, which ultimately results in well-rounded candidates eligible for a wide range of career opportunities.

The success of this program is a result of the efforts of the working group facilitators and other major contributors: Stephanie Ballard, Kim Coley, Jim Coons, Kelly Crowley, Amy Donihi, Tanya Fabian, Steve Ganchuk, Deanne Hall, Jerad Heintz, Jamie Holowka, Heather Johnson, Trish Klatt, Sarah Moffet, Louise Oleksiuk, Rachel Ours, Heather Sakely, Robert Simonelli, Melissa Somma McGivney, and Laura Wilson. The efforts of the program directors and research mentors are greatly appreciated. Amy Seybert, chair of the Department of Pharmacy and Therapeutics, must also be recognized for her dedication to the program. We greatly appreciate the continued support of Dean Patricia D. Kroboth and Senior Associate Dean Randall Smith. We would like to thank Melissa Saul for her contributions to study design and data management for several of the retrospective database projects. We would be remiss not to mention the fine administrative support of Samantha Martin and Kathy Woodburn. Most importantly, this program is successful because of the commitment of our outstanding residents.

Mapping Elderly Pennsylvanians' Access to Community Pharmacist-Provided Medication Therapy Management and Immunization Services

Antinopoulos B, Bacci J, Smith R, Kumar S, Hoshitsuki K, Epple P, McGivney M

PURPOSE

The objectives of this study are to: (1) determine elderly Pennsylvania residents' geographic accessibility to community pharmacists, (2) examine the geographic distribution of community pharmacists in relation to Medically Underserved Areas, and (3) examine the geographic distribution of community pharmacists providing medication therapy management (MTM) and immunization services.

METHODS

Distribution of adults older than 65 years of age was obtained from 2010 Census data. Community pharmacist locations (CPLs) were obtained from the State Board of Pharmacy licensure database. CPLs providing MTM and immunizations were obtained from the OutcomesMTM® pharmacy locator and Healthmap Vaccine Finder, respectively. A measure of number of CPLs per 1,000 adults older than 65 years of age was generated to examine the spatial distribution of accessibility by census tract visually using ArcGIS. The spatial distribution of this ratio was visually examined within each census tract and within Medically Underserved Areas and Populations (MUA/P). Moran's I will be calculated to analyze spatial clustering of census tracts with a low ratio of CPLs per 1,000 elderly Pennsylvanians.

RESULTS

Preliminary results show that 53% of Pennsylvania census tracts contain at least 1 CPL that can be accessed by elderly Pennsylvanians. Thirty-four percent and 33% of census tracts contain a CPL that provide MTM and immunizations, respectively. Central and northern Pennsylvania have a lower distribution of CPLs compared to the eastern and western parts of the state upon visual examination. In the 7 counties that are entirely designated as MUA/P, there is at least 1 CPL.

CONCLUSION

With varying distribution, community pharmacists are accessible throughout Pennsylvania to provide MTM and immunizations services to elderly Pennsylvanians, including those in MUA/P.

Presented at the APhA 2015 Annual Meeting, San Diego, CA, 2015.



Brandon Antinopoulos, BS, PharmD

Brandon received his PharmD from the University of Pittsburgh School of Pharmacy in 2014. He earned a BS in accounting in 2007 from Penn State University. Upon completion of a community pharmacy residency, he will be working in partnership with the University of Pittsburgh School of Pharmacy and the Pennsylvania Pharmacists Association as the Executive Manager of the Pennsylvania Pharmacists Care Network, as well as Director of Clinical Services at Hometown Apothecary Drugs.

Mentor: Melissa McGivney, PharmD, FCCP, FAPhA

Deep-phenotyping for Hypoglycemic Events: An Automated Form of Detection for Community Acquired Drug-induced Hypoglycemic Events

Ather A, Saul MI, Kane-Gill SL

PURPOSE

Every year about 100,000 emergency hospitalizations are due to adverse drug events (ADEs) in adults 65 years or older. Deep phenotyping is the process of developing an algorithm that has high specificity and sensitivity to detecting adverse events. We sought to develop an algorithm to enhance detection of drug-induced hypoglycemic events resulting in emergency department (ED) visits and evaluating the outcomes of the hypoglycemic events to develop prevention strategies.

METHODS

Subjects aged ≥ 65 years who visited the EDs of three UPMC hospitals between January 1, 2014 and July 1, 2014. Hypoglycemia was defined as serum and/or point-of-care glucose level of ≤ 70 mg/dL upon arrival. De-identified reports were manually reviewed to determine physician reported drug-induced hypoglycemic events. The reports with hypoglycemic events were then separated into suspected positive or negative reports. These reports will be evaluated by domain experts to identify concepts that signify hypoglycemia and key concepts will then be used to form an algorithm. This algorithm will be validated on a set of new ED reports to evaluate the sensitivity and specificity of markers identified.

RESULTS

A total of 222 reports were reviewed, 40 (18.0%) reports had physician confirmed drug-induced hypoglycemia. Although hypoglycemic events were discussed in 145 (65.3%) reports, it was unclear if the event was drug-induced. Seventy out of the 145 (48.3%) reports mentioned that patients were taking anti-diabetic agents at home but association was not confirmed. Thirty seven (16.6%) reports indicated hypoglycemic event was not drug-induced. There were 30 (13.5%) falls, 20 (9.0%) seizures and 5 (2.2%) unconscious events attributed to hypoglycemia. The concepts for phenotyping application from these reports are currently being identified.

CONCLUSION

Developing a surveillance system for drug-induced hypoglycemic events can be advantageous in understanding the epidemiologic impact, improve prevention strategies and better management of patient health.

Presented at: 2014 ASHP Midyear Clinical Meeting, Anaheim, CA



Ayesha Ather, PharmD

Ayesha received her Pharm.D in 2014 from the University of Montana Skaggs School of Pharmacy and is currently completing her PGY-1 pharmacy residency at the UPMC Presbyterian Shadyside Hospital.

Mentor: Sandra L. Kane-Gill, PharmD, MS, FCCM, FCCP

Physicians' Perspectives on the Impact of Pharmacist Integration into Patient-centered Medical Homes: A Mixed Methods Analysis.

Breslin TM, Bacci J, Klatt T, McGivney MS, Durigan RC, Osborne M, DiFilippo A, Corbo J, Payette N, Cox-Vance L, Coley K, Thorpe C, Zaharoff J, Sakely H

PURPOSE

At UPMC St. Margaret, novel interprofessional practices have been developed in geriatric and family medicine settings in all levels of care. The primary objective of this study is to evaluate physicians' perceptions on the effect of the pharmacists' integration on the quantity and quality of their patient interactions and their participation in non-patient-care activities.

METHODS

Each of the 34 physicians who practice with a pharmacist were recruited via email to complete an electronic survey. The survey gathered baseline characteristics of physicians including time spent practicing with pharmacists and quantitative data describing the resulting effects on how they care for their patients. Quantitative data from the survey was analyzed using weighted averages (e.g. average people-hours per week [APH/wk]). Physicians were then invited to participate in key informant interviews to gather more in-depth description of the pharmacists' impact. Interviews were conducted until data saturation was achieved. The key informant interviews were transcribed and are undergoing qualitative thematic analysis.

RESULTS

Twenty-five physicians (74%) responded to the survey. The majority (n=7) had been in practice for 6-15 years, 59% had trained with a pharmacist, and 22% had never practiced without a pharmacist. Most physician-pharmacist collaboration occurred in outpatient family medicine offices (36 APH/wk), inpatient geriatric teams (22 APH/wk), and outpatient geriatrics office (12 APH/wk). Physician perception of utilization of time saved by practicing with pharmacists was highest in home/family life (67.5 APH/wk), patient care quality (56 APH/wk), and patient care quantity (54 APH/wk). Preliminary analysis of the key informant interviews revealed themes of the physicians being able to achieve more for patients with the same time commitment, and greater overall satisfaction with their life both at home and in practice.

CONCLUSIONS

Physicians perceive pharmacist collaboration as most impactful on their quality and quantity of patient care, quality of life, and comfort and satisfaction in practice.

Presented at the 48th Annual Society of Teachers of Family Medicine Conference, Orlando, Florida, April 2015, the American Geriatrics Society 2015 Annual Scientific Meeting, National Harbor, Maryland, May 2015, and the 21st Annual Teaching and Learning in Academic Medicine Conference May, 2015.



Teresa Breslin, PharmD, BCPS

Teresa received her PharmD from Wayne State University in 2013 and completed a PGY1 residency at UPMC St. Margaret 2014. Upon completion of her PGY2 geriatric residency and faculty development fellowship, she will start her new position as Transitions of Care faculty at Manchester University in Fort Wayne, Indiana.

Mentor: Heather Sakely, PharmD, BCPS

Effect of Simeprevir Administration on Dose-normalized Concentration of Calcineurin Inhibitors in solid Organ Transplant Recipients with Hepatitis C Infection

Brown MA, Johnson HJ, Dunn MA, Chopra KB

PURPOSE

Simeprevir (SMV) is second generation NS3/4A protease inhibitor that lacks the immunomodulatory effects of interferon, representing an attractive therapeutic alternative for the treatment of hepatitis C virus in solid organ transplant recipients. The effect of P-glycoprotein (P-gp) inhibition by SMV on serum concentrations of the calcineurin inhibitors (CNI) cyclosporine and tacrolimus is not well described in the literature. This evaluation was conducted to determine the magnitude of effect of P-gp inhibition with SMV on CNI blood levels.

METHODS

A retrospective cohort was evaluated to determine the interaction between SMV and the CNIs. Solid organ transplant recipients on maintenance immunosuppression with a CNI who initiated treatment with SMV between January 1, 2014 and April 30, 2015 were included in this analysis. The primary endpoint was to determine if treatment with SMV resulted in a significant change in CNI blood levels. Secondary endpoints included the number of patients who had a CNI dose modification and the average percent change in CNI blood level and serum creatinine from baseline while on SMV.

RESULTS

Twenty patients were identified for inclusion in this analysis. One patient could not be analyzed because they had not completed treatment with SMV at the time of evaluation. All nineteen evaluable patients had a significant change in their absolute CNI blood level following initiation of SMV, with an average percent change of -20.0% from baseline. Three patients (15.8%) had an increase in CNI dose and 4 patients (21.1%) had a decrease in CNI dose. Two patients (10.5%) had a significant increase in serum creatinine with an average percent change of 5.6% from baseline.

CONCLUSIONS

Patients on maintenance immunosuppression with a CNI who were treated with SMV did experience substantial alterations in their CNI blood levels. Further statistical analyses are in progress to determine the significance of this drug interaction.

Purpose and methods presented at the 49th ASHP Midyear Clinical Meeting and Exhibition, Orange County, CA, 2014.



Maxwell A. Brown, PharmD

Maxwell received his Pharm.D. from Northeastern University School of Pharmacy in 2014 and is currently a PGY-1 Pharmacy Resident at UPMC Presbyterian. He will complete his PGY-2 residency in Hematology/Oncology at UPMC Shadyside. After his PGY-2, he plans to practice in an academic medical center affiliated with a school of pharmacy to further his clinical and academic interests.

Mentor: Heather J. Johnson, PharmD, BCPS

Delayed Time to Active Therapy Predicts Microbiologic Failure Among Patients with Carbapenem-resistant *Pseudomonas aeruginosa* Bacteremia

Buehrle D, Potoski B, Shields R, Clarke L, Nguyen M-H

PURPOSE

Despite the emergence of carbapenem-resistant *Enterobacteriaceae* (CRE), *Pseudomonas aeruginosa* (Pa) remains the most common carbapenem-resistant pathogen encountered clinically. The purpose of this study was to determine clinical and microbiologic characteristics of carbapenem-resistant *Pseudomonas* (CRP) bacteremia.

METHODS

We conducted a retrospective cohort study of patients with CRP (defined as meropenem MIC $\geq 4\mu\text{g/mL}$) bacteremia from 2009–2014. Beta-lactamases (TEM-1, SHV-12, CTX-M, and KPC) were detected by PCR. Mutations or deficiency in porin gene *OprD* were identified by PCR and DNA sequencing.

RESULTS

Over the study period, 44 patients with CRP bacteremia were identified (8% of Pa bacteremia). 7 patients died within 48 hours were excluded. Of the remaining 37 patients, 68% were in the ICU and 59% required mechanical ventilation. The median Charlson Comorbidity Index, APACHE-II, and Pitt Bacteremia Score (PBS) were 5 (range 1–9), 19 (4–32), and 3 (0–12), respectively. Bacteremia was secondary to respiratory (27%), abdominal (24%), vascular catheters (24%), or

other sources (25%). 57% of patients had carbapenem exposure a median of 16 days (3–114) prior to CRP bacteremia. All strains demonstrated susceptibility to ≥ 1 anti-pseudomonal agent; 11% harbored ≥ 1 beta-lactamase gene and 68% showed alterations in *OprD*. Susceptibility rates for amikacin, cefepime, ciprofloxacin and piperacillin-tazobactam were 92%, 68%, 57%, and 57%, respectively. Accordingly, 92% of patients received active therapy; median time to active treatment was 23.5 hours (0–164). Microbiologic failure (persistent or recurrent bacteremia) occurred in 29%. Rates of death at 14, 30, and 90 days were 19%, 30%, and 43%, respectively. By multivariable logistic regression, delayed time to active therapy (≥ 48 hours) was a risk factor for microbiologic failure (OR=7.04, 95% CI 1.19–41.68, $P=0.03$) and PBS was independently associated with death at 14 days (OR=2.39, 95% CI 1.01–5.63, $P=0.046$).

CONCLUSION

As delay in effective therapy implicates microbiologic success, efforts should be focused on selecting active antibiotics *a priori*. Among CRP strains causing bacteremia, resistance is frequently mediated by changes to outer membrane porins, preserving susceptibility to other agents. Knowledge of prior carbapenem exposure may be useful in shortening time to active therapy.



Deanna Buehrle, PharmD

Deanna received her PharmD from Duquesne University in 2012 and is completing her PGY-2 infectious diseases pharmacy residency at UPMC Presbyterian. Upon completion of her PGY-2 pharmacy residency, she will join the outpatient infectious diseases department at UPMC as a clinical pharmacist.

Mentor: Brian Potoski, PharmD, BCPS (AQ-ID)

Impact of Pharmacy Service Line Implementation and Automation Optimization on Medication Safety and Efficiency.

Cadwalader JC, Kane-Gill S, L'Altrelli A

PURPOSE

The UPMC Presbyterian Pharmacy department has redeployed its pharmacist and pharmacy technician resources, and optimized its automation in order to improve medication safety and efficiencies. The purpose of this study was to assess the effect of the pharmacy model change on safety and efficiency of services.

METHODS

The model change included a redistribution of pharmacist and pharmacy technician duties by service line (i.e. transplant, medicine) with a focus on more equitable queue distribution of the number of orders verified by the pharmacist. Safety was measured by the number of reported missing doses and the number of stockouts in the automated dispensing machine (ADM). Technicians collected missing medication requests pre and post-model for comparison. Stockouts were evaluated by automated reports from the ADM. Efficiency was measured by percent of medications dispensed by both the ADMs and the RobotRx through automated reports. These safety and efficiency measures were compared for the pre and post model using a chi-square with Yates correction.

RESULTS

Average missing medications decreased from 45 to 7 after model implementation, an 85% decrease. ADM stockouts decreased from 39 to 20, a 49% decrease in the post-model. The percent of medications dispensed from the RobotRx increased from 37% to 50% ($p < 0.0001$) and percentage of medication dispensed from ADM decreased from 39% to 11% ($p < 0.0001$).

CONCLUSION

The automation optimization decreased the amount of medications dispensed from ADM, as well as their number of stockouts suggesting a safer delivery of medications for our patients. The optimization also significantly increased utilization of the RobotRx that was a goal of the model change and suggestive more better efficiency of resources. The creation of equitable queue distribution, minimization of missing dosing, and optimization of automation may result in a more efficiency and safe pharmacy practice.

Presented at the 2nd annual UPMC Pharmacy Resident Research Day. Pittsburgh, PA. 2015.



John Cadwalader, PharmD, MHA.

John received his PharmD from the Massachusetts College of Pharmacy and Health Sciences in 2012 and his Master's in Health Administration from the University of Pittsburgh in 2015. He has completed residencies in general pharmacy practice, pharmacy health-system management, and is currently completing his third year of residency in medication safety. Upon residency completion, John will begin working as a pharmacy supervisor at UPMC Presbyterian.

Mentors: Sandra Kane-Gill, PharmD, MS, FCCM, FCCP and Al L'Altrelli, PharmD

Pharmacist Identification, Resolution, and Prevention of Drug Therapy Problems in Older Adults Across the Health Care Continuum

Campbell AM, Coley K, Corbo J, Breslin TM, Klatt P, McGivney MS, Cox-Vance L, Thorpe C, Zaharoff J, Sakely H

PURPOSE

At UPMC St. Margaret, pharmacists are embedded in the geriatric healthcare team, and provide continuous comprehensive medication management in real time across all levels of care. The objective of this study, part of the **Pharmacists-led Interventions on Transitions of Seniors (PIVOTS)** group, is to quantify the impact of pharmacists on the care of older adults by describing 1) the most common drug therapy problems (DTPs) identified by pharmacists, 2) the medications most frequently involved in DTPs, and 3) the actions taken to resolve DTPs, while comparing and contrasting these findings across the care continuum.

METHODS

This prospective chart review analyzed data from over 1,000 patient-pharmacist encounters in a geriatric care practice from August 2014 to February 2015. For all patient care encounters in this six-month time frame, pharmacists used The Assurance System™ to document each DTP, medications involved, the patient's current care setting (e.g. outpatient clinic, personal care facility, skilled nursing facility), and actions taken to resolve the DTP. At the end of the six-month period, reports were run for analysis using descriptive statistics.

RESULTS

At the five-month interim analysis, 1,058 patient encounters were identified for 212 patients—50.9% of whom resided at home. Mean age was 80 years, 71.2% were female, and the mean number of DTPs identified by a pharmacist per encounter was 1.49. The most common DTP was dose too low, followed by dose too high and needs additional therapy. The medication most frequently associated with DTPs was warfarin, followed by enoxaparin and insulin. Pharmacists made 2,771 interventions on 189 different medications, with lab monitoring initiation and dose change as the most common interventions. Home-dwelling patients had a greater prevalence of compliance-related DTPs.

CONCLUSION

Final results will help build a foundation to then examine the effect of pharmacist patient care on outcomes and create a sustainable, replicable, and transferrable interprofessional practice.

Presented at the 48th Annual Society of Teachers of Family Medicine Conference, Orlando, Florida, April 2015 and the American Geriatrics Society 2015 Annual Scientific Meeting, National Harbor, Maryland, May 2015.



Ashley M. Campbell, PharmD

Ashley earned her PharmD at the University of North Carolina Eshelman School of Pharmacy in 2014. Upon completion of her PGY1, she'll continue at UPMC St. Margaret as a PGY2 in geriatric pharmacy and second year faculty development fellow. She ultimately hopes to couple her passions for teaching and clinical pharmacy in a faculty position.

Mentor: Heather Sakely, PharmD, BCPS

Patient-centered Pharmacist Interventions to Improve Adherence in an Advanced Heart Failure/Pulmonary Hypertension Clinic

Chan E, Hall D

PURPOSE

Medication non-adherence rates have been reported as up to 90% for patients with heart failure and/or pulmonary hypertension. Despite high rates of non-adherence, there is no standardized process at the UPMC Presbyterian Shadyside outpatient clinics to assess and address this issue. Pharmacists are well suited to work closely with patients and the multidisciplinary team to design patient-centered plans. The purpose of this project was to evaluate and describe the role of pharmacists in improving adherence for patients using targeted, patient-centered strategies.

METHODS

A prospective, cohort study design was used to compare adherence rates at one of the advanced heart failure/pulmonary hypertension clinics at UPMC Presbyterian Shadyside. Adherence was assessed using the 8-item ©Morisky Medication Adherence Scale (©MMAS-8) if patients were scheduled for an appointment with the cardiologist from January 1st, 2015 to March 31st, 2015. Inclusion criteria included patients ≥18 years old, adults capable of administering their own medications, and patients who identified as having low adherence. Exclusion criteria included patients with a life expectancy of less than 3 months. Additional questions were asked to conduct a comprehensive adherence

assessment for non-adherent patients. Adherence was assessed at 4 weeks up to 12 weeks after initial intervention. The types of adherence problem categories addressed were also recorded.

RESULTS

Adherence surveys were administered 53 patients. Three patients qualified as having low adherence. One patient was lost to follow-up, but had high adherence at 4 weeks after intervention. One patient had medium adherence by 12 weeks. The third patient had high adherence by 8 weeks. Overall, 18 interventions were documented. Adherence problem categories addressed included 5 interventions dedicated towards knowledge, 4 towards forgetfulness, and 3 towards financial access among other.

CONCLUSION

Adherence can be improved using targeted, patient-centered interventions. Further studies are needed to validate adherence tools that identify non-adherence and tailor interventions for patients with advanced heart failure/pulmonary hypertension.



Emily Chan, PharmD

Emily received her PharmD from the University at Buffalo. She completed her PGY1 Pharmacy Practice Residency with a focus in ambulatory care at Mercy Health Muskegon. Upon the completion of her PGY2 Ambulatory Care Pharmacy Residency at UPMC Presbyterian Shadyside, she hopes to obtain a faculty position with a focus in ambulatory care.

Mentor: Deanne Hall, PharmD, CDE, BCACP

Transitions of Care: Medication-Related Barriers Identified by Low Socioeconomic Patients of a Federally Qualified Community Health Center

Cope R, Quach K, Ahlborg J, Connor S, Jonkman L

PURPOSE

Patients of low socioeconomic status (SES) are known to be at particularly high risk for hospital readmissions due to complex and intertwined factors. The objective of this qualitative study was to identify and characterize barriers to optimal medication use for recently discharged patients of a federally qualified health center in an effort to improve the transitions of care process for practices serving primarily low SES populations.

METHODS

Semi-structured interviews were conducted with interested participants on topics related to medication access, management, and beliefs. Eligible participants were contacted within 30 days of discharge and included adult patients of UPMC Matilda Theiss who were discharged from a hospital between January-June 2015. Exclusion criteria included admissions lasting <24 hours, discharge to palliative care, non-English speaking, and inability to contact after three attempts. Interviews were audio-recorded and transcribed verbatim. A codebook was developed using the transcriptions. Two independent reviewers coded each interview and met to discuss discrepancies between coding. From the codes, the research team identified themes utilizing a modified grounded theory approach.

RESULTS

Six interviews have been completed to date. Preliminary themes include 1) participants identify multiple structural barriers to optimal medication use following discharge; 2) participants have unmet expectations for physician communication; 3) participants perceive many “anti-patient” attitudes from health care workers in the hospital; 4) participants identify adaptability and medication awareness as protective factors; 5) participants view healthcare as a team effort between professionals and patients.

CONCLUSION

Processes are needed order to improve care transitions with regards to communication and patient engagement. All members of the health care team can play an integral role in the transitions process by ensuring timely medication access, regularly addressing adherence, and effecting feelings of value and empowerment in patients.



Rebecca Cope, PharmD

Rebecca received her PharmD from Albany College of Pharmacy & Health Sciences in 2013 and completed her pharmacy practice residency at The Brooklyn Hospital Center in Brooklyn, NY in 2014. She will join the faculty at Touro College of Pharmacy in New York, NY as an assistant professor with a clinical practice site at The Brooklyn Hospital Center following completion of her residency in global health and underserved care.

Mentors: Sharon Connor, PharmD and Lauren Jonkman, PharmD, MPH, BCPS

Evaluation of Efficacy and Safety of Oxcarbazepine for the Management of Neonatal Seizures

Countway A, Polischuk E, Crowley K

PURPOSE

Oxcarbazepine is utilized at Children's Hospital of Pittsburgh of UPMC for neonatal seizure management. It is well tolerated and minimally sedating in other patient populations but has not been studied in neonates. The purpose of this study is evaluation of efficacy and safety of oxcarbazepine.

METHODS

All neonatal ICU patients receiving oxcarbazepine between January 2010 and October 2013 were included and followed for a maximum of 12 months. Exclusion criteria included established oxcarbazepine therapy prior to admission or if oxcarbazepine was discontinued due to withdrawal of care. Data collected included age, dose weight, renal/liver function, admission diagnosis, neurologic diagnosis, MRI and EEG reports, and antiepileptic medications received prior to oxcarbazepine initiation. Efficacy data included initial dose of oxcarbazepine and dose escalations, number of breakthrough seizures, and additional antiepileptic medications added. Safety data included serum sodium and oxcarbazepine levels, and inpatient/outpatient adverse drug events related to oxcarbazepine. This retrospective chart review was approved by the institutional review board at The University of Pittsburgh Medical Center. Data analyzed using descriptive statistics.

RESULTS

Thirty patients were identified. 70% of patients did not experience breakthrough seizures. Of those with breakthrough seizures, three had progression of disease and two received inadvertent subtherapeutic dosing. Mean initial dosing was 10mg/kg/day, titrated to a mean of 30mg/kg/day. 78% of oxcarbazepine levels were within therapeutic range. Seizures occurred in one patient with a subtherapeutic level. 20% had abnormal sodium levels; 5 patients had sodium levels less than 133mMol/L while one patient had a level exceeding normal. Oxcarbazepine was not discontinued on any patient due to clinically significant abnormal sodium levels. No other adverse effects reported in ADE database or outpatient notes.

CONCLUSIONS

Oxcarbazepine appears to be an effective and safe treatment option for neonatal seizures. If confirmed with further study, this finding may add a safe and tolerable option for these patients.

Presented at the 24th Annual Pediatric Pharmacy Advocacy Group National Meeting, Minneapolis, Minnesota. 2015.



Anne Countway, PharmD

Anne received her PharmD from Duquesne University in 2014 and is completing her PGY1 pharmacy residency at Children's Hospital of Pittsburgh of UPMC. Upon completion of her PGY1 pharmacy residency, she plans to continue on to a PGY-2 pediatric pharmacy residency at Monroe Carell Jr Children's Hospital of Vanderbilt.

Mentors: Emily Polischuk, PharmD; Kelli Crowley, PharmD, BCPS

Vancomycin Monitoring Practices and Resultant Safety Outcomes in a Tertiary Medical Center

Delic JJ, Andrzejewski C, Wilson LM, Yassin MH

PURPOSE

Vancomycin is a commonly prescribed antibiotic in the hospital setting. Although this agent remains an effective choice when used as both empiric and targeted therapy, it has been shown to cause acute kidney injury when not adjusted appropriately. The objective of this quality improvement project is to assess whether intravenous (IV) vancomycin is appropriately monitored within our institution and to determine the occurrence of specified safety outcomes when it is not utilized appropriately.

METHODS

A retrospective, cohort study design was used to compare patients receiving IV vancomycin at UPMC Mercy from November 2013 to February 2014. Patients of age 18 years or older who received IV vancomycin during the stated date range were identified via data extraction software and randomly selected for review. Patients who received vancomycin based on random levels due to poor renal function or those receiving hemodialysis were excluded. Patient demographics, labs, medication orders, and toxicology results were manually abstracted from the electronic hospital records within the health system. This data was analyzed using simple descriptive statistics such as mean or median for continuous data and percentages for categorical data. Chi-squared and t-tests were utilized

to determine a difference among variables; of particular interest, if a difference existed for patients receiving vancomycin therapy that was physician-managed versus pharmacy-managed. This project will identify areas for improvement in vancomycin management and provide a foundation for future projects to be completed.

RESULTS

Pending

CONCLUSIONS

Pending

This project has yet to be presented.



Justin J. Delic, PharmD

Justin received his PharmD from the Duquesne University Mylan School of Pharmacy in 2008 and is currently completing a pharmacy practice residency at UPMC Mercy. Upon completion of his current residency, Justin will be completing a post-graduate year 2 critical residency at University Hospitals Case Medical Center in Cleveland, Ohio.

Mentor: Christina Andrzejewski, PharmD, BCPS

Time and Motion Analysis of Two Clinical Pharmacists in Four Primary Care PCMH Offices: Successful Collaborative Relationships to Improve Patient Care (SCRIPT)

Durigan RC, Payette N, Breslin TM, McGivney MS, Sakely H, Bacci J, Coley K, D'Amico F, Difilippo A, Osborne M, Klatt P

PURPOSE

The objectives of this study are to identify two clinical pharmacists' specific collaborative duties completed within four local patient centered medical homes (PCMH) and correlate the pharmacists' responsibilities with a monetary value added to the practice.

METHODS

This time and motion observational study was conducted over eight weeks, including a two-week run-in period for process familiarization. Detailed observations of the pharmacists' daily patient care activities, along with time spent on the activities, were recorded during a series of two to four hour sessions at each of the PCMH sites until saturation was reached. Saturation was defined as the point when the researcher did not observe any new pharmacist activities. Observations were continued for two sessions beyond saturation. Each activity was then categorized into broad "pharmacist activities" and corresponding "activity components". Qualitative analysis and descriptive statistics will be used to complete the analysis and categorization. The results will then be used to correlate potential revenue and quality metrics with the pharmacists' activities.

RESULTS

A total of 14 observation sessions were conducted from February to May 2015. The observed pharmacists' activities included chronic disease education, comprehensive medication management, transitions of care, answering drug information and patient-specific questions, and conducting home visits. These activities were further stratified into activity components such as patient interviews, chart review, documentation, research, and communication with other healthcare professionals. Time spent on these activities and components will be analyzed for each of the PCMH sites.

CONCLUSIONS

The preliminary findings of this time and motion analysis identify the common key elements of pharmacist collaborative patient care activities. Further analysis will be conducted to show if this practice model can be reproducible, sustainable, and transferable.

Presented at the 48th Annual Society of Teachers of Family Medicine Conference, Orlando, Florida, April 2015, and the 21st Annual Teaching and Learning in Academic Medicine Conference, May 2015.



Raymond C. Durigan, PharmD

Chris received his PharmD from the University of Rhode Island in 2014. He is currently a PGY1 resident at UPMC St. Margaret and will be continuing on as a PGY2 Ambulatory Care resident next year. Upon completion of his PGY2 residency, Chris hopes to obtain a clinical pharmacist position within a PCMH with a joint faculty appointment.

Mentor: Patricia Klatt, PharmD, BCPS

Retrospective Evaluation of the Effects of Drug Utilization Management Strategies on High Risk Medications in an Elderly Population

Emerson EJ, Burnheimer SA, Daw JR

PURPOSE

Some medications are generally considered inappropriate for use in patients over the age of 65 due to their tendency to cause adverse events. To promote the appropriate use of high risk medications (HRMs) UPMC Health Plan implemented several drug utilization management (UM) strategies for the 2013 and 2014 benefit year to the Medicare Part D formularies. This evaluation aims to determine the effect of drug management strategies on the utilization of HRMs and pharmacy spend associated with select UM changes.

METHODS

The analysis was a retrospective claims review of Medicare Part D members >65 years of age. The study evaluated the change in HRM utilization in the overall Medicare population and in utilization of each impacted medication class affected by a UM strategy. In addition the study analyzed select medication use and median per member per month (PMPM) pharmacy cost, after the implementation of UM changes to both high risk skeletal muscle relaxants and nonbenzodiazapines hypnotics.

RESULTS

The study demonstrated a decrease in the overall percentage of members using HRMs between 2012 and 2014 (17.53% to 12.51%). There was also a significant decrease in member utilization of each medication affected by the 2013 and 2014 UM changes in the following years ($p < 0.001$). A majority of members did not continue on a skeletal muscle relaxant or an alternative pain-related medication. Similarly, 41% of members did not continue on any insomnia-related medication. There was a significant decrease in median PMPM pharmacy cost associated with pain-related ($p = 0.009$) and insomnia-related ($p < 0.001$) medication use in skeletal muscle relaxant and nonbenzodiazapine hypnotic utilizers, respectively.

CONCLUSION

The UM strategies implemented decreased HRM utilization in the Medicare population. The pharmacy cost associated with selected medications was also decreased.

Presented at the Academy of Managed Care Pharmacy 27th Annual Meeting, San Diego, California; April 2015



Eric Emerson, PharmD

Eric received his PharmD from the University of Pittsburgh, School of Pharmacy in 2014. After completion of his managed care residency at UPMC Health Plan he plans to continue to pursue a career in managed care.

Mentors: Sara Burnheimer, PharmD; Jessica Daw, PharmD, MBA; Kim Coley, PharmD, FCCP

Assessment of Medication Histories and Medication Literacy at UPMC McKeesport

Gahbauer A, D'Antonio N, Heintz J

PURPOSE

At UPMC McKeesport, it is not required for nurses to verify patient-reported medication histories with outpatient records when documenting home medications. The level of medication literacy in the McKeesport patient population has not been measured. This project aimed to demonstrate improved accuracy of medication histories with incorporation of outpatient records, and to provide a preliminary assessment of medication literacy among UPMC McKeesport patients.

METHODS

From February 4 to April 2, 2015, a pharmacist completed redundant medication histories for a convenience sample of new admissions to the family medicine service using outpatient records and patient interview. Discrepancies between these and the standard-method medication histories for each patient were documented and reported. A clinical reviewer determined each discrepancy's potential for causing short- and/or long-term harm. Patients' understanding of their medications' purpose and administration technique were assessed.

RESULTS

Medication histories were completed for 66 patients. Mean medications and discrepancies per patient were 8.3 ± 6.4 and 3.2 ± 3.5 , respectively. Discrepancies were "missing" medications (45.0%), "extra" medications (20.9%), and dose (17.1%), frequency (13.3%), and name/formulation (3.8%) errors. If uncorrected during hospitalization, 41.4 % of discrepancies had potential to cause an adverse event of "significant" (33.5%), "serious" (7.3%), or "life-threatening" (0.5%) severity. If propagated to outpatient medications, 60.3 % of discrepancies had potential to cause harm within one year. Interviewed patients (n=50) were asked the indication for 75.1% of their medications and knew the indication 85.5% of the time. Inhaler technique was "perfect" 57.1% of the time (n=21), but 28.6% made two or more errors. "Perfect" insulin injection technique was demonstrated by 2 of 6 patients.

CONCLUSION

Identified discrepancies suggest that medication histories could be improved by utilization of outpatient records. Patients do not know the indications for all of their medications and do not always use inhalers and insulin pens properly.



Alice Gahbauer, PharmD

Alice received her PharmD from the University of California, San Francisco in 2013. Upon completion of her pharmacy practice residency at UPMC McKeesport, she will join the University of Charleston in West Virginia as an assistant professor and ambulatory care clinician.

Mentors: Nicole D'Antonio, PharmD, BCPS; Jerad Heintz, PharmD, MBA

Impact of Community Pharmacist Coaching on Targeted Medication Review Completion Rates

Garmong GE, Bacci JL, Berenbrok LA, McGrath SH, Ossman KL, Odukoya OK, McGivney MS

PURPOSE

An adaptive coaching program was developed to support community pharmacists in providing patient care. Our quality improvement initiative evaluates the impact of this program on targeted medication review (TMR) completion rates and revenue from medication therapy management (MTM) platforms, while describing pharmacists' perceptions of the coaching program.

METHODS

Pharmacies within a traditional community pharmacy chain in the greater Pittsburgh area were stratified into low, intermediate, and high performance groups based on baseline TMR completion rates. Three pharmacies from each group were randomly selected and recruited as intervention (coaching) pharmacies. Coaching consisted of an initial interaction with each pharmacy's pharmacist champion, a 1 week follow-up call, and follow up visits at 1 and 2 months. Each intervention pharmacy was matched to a control pharmacy based on performance and pharmacy characteristics. TMR completion rates and revenue will be obtained from MTM platform reports for the 3-month period pre- and post- intervention. Changes in these metrics will be compared between intervention and control pharmacies. Semi-structured interviews were conducted to obtain participating pharmacists' perceptions of the coaching program. Interview audio recordings were transcribed verbatim and will undergo thematic analysis.

RESULTS

Eleven pharmacists and 1 student pharmacist from 9 pharmacies received coaching from February to April 2015. Pharmacists appeared receptive to coaching and believed MTM to be important. Pharmacists valued in-person feedback on their patient care process and suggestions for incorporating MTM into workflow. Well-trained ancillary staff and interns were cited as facilitators of patient care. Analysis of impact on TMR completion rates and revenue from MTM is ongoing.

CONCLUSIONS

On the job, individualized coaching has the potential to increase provision of patient care by community pharmacists. This coaching structure may be used as a template to support implementation of future patient care initiatives within pharmacy.

Presented at the APhA2015 Meeting, San Diego, Ca., 2015.



Gale Edward Garmong, PharmD

Gale received his PharmD from the LECOM School of Pharmacy in Erie in 2014 and is completing a community practice residency at the University of Pittsburgh and Rite Aid Pharmacy. Upon completion of residency, he plans to practice pharmacy with Rite Aid and remain active with precepting and teaching student pharmacists.

Mentor: Melissa Somma McGivney, PharmD, FCCP, FAPhA

The Effect of Simeprevir on Blood Pressure Control in Patients with Hepatitis C that are Using Concurrent Calcium Channel Blocker Therapy for Hypertension

Graham E, Chopra K, Dunn M, Johnson H

PURPOSE

Simeprevir (SMV), a protease inhibitor used for the treatment of hepatitis C virus (HCV), is an inhibitor of OATP1B1/3 and P-glycoprotein and it mildly inhibits intestinal CYP3A4. Calcium channel blocker antihypertensives (CCBs) are P-glycoprotein and intestinal CYP3A4 substrates that could be affected by the concomitant use of SMV. However no guidance has been published on their concurrent use. The intent of this assessment is to retrospectively examine the effect of SMV on blood pressure in UPMC Center for Liver Disease patients with hypertension simultaneously being treated with a CCB.

METHODS

A retrospective cohort evaluation was performed on any patients at the UPMC Center for Liver Diseases who had a diagnosis of HCV and were being simultaneously treated with SMV and a CCB for hypertension at any point from December 2014 to June 2015. The primary endpoint of this analysis was to determine if concurrent treatment with SMV and a CCB resulted in hypotension leading to adjustments in their antihypertensive regimen.

RESULTS

Twenty-three patients were included in this analysis. Of the included patients, 65.2% were male and 95.6% were Caucasian. Only one patient was forced to discontinue their CCB during treatment with SMV. Two patients discontinued other antihypertensive therapies due to hypotension during concurrent treatment with SMV and a CCB. The average mean arterial pressure (MAP) in patients prior to initiating SMV was 95. The average MAP in patients mid-treatment with SMV and after discontinuation was 93 and 92, respectively. Of note, CCB dose reductions were preemptively made in nine patients prior to initiating SMV therapy.

CONCLUSION

The majority of patients did not require adjustments to their antihypertensive regimens during concomitant treatment with a CCB and SMV. Additionally, the average MAP in patients remained relatively stable throughout their treatment course with SMV.

Presented at the 2014 ASHP Midyear Clinical Meeting, Anaheim, CA, 2014.



Emily Graham, PharmD, MS

Emily received her PharmD from the University of Pittsburgh School of Pharmacy in 2014. She completed her BS in Biology at Bucknell University in 2006 and her MS in Medical Sciences at Drexel University in 2008. After the completion of her PGY1 pharmacy residency at UPMC Presbyterian, Emily will be heading across town to Allegheny General Hospital for PGY2 training in hematology/oncology.

Mentor: Heather J. Johnson, PharmD, BCPS

Effect of Severity Stratification and Treatment Choice on Recurrence of *Clostridium difficile* Infection

Henderson SJ, Ours RL

PURPOSE

Clostridium difficile infection (CDI) accounts for 15-25% of antibiotic associated diarrhea in the acute care setting, leading to increases in morbidity and mortality. Despite appropriate treatment, recurrence of infection is an issue and has been reported in 6-26% of patients treated for an index occurrence of CDI. The purpose of this investigation is to assess treatment selection based on infection severity and the effect that it has on recurrence of CDI.

METHODS

This is a retrospective analysis of patients diagnosed and treated for CDI at UPMC Hamot as identified by a positive *Clostridium difficile* polymerase chain reaction test and symptomatic diarrhea. Infection severity, pharmacologic regimen and recurrence of infection were analyzed to determine the effect of treatment choice on recurrence of CDI. Antibiotic use, hospitalization, immunosuppression, use of gastrointestinal pH modifiers, surgery, age, number of comorbidities, patient gender, and strain of bacterium were also examined to evaluate their role in recurrence of CDI.

RESULTS

Of the 65 patients reviewed, 13 (20%) had a recurrence of CDI. One patient (8%) who developed recurrence was undertreated for disease severity. Ten patients (19%) without recurrence of CDI were undertreated with no difference observed between groups ($p=0.439$). Immunosuppression was the only secondary contributor influencing recurrence of infection ($p=0.042$). Suboptimal treatment for disease severity, including under treatment and overtreatment, was seen in 31 patients (47%).

CONCLUSION

No difference in recurrence rate was observed in those under treated according to CDI severity. Of the patients treated for CDI, approximately half were under or over treated based on disease severity. Although the results observed from these data do not reveal a definitive effect on recurrence, better severity stratification and treatment choice can ensure all patients are treated in concordance with evidence based guidelines.

Presented at UPMC Hamot Research Days 2015: Humanism in Medicine. Erie, PA. April 23, 2015.



Stephen Henderson, PharmD

Stephen received his PharmD from the Raabe College of Pharmacy at Ohio Northern University in 2014 and pursued a pharmacy practice residency at UPMC Hamot to be completed in June of 2015. Upon completion of residency, he will continue on at UPMC Hamot as a clinical specialist.

Mentor: Rachael L. Ours, PharmD

Patient Perceptions of Pharmacist-led InterVentions On Transitions of Seniors (PIVOTS) by Longitudinal Surveys

Higbea A, Klatt P, Thorpe C, Schleiden L, Coley K, Zaharoff J, Corbo J, Cox-Vance L, Balestrino V, McGivney M, Sakely H

PURPOSE

Older adults have complex medication regimens and experience many transitions in care that can contribute to drug therapy problems. A novel practice was developed where pharmacists provide direct patient care and make medication related decisions within an interprofessional team in four settings: skilled-nursing facility, personal care facility, outpatient offices, and a hospital. Pharmacists communicate drug-therapy problems with providers and patients. The primary objective is to evaluate the impact pharmacist have in the practice on independently living patients over time through surveys regarding their perceptions of drug therapy problems and coordination of care.

METHODS

An analysis will be undertaken using a newly developed survey tool focusing on patient's interactions with the pharmacist, and how the relationship affected the patient's medication use, self-efficacy, and perceptions. Older adult patients were surveyed at two outpatient geriatric practices at baseline and at 6 months.

RESULTS

Preliminary results of 32 patients that completed the study, show 75% feel having a pharmacist in their doctor's office is important. This percentage increased

from 53.8% to 87.5% of the group that did not interact with the pharmacist at baseline but interacted with the pharmacist by follow-up, respectively. Over 95% patients who interacted with a pharmacist felt having pharmacists in the doctors' office gave them more time to ask questions about medications. By December 2015 there will be more descriptive data and analysis to describe how perceptions over time can provide insight in quality of care provided, and identify improvement strategies.

CONCLUSION

Pharmacists interact with patients and the healthcare team in all care settings providing direct patient care in a novel geriatric care practice. Patient surveys focusing on the impact of the practice were implemented. The results are expected to provide feedback on how the pharmacist added to their understanding of their drug therapy problems and coordination of care.

Presented at 47th Annual Society of Teachers of Family Medicine Spring Conference, San Antonio, TX. 2014; American Geriatrics Society Annual Meeting, Orlando, FL. 2014; 20th Annual Teaching & Learning in Academic Medicine. Pittsburgh, PA. 2014; 1st Annual University of Pittsburgh School of Pharmacy Resident Research Day. Pittsburgh, PA. 2014; 48th Annual Society of Teachers of Family Medicine Spring Conference, Orlando, FL. 2015



Ashley Higbea, PharmD

Ashley received a BS in Chemistry from Virginia Commonwealth University (VCU) and her PharmD from VCU School of Pharmacy. She finished a PGY1 Pharmacy Residency, and she is currently completing a PGY2 in Ambulatory Care and Faculty Development Fellowship at UPMC St. Margaret. Her professional interests include helping patients manage their chronic disease states while working in interdisciplinary teams.

Mentor: Heather Sakely, PharmD, BCPS

Naloxone Counseling for Harm Reduction and Patient Engagement

Hill LG, Koenig ME, Das N, Han JK

PURPOSE

From 1999–2008, opioid prescribing and overdose deaths quadrupled. In 2009, drug overdose deaths surpassed motor vehicle crashes as the leading cause of injury death. In 2014, UPMC St. Margaret initiated a harm reduction strategy in three patient-centered medical homes. Goals included increased naloxone prescribing, decreased opioid use, enhanced provider satisfaction, and prevention of overdose deaths.

METHODS

A naloxone counseling intervention was implemented in February 2014. An outreach letter was designed with input from clinic providers (physicians, pharmacists, behaviorists), an order set was developed to facilitate naloxone prescribing, and intranasal naloxone kits were assembled for free dispensing. Patients were identified as high-risk if they admitted to past illicit opioid use or required opioids for chronic pain. Pharmacists or other trained providers demonstrated and discussed naloxone administration with patients and caregivers. Providers and staff received education about the naloxone counseling intervention from pharmacists before implementation and periodically thereafter. Physician residents were surveyed before and after the intervention to assess their attitudes. Patients who received naloxone kits were surveyed to assess their attitudes and use of opioids and naloxone.

RESULTS

From 2/1/14–3/12/15, 126 outreach letters were mailed or printed, and 67 naloxone kits were dispensed. Of the kits dispensed, 61% were prescribed for illicit use and 39% were prescribed for patients with chronic pain. Physician resident surveys indicated improved satisfaction caring for patients requesting opioids. Surveyed patients endorsed high levels of comfort discussing opioid use with providers, and several stated they had discontinued opioid use. Four successful overdose reversals were reported to clinic providers.

CONCLUSIONS

A naloxone counseling intervention implemented in three patient-centered medical homes increased naloxone prescribing, decreased opioid use, enhanced provider satisfaction, and prevented overdose deaths. The interprofessional nature of the project provided unique opportunities for care integration and patient engagement.

Presented at Family Medicine Education Consortium Northeast Regional Meeting, Arlington, VA, 2014; UPMC Graduate Medical Education Leadership Conference, Pittsburgh, PA, 2015; Society of Teachers of Family Medicine Annual Spring Conference, Orlando, FL, 2015, Teaching and Learning in Academic Medicine Conference, Pittsburgh, PA, 2015.



Lucas G. Hill, PharmD, BCPS

Lucas G. Hill, PharmD, BCPS, earned his Doctor of Pharmacy degree from the University of Missouri–Kansas City in 2013. He is completing his second year in the family medicine pharmacy residency at UPMC St. Margaret and faculty development fellowship at the University of Pittsburgh. Dr. Hill has accepted a position as clinical assistant professor at the University of Texas at Austin College of Pharmacy and clinical adjunct professor at the University of Texas at Austin Dell Medical School.

Mentor: Marianne E. Koenig, PharmD, BCPS

Impact of Brief Interventions on Patient Medication Adherence and Customer Loyalty in a Grocery Store Chain Pharmacy

Jordan CA, Bacci JL, McGivney MS, Berenbrok LA, Richardson RM, DeJames JR, Pringle JL

PURPOSE

Screening and Brief Intervention (SBI) has demonstrated improved medication adherence rates and significant reductions in annual health care spending in the low to medium volume traditional community pharmacy setting. This quality improvement study set in a high-volume, regional supermarket chain pharmacy, aims to determine the impact of brief interventions on patient medication adherence and customer loyalty.

METHODS

Pharmacists and student pharmacists trained in SBI principles are conducting screenings and providing interventions in one pharmacy location in the greater Pittsburgh area. Patients are screened for risk of medication nonadherence using a validated questionnaire. Pharmacists utilize motivational interviewing to perform brief interventions for patients who screen positive. Changes in the pharmacy's adherence related performance measures are being monitored via the Electronic Quality Improvement Platform for Plans & Pharmacies (EQuIPP). The primary adherence outcome is change in proportion of days covered (PDC), measured using pharmacy refill data. The primary customer loyalty outcomes are change in basket size (items purchased), sales, prescriptions filled, and store visits, measured using customer loyalty card data. Data is being collected before, during, and after the

intervention period and will be compared to a control population with similar baseline demographics.

RESULTS

An interim analysis of 2210 patients screened over a 2 month period, demonstrated changes in PDC for the following medication classes; beta-blockers (+5.33%), calcium channel blockers (-0.94%), renin angiotensin-aldosterone system inhibitor medications (+2.72%), oral diabetes medications (+7.44%), and statins (+3.02%). An 8.48% increase in PDC was seen for all medications (RR 1.11, $p < 0.0001$). Pharmacy performance data from EQuIPP demonstrated positive improvements. Loyalty outcomes included changes in store visits (+5.22%), sales (+2.81%), prescriptions filled (+15.87%), and basket size (-2.37%).

CONCLUSIONS

The SBI model has demonstrated significant improvements in patient medication adherence. Methods utilized in this study will be used to replicate and scale the SBI model across additional high volume pharmacies within the chain.

Presentations: 2015 American Pharmacists Association Annual Meeting, San Diego, CA; 2015 Pittsburgh Conference on the Science of Medication Adherence, Pittsburgh, PA



Christine Jordan, PharmD

Christine received her PharmD from the University of Pittsburgh School of Pharmacy in 2014 and will complete a community practice residency with Giant Eagle Pharmacy and the University of Pittsburgh in 2015. Upon completion of her community practice residency, Christine will join Giant Eagle as a Clinical Pharmacist.

Mentor: Janice Pringle, PhD

The Effect of the Pharmacy Practice Model Initiative on Patient Satisfaction at a Community Teaching Hospital

Joseph MP, Campbell RJ, D'Amico F

PURPOSE

The Pharmacy Practice Model Initiative (PPMI) aims to advance the pharmacy profession through direct patient care. Patient satisfaction survey responses are one determinant in Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. One domain of the patient satisfaction survey is “Communication about Medicine” which gauges the presence and effectiveness of education provided to patients related to the indication and potential side effects of new medications started in the hospital. This project aims to determine if hospital pharmacy workflow adjustments in June 2014, specifically built-in daily pharmacist-patient education interactions, have significantly impacted patient satisfaction survey responses relating to new medication education.

METHODS

This is a retrospective review of monthly patient satisfaction survey results relating to “Communication about Medication” education for the months of July 2014 – March 2015. For a six-month period before and after the workflow adjustment, the percentage of “Always” responses within the “Communication about Medicine” survey domain were analyzed and compared using a chi-square test. Secondary objectives of this study include pharmacist-patient interaction documentation and turnaround-time analysis since imposing the new work-flow

model. These results were analyzed with descriptive statistics.

RESULTS

In reference to patient education about new-drug indication, an average of 81.7 respondents answered “Always” post intervention compared to 78.8 during the months before the intervention ($p = 0.136$). For patient education about side effects, an average of 45.9 respondents answered “Always” after the intervention compared to 46.0 before the intervention ($p=0.887$). For the secondary objective of pharmacist documentation, a total of 52% of patients were counseled. The workflow intervention did not have an impact on turnaround time.

CONCLUSIONS

Despite a trend toward increased patient satisfaction scores, the work-flow intervention did not show statistical significance. A work-flow redesign will occur because of these results.

Presented at Society of Teachers of Family Medicine Annual Spring Conference – April 26, 2015 - April 29, 2015 – Orlando, FL

Will be presented at Teaching and Learning in Academic Medicine (TLAM) – May 21, 2015 – UPMC St. Margaret, Pittsburgh, PA



Matthew P. Joseph, BS, PharmD

Dr. Joseph received his BS in Biology from the University of Pittsburgh in 2010 and his PharmD from the University Of Pittsburgh School Of Pharmacy in 2014. Upon completion of his PGY1 Residency at UPMC St. Margaret, he will be starting a PGY2 in geriatric pharmacy at UPMC St. Margaret and hopes to eventually attain a position as a clinical specialist.

Mentor: Ronald Campbell, PharmD, BCPS

Evaluating Outcomes of a Neonatal Abstinence Syndrome Protocol in the Neonatal Intensive Care Unit

Kitts HL, Moffett SM

PURPOSE

Neonatal abstinence syndrome (NAS) is used to describe a combination of signs/symptoms of neonatal drug-withdrawal as a result of chronic intrauterine exposure to various licit and illicit substances. These substances may include opioids, barbiturates, benzodiazepines, selective serotonin reuptake inhibitors (SSRIs), nicotine, and alcohol. Set protocols for initiation and weaning of medications may prove beneficial in decreasing the neonate's length of stay in the hospital and the cumulative exposure to medications. The purpose of this study was to evaluate the effectiveness of a protocol for the management of NAS that was put into place in November 2013 at UPMC Hamot.

METHODS

The study was a retrospective chart review of two different groups of NAS patients treated at UPMC Hamot, one before protocol implementation and one after its implementation. Sixty four patients were included for data analysis (32 in the pre-protocol group and 32 in the post-protocol group). The primary outcomes evaluated were the cumulative morphine dose and the length of morphine therapy.

RESULTS

After comparison of the two groups, there was no statistically significant difference in the cumulative morphine dose (mg/kg) between the pre- and post-protocol groups. The average cumulative dose in each of the groups was $5.66 \text{ mg/kg} \pm 5.42$ in the pre-protocol group vs. $5.39 \text{ mg/kg} \pm 5.82$ in the post-protocol group ($p = 0.92$). The total duration of morphine therapy was also similar between the two groups with $16.4 \text{ days} \pm 11.5$ in the pre-protocol group vs. $17.3 \text{ days} \pm 12.8$ ($p = 0.24$). There was no statistically significant difference between the two groups in the number of babies who required phenobarbital therapy ($p = 0.22$). In the patients managed in the post-protocol group, adherence to the protocol was only about 78%.

CONCLUSION

Based on the results of this study, the implementation of the protocol did not appear to make a difference in the cumulative morphine dose or the length of morphine therapy in neonates treated for NAS at UPMC Hamot.



Holley L. Kitts, PharmD

Holley received her PharmD from Wingate University School of Pharmacy in 2014 and is now completing a pharmacy practice residency at UPMC Hamot. Upon completion of this residency, she plans to pursue practice in a hospital setting.

Mentor: Sarah Moffett, PharmD, BCPS

Stakeholder Perceptions of ICU Delirium Screening, Prevention, and the Involvement of the Patient Family

Korenoski AS, Kane-Gill SL, Grieves CJ, Alexander SA, Smithburger PL

PURPOSE

The purpose of this survey is to gain the perception of healthcare providers (nurses and physicians) that care for patients in the medical intensive care unit (MICU) in regards to delirium screening and non-pharmacologic prevention strategies, including barriers and future involvement of the patient family.

METHODS

A cross-sectional study of all MICU bedside nurses and physicians at UPMC was performed. A web-based survey was developed for Medical Intensive Care Unit (MICU) nurses and physicians to complete anonymously. Descriptive statistics were utilized to analyze survey responses.

RESULTS

For our preliminary results, thirty eight physicians [57% (38/67) response rate] and 34 nurses [33% (34/102) response rate] completed the survey. A total of 88% of nurses screen daily for delirium, whereas only 3% of physicians reported reviewing the delirium score recorded by the nurse. The most common delirium prevention techniques used were turning on or off the lights and re-orientation to place and time with 68% of physicians and 97% of nurses using this approach. The biggest barrier to conducting delirium prevention strategies was time for physician (50%) and severity of

disease for nurses (56%). However, the majority (68% of physicians and 58% of nurses) believe delirium prevention activities are important. All physicians and 90% of nurses believed family members should be included in delirium prevention activities and that including the family would improve delirium prevention (71% physicians; 59% nurses).

CONCLUSION

Delirium prevention is as an important aspect of care but barriers exist that limit the use of prevention strategies. Future work should focus on identifying ways family members may be utilized to maximize delirium prevention opportunities.



Amanda Korenoski, PharmD

Amanda earned her Doctorate of Pharmacy in 2012 and Master's in Health Administration in 2015, both at the University of Pittsburgh. She completed two previous post-graduate residency years at the University of Pittsburgh Medical Center (UPMC), focusing on pharmacy practice and health system pharmacy administration. She is currently completing at PGY-2 Critical Care Residency.

Mentors: Pamela L. Smithburger, PharmD, MS, BCPS and Sandra Kane-Gill, PharmD, MS, FCCM, FCCP

Impact of Intravenous Immunoglobulin on the Burden of Infection and Rejection in Lung Transplant Recipients with Hypogammaglobulinemia

Lichvar AB, Ensor CR, McDyer JF, Pilewski JM, Petrov AA

PURPOSE

Lung Transplant Recipients, (LTRs) with secondary hypogammaglobulinemia (HGG) have an increased incidence of infections, earlier development of Bronchiolitis Obliterans Syndrome (BOS), and higher mortality. The provision of exogenous immunoglobulin may ameliorate these negative effects. The purpose of this study was to evaluate the impact of intravenous immunoglobulin (IVIG) in LTRs with secondary HGG compared to a control group of LTRs without HGG.

METHODS

LTRs transplanted from 01/01/2007 and 12/31/2011 were retrospectively reviewed through 12/31/2014. IVIG replacement was described as either being intermittent or continuous. Time to the development of BOS and time to death were compared between the groups with the Kaplan-Meier method with log-rank comparison. Rejection burden was compared using the Composite Rejection Standardization Score (CRSS) calculated by cumulative of A-grade rejections divided by the number of transbronchial biopsies.

RESULTS

A total of 489 LTRs were enrolled and analyzed. Patients had a median age of 61.23 (IQR 51.1 – 67.9) years, were predominantly Caucasian (90%) with an antecedent disease of COPD (31.3%). HGG occurred in a majority of LTRs (69.3%) in the study. IVIG replacement occurred in 42.5% of LTRs via either continuous (4.7%) or intermittent (40.8%) replacement dosing. Median CRSS scores were not different at 1 year post-enrollment ($p=0.22$). Median CRSS scores were higher in LTRs receiving IVIG replacement both at 2-years ($p=0.040$) and 5-years post-enrollment ($p=0.010$) compared to controls. Time to BOS development through 5 years post-enrollment was similar between LTRs with no HGG compared to those with HGG receiving exogenous IVIG replacement ($p=0.426$). Time to death was significantly worse in LTRs with HGG receiving IVIG versus non-HGG controls ($p<0.001$).

CONCLUSION

Exogenous IVIG is a treatment option for LTRs with HGG, but outcomes remain unfavorable in this subset population. Future research is needed to identify the specific patient population that may benefit from this treatment modality.



Alicia Lichvar, PharmD

Alicia graduated from the University of Pittsburgh School of Pharmacy in 2013. She went onto complete a PGY1 Pharmacy Practice Residency at UPMC Presbyterian. After finishing her PGY2 Solid Organ Transplantation Residency, Alicia will join the University of Cincinnati as a Clinical Transplant Research Fellow and will obtain her Master of Science degree in Clinical and Translational Research. Ultimately, she hopes to obtain a clinical position at a large academic medical center where she can combine patient care, teaching, and research.

Mentor: Christopher R. Ensor, PharmD, BCPS

Evaluation of Kcentra® Use in a Tertiary Care, Academic Medical Center: a Quality Improvement Project

Lyons PJ, Ganchuk SR, Wilson LM, Simonelli RJ

PURPOSE

In the setting of life-threatening bleeds due to warfarin, the four factor prothrombin concentrate, Kcentra®, provides an effective alternative to fresh frozen plasma. Although Kcentra® lacks an indication for reversal of the new oral anticoagulants, one human trial suggest efficacy. However, Kcentra® carries a risk of thrombosis and should only be used for life-threatening bleeds. The purpose of this quality improvement project is to evaluate adherence to Kcentra® protocols for warfarin, rivaroxaban, and apixaban reversal in a tertiary care, academic medical center to determine if protocol adjustments are warranted.

METHODS

In this retrospective chart review, all patients who received Kcentra® at our institution from November 2011 through April 11, 2015 were included. Data were gathered to determine the appropriateness of Kcentra® use which was defined as prior use of an oral anticoagulant plus major bleed or need for emergent surgery. Data on mortality, adverse events, appropriate administration of vitamin K, accuracy of Kcentra® dose, length of stay, patient disposition, and time from order entry to patient administration were also analyzed.

RESULTS

In progress

CONCLUSIONS

Pending

Presented at ASHP 2014 Midyear Clinical Meeting, Anaheim, CA.



Pamela J. Lyons, BS, PharmD

Pam received a bachelor of science in the biological sciences from the University of Notre Dame in 2010 and her PharmD from the University of Pittsburgh in 2014. Pam is currently completing a pharmacy practice residency at UPMC Mercy and has accepted a pharmacist position at Mercy.

Mentors: Steve Ganchuk, PharmD; Robert Simonelli, PharmD

Comparison of Clinical Outcomes Between Two Meropenem Dosing Strategies in an Obese Population.

Marini RV, Andrzejewski C, Oleksiuk LM, Freedy H, Wilson LM

PURPOSE

Multiple studies have assessed the pharmacokinetic/pharmacodynamics (PKPD) and comparable efficacy of meropenem 500mg intravenously (IV) every six hours and meropenem 1000mg IV every eight hours. However, there is limited data comparing the PKPD and clinical efficacy of these dosing strategies in an obese population. The objective of this study is to compare clinical outcomes associated with these two dosing strategies.

METHODS

This retrospective study included obese patients who received at least 3 days of meropenem therapy at two large academic medical centers. An obese population was defined as a body mass index of at least 30kg/m². Regarding renal function, a minimum creatinine clearance of 30mL/min was required for inclusion. Primary outcomes included time to response and success rate at the end of meropenem therapy or at discharge. Success rate was defined as complete, partial, or failure based on the achievement of defervescence and resolution of infectious signs and symptoms. Secondary outcomes included in-hospital mortality and length of stay. Patients were matched based on age, gender, and type of infection. This study was approved by the University of Pittsburgh Institutional Review Board (IRB).

RESULT

Pending

CONCLUSIONS

Pending

Presented at ASHP Midyear Clinical Conference, Anaheim, CA. 2014



Rachel V. Marini, PharmD

Rachel received her PharmD from Duquesne University School of Pharmacy in 2014. Upon completion of a PGY-1 residency at UPMC Mercy, she plans to complete a PGY-2 residency specializing in Infectious Diseases at UPMC Presbyterian.

Mentor: Christina Andrzejewski, PharmD, BCPS

Patient Activation as a Measure of Medication List Accuracy

McCormick K, Bacci J, McGivney M, Smith Cooney S, Kunkel A, Smith R

PURPOSE

Patient activation levels have been tied to several healthcare outcomes including medication adherence and hospitalization. This study aims to 1) determine whether a relationship exists between patient activation and accuracy of medication lists among patients' practitioners in a rural community; 2) identify best practices for communication of medication list updates from pharmacist to prescriber.

METHODS

The study is occurring in a rural, community pharmacy setting among patients who have received a pharmacist-provided comprehensive medication review (CMR). Personal medication lists (PML) created during the CMR are serving as the "gold-standard" list (GS-PML) for comparison to practitioners' lists. Practitioners include the patients' pharmacists and prescribers. Medication list discrepancies are being classified as any incongruity between medication name, dose, frequency, route, omission, and duplication. Accuracy is being calculated using percent agreement with the GS-PML. The correlation coefficient between patient activation scores and accuracy will be converted into a Z-score using Fisher z-transformation for analyses. A brief survey is being administered to the prescribers and the results will be analyzed using descriptive statistics.

RESULTS

An interim analysis revealed a correlation coefficient of -0.218 (n=16). Medication lists have a mean percent agreement of 52.4% with 6.3 discrepancies per medication list. Omissions (55.4%) represent the largest cause of discrepancies. Patients are 50% female with a mean of 13.3 medications and a median PAM score of 3.5. The mean age is 65.4 years. Physician surveys are still being administered.

DISCUSSION

Discrepancies do exist between medication lists, even in highly activated patients. Yet, interim analysis demonstrates a trend toward no relationship between PAM scores and percent agreement of medication lists. Determining how to maintain accurate medication lists among practitioners is critical to medication safety and further research is needed to determine factors that lead to inaccurate medication lists.

Presented at the APhA2015 Annual Meeting and Exposition Contributed Posters Session, San Diego, Ca., 2015.



Kyle McCormick, PharmD

Kyle received his PharmD from the University of Pittsburgh School of Pharmacy in 2014 and is completing his community practice residency at Gatti Pharmacy in Indiana, Pa. Upon completion of his residency, he plans to continue his work in the health information technology (HIT) and digital health industry.

Mentors: Randall Smith, PhD; Melissa McGivney, PharmD, FCCP, FAPhA; and Stephanie Smith Cooney, PharmD

Effect of Aerosolized Antimicrobials on *Pseudomonas* Recurrence and Bronchiolitis Obliterans Syndrome after Lung Transplantation

Moore CA, Pilewski JM, McDyer JF, Gries CJ, Ensor CR

PURPOSE

Lung transplant patients are at an increased risk of bacterial pneumonia in comparison to other solid organ transplant recipients. Bacterial pneumonia has also been shown to be a potential risk factor in the development of acute cellular rejection (ACR) and bronchiolitis obliterans syndrome (BOS). Moreover, loss of lung allograft function is primarily due to BOS, with only 55% of patients surviving five years post-transplantation. Aerosolized antimicrobials in cystic fibrosis have demonstrated positive outcomes on pulmonary function and infection burden, but studies after lung transplantation are limited. The aims of this study were to assess the effects of aerosolized antimicrobials on infection burden, ACR, and BOS progression after lung transplantation.

METHODS

This was a retrospective single-center cohort study of patients who underwent lung transplantation from January 1, 2009 to December 31, 2014 and were colonized with *Pseudomonas spp.* Patients were divided into two cohorts based on whether or not they received aerosolized antimicrobials for 28 days or greater. The primary outcome was days to positive *Pseudomonas* reinfection as defined by a positive bronchoalveolar lavage (BAL) or sputum culture. Secondary outcomes included ACR burden as defined by composite rejection

standardized score, time to BOS progression, and all-cause mortality.

PRELIMINARY RESULTS

Of the 305 patients who met inclusion criteria, 106 (34.7%) received aerosolized antimicrobials for 28 days or greater. Tobramycin was the most commonly used aerosolized antimicrobial at 45.3% (48/106). Time to *Pseudomonas* culture positivity was not statistically different between the aerosolized antimicrobial and control cohort, with a median of 371 (IQR 138 – 828) days versus 365 (IQR 140 – 685) days, respectively ($p=0.342$). There was also no statistical difference in all-cause mortality between cohorts (OR=0.89, 95% CI; 0.54 – 1.5). Analysis of aerosolized antimicrobials on ACR and BOS are pending.

CONCLUSION

Preliminary results suggest that aerosolized antimicrobials did not affect time to *Pseudomonas* recurrence after lung transplantation.



Cody Moore, PharmD

Cody received his PharmD from the University of Pittsburgh School of Pharmacy in 2014. After completion a PGY-1 pharmacy residency at UPMC Presbyterian, he plans to complete a postdoctoral research training fellowship in solid-organ transplantation at the University of Pittsburgh School of Pharmacy.

Mentor: Christopher R. Ensor, PharmD, BCPS-CV

Evaluation of the Impact of Introducing Simulation-based Learning in Pharmacy in Singapore

Ong CL, Kane-Gill S, Kobulinsky LR, Seybert AL

PURPOSE

High fidelity human patient simulation (HPS) has been incorporated in various PharmD programs in the United States with favorable learning experiences, better knowledge retention and problem solving skills reported. In Singapore, high fidelity HPS is a novel learning technique for pharmacy education as it has not been utilized in the Bachelor of Science (Pharmacy) curriculum or for continuing professional education (CPE). Therefore, it is necessary to evaluate the acceptance of using high fidelity HPS in pharmacist education, beginning in the context of CPE. The purpose of this study was by pharmacist using HPS in CPE and to compare the participants' acceptance with HPS compared to online education.

METHODS

There were nineteen participants (pharmacists, and pre-registration pharmacists) recruited from the National Heart Centre Singapore and Singapore General Hospital. This was an experimental study design with informed consent obtained prior to randomizing participants into groups A and B. Group A completed an online independent self-learning (ISL) followed by a simulation based activity (SBA) with HPS, whereas group B completed them in reverse order to minimize sequential influence. Acceptance of teaching modalities was evaluated with a survey instrument. The educational

content for HPS and the online session was congestive heart failure. The educational content of both teaching modalities was evaluated by three external reviewers for equivalency.

RESULTS:

Sixteen (84.2%) participants were female and 11 (57.9%) aged 21 to 30 years old. All participants (100%) enjoyed the SBA compared to 13 (68.4%) for ISL. Sixteen (84.2%) and 17 (89.5%) agreed that SBA and ISL should be part of a CPE session respectively. Identical number of participants (18; 94.7%) felt SBA and ISL advanced their knowledge in pharmacotherapy management in heart failure. The number of participants who felt that SBA and ISL improved their critical and decision making skills was 18 (94.7%) and 15 (78.9%) respectively.

CONCLUSION:

Simulation-based learning was well received by participants in Singapore and can be implemented in CPE.



Chai Ling Ong, PharmD

Chai Ling, Ong completed her Bachelor of Science (Pharm) (Hons) at the National University of Singapore, and her pre-registration training at Changi General Hospital in Singapore. She worked at the Drug and Poison Information Centre before becoming an ambulatory pharmacist at National Heart Centre Singapore. She is currently completing her training in clinical pharmacy in cardiology at the UPMC and University of Pittsburgh School of Pharmacy.

Mentors: Sandra Kane-Gill, PharmD, MSc, FCCP, FCCM and Amy L. Seybert, PharmD, FASHP, FCCP, CHSE.

Impact of Clinical Pharmacists on Glycemic Control in a Patient Centered Medical Home: A Pre-post analysis of the Successful Collaborative Relationships to Improve Patient care (SCRIPT) study

Patel MM, Klatt P, Bacci J, McGivney M, Osborne M, Difilippo A, D'Amico F, Coley K, Thorpe C, Castelli G

BACKGROUND

Diabetes is one of the most common chronic diseases for which the management becomes more complex as the disease progresses. In 2009, the Successful Collaborative Relationships to Improve Patient care (SCRIPT) project was established which incorporated two clinical pharmacists into four PCMHs to provide patient care and practice management services. The aim was to explore the impact of clinical pharmacists on patient outcomes in this setting. Previous analysis of the SCRIPT project revealed that the majority of drug therapy problems (DTPs) identified between 2010-2014 were related to diabetes medications. This study aims to understand the impact of clinical pharmacists on glycosylated hemoglobin (HbA1c) in patients with diabetes.

METHODS

Retrospective pre-post analysis of 936 patients. Patients ≥ 18 years of age who had at least one documented HbA1c six months both before and after the first clinical pharmacist intervention were included. Data including age, zip code, sex, HbA1c, date of first intervention, number of interventions in six months were collected. Specific aims were to evaluate the change in HbA1c six months pre and post first intervention and understand the difference among covariates by subgroup analysis. Pre-intervention HbA1c value closest to the first

intervention was compared to the average of post-intervention HbA1c values. Statistical methods used for analysis were basic descriptive statistics as well as paired t-test.

RESULTS

Of the 137 patients analyzed primarily, 74 patients met inclusion. Paired t-test revealed average HbA1c pre and post intervention of 7.85% and 7.51% respectively with a net difference of 0.34% [0.01-0.69] $p=0.023$. Subgroup analysis is pending.

CONCLUSION

Preliminary findings of this pre-post analysis indicate that clinical pharmacists have a positive impact on HbA1c after just one intervention. This analysis demonstrates the benefits of incorporating pharmacists into PCMHs and the impact of their medication expertise in managing chronic diseases such as diabetes. Subgroup analysis will indicate which patients benefit the most from pharmacists' interventions.

Presented at: Society of Teachers of Family Medicine (STFM) National Conference, Orlando, FL, 2015; Teaching and Learning in Academic Medicine (TLAM) UPMC St. Margaret Hospital, Pittsburgh, PA, 2015



Miral M. Patel, BS, PharmD

Miral Patel obtained her Bachelors of Science from Stockton University before pursuing a PharmD from the Albany College of Pharmacy and Health Sciences-Vermont Campus, graduating in 2014. She is currently completing her pharmacy practice residency at UPMC St. Margaret Hospital. After graduation from her residency, Dr. Patel plans to practice in a hospital setting as a clinical pharmacist with teaching and precepting responsibilities.

Mentor: Patricia Klatt, PharmD, BCPS

Time-and-motion Analysis of the Geriatric Clinical Pharmacist: Pharmacists-led Interventions on Transitions of Seniors (PIVOTS)

Payette N, Breslin T, Durigan RC, Bacci J, Klatt T, McGivney MS, Corbo J, Cox-Vance L, Coley K, Thorpe C, Zaharoff J, Sakely H

PURPOSE

Through PIVOTS, two geriatric clinical pharmacists (GCP1 and GCP2) and a post-graduate year 2 geriatric pharmacy resident (PGY2) provide direct patient care for patients within four different levels of care: skilled nursing facility, two outpatient geriatric practices, and an inpatient geriatric teaching service. The objectives of this study are to identify the specific work of the pharmacists within the patient care team through a time-and-motion analysis and calculate the monetary value the pharmacists add to the practice.

METHODS

This time-and-motion observational study was performed over six weeks with a two-week run-in phase and four-week sampling frame throughout four geriatric practice sites. Observations of the clinicians included activities related to patient care or pharmacist responsibilities. Excluded observations were non-patient-care activities or conversation, administrative activities, and transit time. Saturation was reached at which point observations were discontinued. Analysis included thematic analysis as well as descriptive statistics.

RESULTS

A total of 3060 total minutes of observations were recorded with 157 minutes excluded. Analysis of pharmacists' activities revealed themes or "pharmacists' activities" including comprehensive medication management, teaching/education, and transitions of care. Themes were sub-divided into "activity components" which included: comprehensive medication review, communication with healthcare providers, face to face patient encounters, documentation, collaborative decision making, patient-specific questions from providers, drug information questions, and research.

CONCLUSIONS

This time-and-motion analysis of the PIVOTS practice highlights common key elements of these pharmacists to show that this practice is reproducible and transferable while further analysis is needed to show sustainability.

Presented at the 48th Annual Society of Teachers of Family Medicine Conference, Orlando, Florida, April 2015, the American Geriatrics Society 2015 Annual Scientific Meeting, National Harbor, Maryland, May 2015, and Teaching in Academic Medicine Conference 2015, Aspinwall, Pennsylvania, May 2015.



Nicole Payette, PharmD

Dr. Payette received her PharmD from the Philadelphia College of Pharmacy in 2014. She will be starting her PGY2 in Family Medicine/Ambulatory Care at UPMC St. Margaret in June. Upon graduation from residency Nicole hopes to obtain a faculty position to pursue her love of teaching and working with pharmacy students.

Mentor: Heather Sakely, PharmD, BCPS

Scholarly Contributions by Pharmacist Educators in Family Medicine: A Five-Year Review

Rindfuss SL, Broders-Jarrett J, Lounsbery J

PURPOSE

Pharmacists' roles in family medicine training programs are well established. Little data is known regarding their scholarly contributions within these roles. This project evaluated the prevalence of scholarly contributions by pharmacists in family medicine through North American literature and conferences and the impact on physician resident assessment via The Accreditation Council for Graduate Medical Education (ACGME) family medicine core competencies.

METHODS

A retrospective review of scholarly contributions by pharmacist educators within family medicine was evaluated via publications in eight of the highest impact family medicine journals and presentations at four major family medicine conferences from January 1, 2010 – December 31, 2014. Data collected included geographic location, affiliation, credentials, type of collaboration, and topic of each submission.

RESULTS

There were 418 unique pharmacists who produced 676 unique scholarly works during the study period. Each pharmacist averaged 1.6 scholarly works with an average of 1.4 pharmacists per work. Publications have gradually increased from 2.5 to 4.4%, while presentations have remained more stagnant, fluctuating between 3.0 and 4.0% over the study period. The most common ACGME core competencies supported were medical knowledge (37.6%), patient care (27.2%) and systems-based practice (24.3%).

CONCLUSIONS

Pharmacist involvement in scholarly works has increased overall, yet is a small subset of the scholarly works in family medicine. This work was limited by differences in reporting by publications and conference programs. Uniquely, this data identifies pharmacists as educators of systems-based practice as well as medical knowledge and patient care. Pharmacists have an active and growing role in family medicine scholarship with a broader focus than pharmacotherapy knowledge.

Presented at: 48th Annual Society of Teachers of Family Medicine Spring Conference, Orlando, Florida in April 2015; 14th Annual Graduate Medical Education Conference, Pittsburgh, Pennsylvania in February 2015



Sarah L. Rindfuss, PharmD, BCPS

Sarah received her PharmD from the University of Pittsburgh School of Pharmacy in 2013 and obtained BCPS certification in 2014. She completed a pharmacy practice residency at UPMC St. Margaret, and is currently completing a PGY-2 in family medicine through UPMC St. Margaret, based out of the Lawrenceville Family Health Center. Sarah is actively pursuing a position with a balance of teaching and clinical responsibilities.

Mentors: Jennie Broders Jarrett, PharmD, BCPS and Jody Lounsbery, PharmD, BCPS

The Effectiveness of Intravenous Vitamin K in Cirrhotic Patients

Rivosecchi RM, Johnson HJ, Kane-Gill SL

PURPOSE

Cirrhosis ranks in the top 15 causes of death worldwide with a 1-year mortality that approaches 57%. A commonly seen complication is the development of coagulopathy. Intravenous (IV) vitamin K supplementation is often used to correct the coagulopathy, despite a lack of quality evidence. The purpose of this study was to evaluate the effectiveness of vitamin K in this patient population.

METHODS

This was a retrospective review of cohort of cirrhotic patients receiving at least single dose of IV vitamin K between September 2013 and July 2014. Patients were excluded if baseline international normalized ratio (INR) ≤ 1.5 , had a repeat INR in < 6 hours, or received anticoagulation other than subcutaneous heparin. The primary outcome was the effectiveness of IV vitamin K as determined by a 30% decrease in INR or a decrease in INR to an absolute value of < 1.6 .

RESULTS

A total of 96 patients were initially included in the cohort of cirrhotic patients. The majority of patients, 52, were in the intensive care unit at the time of vitamin K administration. The median INR at the time of reversal was 3.0 ± 1.1 . Overall, 29.2% (28 patients) were deemed to have an effective decrease in INR. Sixty patients (62.5%) failed to achieve at least a 10% decrease in INR. The average baseline INR in patients achieving at least a 30% decrease was 3.9 ± 1.2 . A logistic regression analysis was completed with the following variables: baseline INR, use of fresh frozen plasma, model for end-stage liver disease (MELD) score, and vitamin K dose. Patients with a higher baseline INR were twice as likely to have an effective response to vitamin K (OR: 2.0; 95% CI 1.1-3.8).

CONCLUSION

The results of this analysis demonstrate that the use of IV vitamin K to correct coagulopathy of liver disease may not be beneficial. Patients with higher degrees of coagulopathy are more likely to have an effective response. Further studies need to be conducted in this patient population, including comparing the use of vitamin K to a cohort of patients not receiving therapy.



Ryan Rivosecchi, PharmD

Ryan received his PharmD from the University of Pittsburgh School of Pharmacy in 2013 and completed both a pharmacy practice and critical care residency at UPMC Presbyterian. Upon completion of his critical care residency, he plans to pursue a clinical specialist position in an academic medical center.

Mentors: Heather Johnson PharmD, BCPS
and Sandra Kane-Gill, PharmD, MSc, FCCP, FCCM

Evaluation of Timing and Selection of Initial Antimicrobial Therapy in the Management of Sepsis at a Large Urban Academic Hospital

Roberts KL, Wilson LM, Freedy H

PURPOSE

The Surviving Sepsis Campaign guidelines illustrate significance of early goal-directed therapy in severe sepsis and septic shock. A major component of this strategy is treatment of suspected or confirmed infection. The timing of initial antimicrobial therapy has been previously shown as the largest predictor of mortality in septic shock. Additionally, the appropriate selection of antimicrobial agents must be considered. Adequate empiric therapies and antimicrobial de-escalation are important for treatment of serious infections. The purpose of this investigation is to assess translation of these guideline recommendations into clinical practice at a 488-bed academic medical center.

METHODS

Subjects were identified via International Classification of Disease, Ninth Revision (ICD-9) codes for sepsis, severe sepsis, and septic shock between January 2013 and September 2014. A retrospective, cohort study design was used to determine the timing and appropriate selection of initial antimicrobial therapy for the treatment of sepsis in eligible patients. Documentation of suspected or confirmed infection along with the presence of two or more criteria of systemic inflammatory response syndrome, defined as temperature greater than 38 degrees Celsius or less than 36 degrees Celsius, heart rate greater than 90 beats per minute, respiratory rate

greater than 20 breaths per minute, and white blood cell count greater than 12,000 cells per millimeter cubed or less than 4,000 cells per millimeter cubed, were utilized to identify the time of sepsis diagnosis. The interval of time from sepsis diagnosis to administration of initial antimicrobial therapy is defined as the primary study outcome. Secondary outcomes include the interval of time from blood culture to first antimicrobial administration, the appropriateness of empiric antimicrobial selection, time to antimicrobial de-escalation, and in-hospital mortality.

RESULTS

Evaluations pending

CONCLUSIONS

Evaluations pending

Presented at the American Society of Health System Pharmacists Midyear Clinical Meeting, California, Anaheim. December 10, 2014.



Katherine L. Roberts, PharmD

Katie received her PharmD from Duquesne University in 2014 and is a current PGY1 pharmacy practice resident at UPMC Mercy in Pittsburgh, Pennsylvania. Following this, Katie will specialize in the area of critical care pharmacy through completion of a PGY2 residency at Barnes Jewish Hospital in St. Louis, Missouri.

Mentors: Laura Wilson, PharmD, BCPS and Henry Freedy, PharmD

Evaluation of Methylene Blue (MB) for Treatment (TX) and/or Secondary Prophylaxis (PX) of Ifosfamide-Induced Encephalopathy (IIE)

Shah AB, Brenner TL, Natale JJ, Burgess M, Tawbi H

PURPOSE

MB is used for the TX and/or PPX of IIE in sarcoma patients at our institution despite the paucity of data. This retrospective study was performed to assess the safety and effectiveness of MB in these patients. The primary and secondary objectives were to assess the incidence of severe toxicities in those receiving ifosfamide + MB TX/PPX and to determine the IIE recurrence rates, respectively.

METHODS

This is a descriptive, retrospective study in adult sarcoma patients receiving ifosfamide at UPMC Presbyterian/Shadyside hospital between June 2007 – October 2014. Ifosfamide treatment, toxicities, IIE events, and MB use were collected by chart review. Incidence of \geq grade 3 toxicities and IIE recurrences were identified. Known IIE risk factors and CYP-450 drug-drug interactions were collected for future analysis.

RESULTS

Sixty-seven patients were included in the interim analysis, of which, 22 patients experienced IIE. Eighteen (82%) of these patients experienced IIE during the first two cycles. Twenty patients received ifosfamide + MB for TX and/or PPX of IIE as follows: 7 received TX only, 6 received PPX only and 7 received TX and PPX. Anemia (70%), hypoalbuminemia (30%) and febrile neutropenia (25%) were the most common grade 3/4 adverse events. The most common reason for ifosfamide discontinuation was IIE (30%) and renal dysfunction (15%). IIE recurred in 2 (15%) out of 13 patients despite MB PPX. Both recurrences were seen in patients not receiving ifosfamide dose-reduction after initial IIE event.

CONCLUSION

The incidence of anemia and hypoalbuminemia were more common in the study group receiving ifosfamide + MB than the incidence cited in currently published literature. Since IIE recurrence was seen despite MB PPX, we will look at alternatives for IIE management.

Presented at the 11th Annual HOPA Conference. Austin, TX. 2015.



Anand B. Shah

Anand received his PharmD from University at Buffalo in 2011 and then completed his PGY 1 residency at Allegheny General Hospital in 2012. Thereafter, he completed two years of staffing at Memorial-Sloan Kettering Cancer Center in New York, N.Y. His professional interests include hematologic malignancies and bone marrow transplantation. Anand hopes to continue to positively impact patient care and have an active role in research and leadership.

Mentors: Timothy Brenner, PharmD, BCOP and James J. Natale, PharmD, BCOP

Impact of Policy Implementation and Pharmacist Intervention on the Overuse of Proton Pump Inhibitors and Histamine 2 Receptor Antagonists in the Hospital and at Discharge

Shick AS, Saber S

PURPOSE

Stress ulcer prophylaxis is often overused in the inpatient hospital setting and may lead to unnecessary costs and the risk of various adverse effects. In 2014, UPMC produced a guideline and policy for appropriate use of acid suppressing medications for the use of stress ulcer prophylaxis. The purpose of this investigation is to determine the impact of policy implementation and pharmacist intervention on the overuse of proton pump inhibitors and histamine 2 receptor antagonists in the hospital and at discharge.

METHODS

A retrospective analysis of the electronic medical record of 240 patients on pre-specified inpatient units of UPMC Hamot was conducted. Patients were included if they 18 years of age or older and were prescribed a PPI or an H2 antagonist for at least 48 hours. The PPI or H2-antagonist drug name, dose, route, frequency, indication, whether or not the therapy was appropriate, and whether or not time was spent in the ICU during admission before and after policy implementation were analyzed to determine adherence to guideline recommendations. Additionally, pharmacist interventions during the policy implementation period were documented and analyzed to determine pharmacist impact on policy/guideline implementation.

RESULTS

Prior to the UPMC Stress Ulcer Prophylaxis policy implementation and pharmacist intervention, the use of proton pump inhibitors and H2-antagonists on nursing units 3, 4, 6, and 7 was only appropriate 55.8% of the time for inpatients and 85% of the time at discharge. Following policy implementation and pharmacist intervention, there was a statistically significant increase in appropriate use for inpatients and at discharge, with use appropriate 83.33% ($P < 0.001$) and 93.33% ($P < 0.001$) of the time respectively. Between December 1, 2014 and February 28, 2015, there were 97 documented pharmacist interventions to discontinue inappropriate stress ulcer prophylaxis.

CONCLUSION

The recently implemented stress ulcer prophylaxis policy at UPMC Hamot has contributed to the improvement in appropriate use of proton pump inhibitor and H2-antagonist use in the hospital and at discharge. It can be extrapolated that a decrease in inappropriate use of these medications would thus reduce unnecessary costs and adverse effects. Pharmacists played a key role in the implementation of this policy and will continue to be an integral part of determining the appropriateness of medications used for stress ulcer prophylaxis.

Presented at: UPMC Hamot Resident Research Days, 2015



Angela R. Shick, PharmD

Angela received her PharmD from Lake Erie College of Osteopathic Medicine School of Pharmacy in 2014 and will be completing a PGY1 pharmacy practice residency at UPMC Hamot in 2015. Upon completion of residency, she plans to pursue a clinical pharmacist position in a hospital setting.

Mentor: : Steve Saber, PharmD

Chronic Hepatitis C Care: The New Frontier for Family Medicine Physicians

Tang VW, Ballard SL, Prasad RK

PURPOSE

In the era of interferon-based treatments, only 15% of family medicine (FM) physicians reported interest with initiating treatment for chronic hepatitis C virus (HCV). Given the emergence of direct-acting antivirals, which yield high efficacy and minimal toxicity, this study aimed to describe the current attitudes, views, and concerns among FM physicians regarding HCV treatment in the primary care setting.

METHODS

A qualitative study with face-to-face, semi-structured interviews of FM physicians was conducted in March 2015. Physicians were interviewed individually or in two-to-three person focus groups. Interviews were conducted until saturation. Residents and faculty were interviewed separately to facilitate discussion among their peers. Audio-recorded interviews were transcribed and coded by two independent investigators. A third investigator addressed differences in interpretation or missing codes. Codes were grouped to identify their apparent themes and thematic analysis was applied.

RESULTS

Eleven interviews were completed with 18 participants (7 attendings and 11 residents). Four themes emerged: 1) feelings of optimism, professional obligation, and curiosity, for providing HCV care, 2) concerns with physician-related barriers such as inexperience with the new treatment agents, 3) concerns with patient-related barriers such as medication non-adherence, and 4) a desire for additional education and a structured model of care. Interviews revealed openness to learning about treatments and building clinic capacity for providing HCV care. Suggestions to addressing physician and patient-related barriers include a multidisciplinary, team-based approach to care, involvement of expert opinion, and clinical decision support.

CONCLUSIONS

FM physicians feel a positive sense of professional duty and willingness to provide HCV care. However, in order to address physician and patient-related barriers, the need for a structured model of care and additional education on HCV treatments were noted.

Presented at the 2015 Society of Teachers of Family Medicine Annual Conference. Orlando, FL. 2015.



Vivian W. Tang, PharmD

Vivian received her PharmD from Oregon State University in 2014. Upon completion of her PGY-1 pharmacy resident at UPMC Shadyside, she will go onto complete her PGY-2 in Ambulatory Care at UPMC Presbyterian.

Mentor: Stephanie L. Ballard, PharmD, BCPS

Identification and Characterization of Hospital Readmissions Through the Emergency Department Secondary to Adverse Drug Events: A Retrospective Observational Study

Tran D, Rudine J, Schilling D, Peters C

PURPOSE

An adverse drug event (ADE) is an injury resulting from medical intervention related to medications. In 2006, the Institute of Medicine estimated that approximately 1.5 million preventable ADEs occurred each year in the United States. Few studies exist to understand the relationship between ADEs and hospital readmissions. This study aims to further characterize ADEs leading to hospital readmissions.

METHODS

A retrospective observational study was conducted at a tertiary medical center in Pittsburgh, PA. A report of patients with at least one ADE code applied upon discharge between July 2013 and June 2014 was generated. From this cohort, patients admitted through the emergency department within 30 days of a previous discharge were included. Information regarding demographics, medical history, home medications, suspected ADEs, and hospital stay was collected. Two independent investigators performed the ADE assessment. Contribution and causality were determined using the Hallas criteria. Preventability was assessed using the Hepler and Strand criteria. Severity was assessed using the modified National Coordinating Council for Medication Error Reporting and Prevention Index for categorizing medication errors.

RESULTS

There were 161 hospital readmissions due to ADEs. Of those patients, 51.6% were male, 80.1% were white, 64.0% had more than 10 home medications, 80.1% came from home, and 44.7% had Medicare as their primary health insurance. Mean length of time since last discharge was 12.3 days (± 8.23). Major therapeutic classes implicated in ADEs included antineoplastic agents (58.8%), blood coagulation modifying agents (25.4%), anti-infectives (19.6%) and opioid analgesics (15.6%). ADEs were considered preventable in 17.0% of the cases. Of the preventable ADEs, 90.2% were caused by non-antineoplastic agents.

CONCLUSIONS

Our data demonstrated a high proportion of non-preventable ADEs due to antineoplastic agents. A smaller proportion of ADEs were considered preventable. Improved management of medications such as anticoagulants and opioid analgesics may reduce hospital readmissions secondary to ADEs.

Presented at the American Society for Health-System Pharmacists (ASHP) Midyear Clinical Meeting, Anaheim, CA, December 2014.



Tina N. Tran, PharmD

Tina received her PharmD from the University of California, San Francisco School of Pharmacy in 2014. She is currently completing her PGY-1 pharmacy residency at UPMC Shadyside. Upon completion, she will be moving to Kenya to complete her PGY-2 training in Global Health with Purdue University.

Mentors: Casey Peters, PharmD, BCPS and Jennifer Rudine, PharmD

Prevalence of Drug Therapy Problems Related to Urinary Tract Infection Treatment After Positive Urinalysis

Trietley GS, D'Amico F, Kloet MA

PURPOSE

The Infectious Diseases Society of America recommends against antibiotics for asymptomatic bacteriuria unless the patient is pregnant or undergoing urologic procedures that involve risk of mucosal bleeding. Urinary tract infection (UTI) diagnosis and treatment can be challenging in patients presenting with less pointed symptoms like fever, nausea or abdominal pain without hallmark UTI symptoms. The emergency department (ED) is a potential source for urinalysis and urine culture mismanagement. To our knowledge, analysis of drug therapy problems (DTPs) caused by UTI prescribing practices in the ED has not been conducted.

METHODS

A retrospective, cross-sectional chart review evaluated a random sample of 300 patients who screened positive on urinalysis in the ED from January 1, 2013 to December 31, 2013. Patients 18+ years of age discharged from the ED were included. Patients pregnant or undergoing urologic procedures, as well as those with altered mental status or baseline dementia, were excluded. Charts were reviewed for the existence of a DTP. UTI symptoms were classified as hallmark, non-specific, or asymptomatic.

RESULTS

Prevalence of DTP was 67% (n=42, 95% CI 52-79%). DTPs were more prevalent with less specific UTI symptoms (65% in hallmark symptoms, 73% in non-specific symptoms, 88% in asymptomatic). The most common DTPs were wrong drug (n=14), unnecessary therapy (n=13), and inappropriate dose (n=12).

CONCLUSIONS

UTI treatment in ED patients with a positive urinalysis screen resulted in a high prevalence of DTPs, especially for patients without hallmark UTI symptoms. Inappropriate antibiotic treatment exposes patients to an unwarranted potential for harm. Pharmacists may be able to provide education to patients receiving antibiotics and to providers prescribing them in order to decrease the rate of unnecessary therapy, inappropriate antibiotic selection and dosing, and adverse drug reactions.

Presented at the 48th Annual Society of Teachers of Family Medicine Conference, Orlando, Florida, April 2015, and at the 21st Annual Teaching and Learning in Academic Medicine Conference, Pittsburgh, Pennsylvania, May 2015.



Gregory S. Trietley, PharmD

Gregory S. Trietley graduated from the University of Pittsburgh in 2014 with a Doctor of Pharmacy degree. He is currently a PGY1 resident at UPMC St. Margaret, and he will complete a PGY2 ambulatory care residency with a focus in family medicine at St. Margaret next year.

Mentor: Megan A. Kloet, PharmD, BCPS

Clinical Outcomes in Patients Treated with Prasugrel or Ticagrelor, Aspirin and Warfarin After Percutaneous Coronary Intervention

Verlinden NJ, Saul MI, Kane-Gill SL, Coons JC

PURPOSE

Approximately 20% of patients on oral anticoagulation have concomitant coronary artery disease that requires percutaneous coronary intervention (PCI). In these patients, triple therapy (TT) with aspirin, clopidogrel, and warfarin is the standard of care to reduce the risk of stent thrombosis and thromboembolic events. However, this combination imparts an excessive annual bleed risk of approximately 15-40%. Higher potency P2Y₁₂ inhibitors, including prasugrel and ticagrelor, have been introduced as alternatives to clopidogrel for PCI, although data evaluating these agents as part of TT are lacking. The purpose of this study is to compare the safety and effectiveness of the newer P2Y₁₂ inhibitors compared to clopidogrel in patients receiving warfarin and aspirin after PCI.

METHODS

This retrospective cohort study included patients who underwent PCI between July 1, 2010 and December 31, 2013 at UPMC and were discharged on TT with a P2Y₁₂ inhibitor, aspirin, and warfarin. Patients that received TT with prasugrel or ticagrelor were matched (1:3) to patients that received TT with clopidogrel based upon age (\pm 10 years), sex, and indication for PCI. The primary outcome was any bleeding event within 6 months. The secondary outcome included a composite of major adverse cardiovascular and cerebrovascular events defined as all-

cause death, non-fatal myocardial infarction, non-fatal ischemic stroke, target vessel revascularization, and stent thrombosis.

RESULTS

A total of 1051 patient visits were screened for treatment with aspirin, a P2Y₁₂ inhibitor, and warfarin at discharge. The final cohort consisted of forty-two patients who were discharged on prasugrel (n=32) or ticagrelor (n=10) and 126 patients discharged on clopidogrel as a part of TT. The average age of the cohort was 64 years and 71% of patients were male.

CONCLUSIONS

The results of this study will characterize the safety and effectiveness of newer P2Y₁₂ inhibitors compared to clopidogrel in patients receiving warfarin and aspirin after PCI. Conclusions will be drawn after final data analysis.

Presented at the cardiovascular pharmacist poster session at the American College of Cardiology 64th Annual Scientific Session and Expo, San Diego, CA, March 2015.



Nathan J. Verlinden, PharmD

Nathan is originally from Manitowoc, Wisconsin and received his PharmD from Drake University in Des Moines, Iowa in 2013. He completed his PGY1 pharmacy residency at the University of Toledo Medical Center in Toledo, Ohio. His practice interests include heart failure, arrhythmias, and anticoagulation. After his PGY2, Nathan plans on pursuing an academic faculty or clinical specialist position. In his spare time, Nathan enjoys hiking, exploring, and reading.

Mentors: James Coons, PharmD, BCPS (AQ-Cardiology), Sandra Kane-Gill, PharmD, MS, FCCM, FCCP

Incidence of BK Viremia in Sequential Transplant Recipients

Vu A, Schonder KS, Shullo MA, Tevar AD

PURPOSE

Post-transplant, patients are at an increased risk of developing infections including BK virus. Immunosuppression is considered a major risk factor for reactivation of this viral infection. The objective of this study is to determine the incidence of BK viremia and BK related complications in kidney transplant recipients who previously received a non-renal transplant compared to recipients receiving a de novo kidney transplant.

METHODS

A retrospective, cohort study design was used to compare all adult kidney transplant recipients at a single center. Recipients were divided into two different cohorts depending on previous transplant status. The study cohort included patients that had received a previous non-renal transplant at least one year prior and the control cohort included only de novo kidney transplant recipients. The study cohort was matched 1:2 with the control cohort based on age at time of kidney transplant and induction.

RESULTS

Incidence of BK viremia (plasma BKV DNA \geq 10,000 copies/mL) was not different between the study and control cohorts (6.2% vs 4.5%, $p=0.469$). Induction regimen did not impact BK viremia in either cohort ($p=NS$). Patients with a de novo kidney transplant who received a tacrolimus only immunosuppression regimen at one month post-transplant had an increased incidence of BK viremia compared to other immunosuppression regimens ($p=0.002$).

CONCLUSIONS

The incidence of BK viremia does not differ in sequential transplant recipients. Differences in immunosuppression regimen can increase the incidence of BK viremia in de novo kidney transplant recipients.

Presented at the ASHP Midyear 2014, Anaheim, CA; December 2014



Anh Vu, PharmD

Anh received her PharmD from the University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences in 2014. Upon completion of a PGY1 Practice Residency at UPMC Presbyterian, she will be completing a PGY2 in Solid Organ Transplantation at UPMC Presbyterian.

Mentors: Kristine S. Schonder, PharmD and Michael A. Shullo, PharmD

Deep Phenotyping for Acute Kidney Injury (AKI): An Automated Form of Detection for Community-acquired AKI

Weaver CB, Kane-Gill SL

PURPOSE

The majority of published literature on acute kidney injury (AKI) focuses on the subset of AKI occurring in-hospital, therefore little is known about the epidemiology, risk factors, and outcomes of patients whose AKI develops in the community (CA-AKI). The electronic health record has been used to identify adverse events by the creation of a high sensitivity algorithm for automated detection, called phenotyping. The goal of this study was to deploy an algorithm to phenotype drug-associated and non-drug-associated CA-AKI in elderly patients, ultimately creating an automated form of detection for these events.

METHODS

A retrospective chart review of patients presenting to the ED during a one year period at three UPMC hospitals with CA-AKI was performed. CA-AKI was defined as admission with a creatinine of 1.5 times baseline creatinine. Baseline creatinine was defined as the lowest creatinine within 1 year of visit. When unavailable, baseline creatinine values were estimated using the Modification of Diet in Renal Disease (MDRD) equation. Drug-associated AKI was identified through physician notation and home medication review. A highly sensitive algorithm was used on selected ED notes to identify common words, phrases, and themes that denoted CA-AKI. Frequencies of nephrotoxic medications listed in home medication summaries were recorded.

RESULTS

A total of 9,237 reports were reviewed. 5,236 (56.7%) patients had a baseline creatinine available; 774 of these met criteria for CA-AKI. 4,001 (43.3%) patients had a baseline serum creatinine calculated by the MDRD equation; 475 of these met criteria for CA-AKI. In total, 1,249 (13.5%) patients of 9,237 presented with CA-AKI. Data collection of drug-associated versus non-drug-associated reports and use of nephrotoxic medications is in process.

CONCLUSIONS

It is anticipated that this algorithm and the knowledge of common nephrotoxic medications used in this population will aid in the detection of CA-AKI and will identify avenues for improvement in patient safety.

Presented at the American Society of Health-System Pharmacists (ASHP) Midyear Clinical Meeting and Exhibition in Anaheim, California, 2014.



Cory Weaver, PharmD

Cory received her PharmD with an area of emphasis in research from West Virginia University in 2014. Her professional interests include critical care, research, and academia. After completion of her PGY-1 pharmacy residency, she will continue at the University of Pittsburgh Medical Center to complete a PGY-2 critical care residency.

Mentor: Sandra Kane-Gill, PharmD, MS, FCCM, FCCP

High Risk Medication Utilization Rates for a Medicare Part D Population after Implementation of a Prescriber Targeted Pilot Program

Wilberg WZ, Holowka J, Heasley J, Saba J

PURPOSE

High Risk Medication (HRM) utilization rates are reported annually to the Centers for Medicare and Medicaid Services (CMS). CMS also mandates medication therapy management (MTM) programs in Medicare Part D eligible populations, which involves two components. The first, a Comprehensive Medication Review (CMR), consists of an annual medication-focused patient interview. A CMR is offered to all eligible MTM patients, but must be accepted to participate in the CMR. The second component of an MTM program, Targeted Medication Review (TMR), includes quarterly faxes to identify possible medication issues. TMRs are completed for all patients targeted by the MTM program. HRM utilization may be assessed as part of the MTM service. In 2014, CVS/caremark implemented a pharmacist led prescriber targeted pilot program to further reduce HRM utilization rates in Medicare Part D members. The goal is to evaluate the impact of the addition of a prescriber targeted HRM program to a standard Medicare Part D MTM program.

METHODS

Hypoglycemic HRM utilization rates for a large Medicare Part D client were evaluated across three different groups of interventions. The first group included members who were prescribed an HRM but were not eligible for MTM services. The second group included members who were prescribed an HRM and were eligible for MTM services, but did not participate in the CMR. The third group included members who were prescribed an HRM, were eligible for MTM services, and accepted the CMR. Ongoing utilization rates were evaluated for each arm of the study based on members who had an additional claim for the HRM during 2014, after the Medicare Part D required outreach and/or the prescriber targeted pilot program. Impact of the prescriber targeted pilot was measured within each of the 3 groups based on ongoing utilization rates.

RESULTS

TBD

CONCLUSION

TBD

Presented at the 34th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2015.



William Wilberg, PharmD

Willie received his PharmD from the University of Minnesota College of Pharmacy in 2014 and completed a managed care residency at CVS Caremark in 2015. Upon completion of a managed care residency, he plans to practice in a managed care setting.

Mentor: Jamie Holowka, PharmD

Evaluation of Virtual Patient Technology for Interdisciplinary Education of Psychiatry Residents

Wilkening GL, Gannon J, Fabian T, Ross C, Brennan JL, Marcisin M, Benedict N

PURPOSE

Virtual patients (VPs) are patient encounters that allow learners to engage in simulated scenarios making clinical decisions for an on-screen patient.¹ VPs are unique pedagogic tools that allow for repetitious opportunities for learners to practice as healthcare professionals in *low-risk* environments, while also allowing evolving patient outcomes based on learners' decisions. Research on the design and integration of VPs into interdisciplinary psychiatric education and training does not exist.

METHODS

Third year psychiatry residents were allocated twenty minutes at four pharmacist-led, psychopharmacology education sessions to complete a VP case. Pre and post test questions were administered around each VP case. These assessment questions were validated by psychiatric physicians and pharmacists prior to implementation. Residents received feedback during a debriefing period following completion of each VP case. Secondary outcomes measured included resident satisfaction with VP session, average time to VP completion, and VP session attendance.

RESULTS

The percentage of questions answered correctly [mean (SD)] on the pre-test was 61 (10), 59 (14), and 47 (8) for cases 1, 2 and 3, respectively. Post-test scores were 88(8), 88(6), 84 (12) for cases 1, 2 and 3, respectively and were significantly improved ($p < 0.0001$). Combining all 3 VP cases, residents indicated that they were actively engaged (100%, n=18) and that they gained valuable clinical information (100%; n=18). Average time to VP completion was 22.1 min, 22.1 min, and 18.5 min for cases 1, 2, and 3, respectively. Ten unique resident learners attended 3 VP sessions; 5 residents attended all 3 sessions and 1 resident attended 2 sessions.

CONCLUSIONS

Resident application and understanding of advanced psychopharmacology is significantly improved through VP completion. Additionally, resident satisfaction with interdisciplinary education settings is favorably impacted with use of VPs.

Presented at the 18th Annual Meeting of the College of Psychiatric and Neurologic Pharmacists. Tampa, Florida. April 2015.



Gwendolyn L. Wilkening, PharmD

Lucy Wilkening received her PharmD from Southwestern Oklahoma State University College of Pharmacy. She completed a PGY-1 Pharmacy Practice residency and PGY-2 Psychiatric Pharmacy residency at Western Psychiatric Institute and Clinic of UPMC. This summer, she will begin working as an Assistant Professor of Pharmacy Practice at the University of the Incarnate Word Feik School of Pharmacy.

Mentor: Neal Benedict, PharmD

Comparison of Combination Dexmedetomidine Plus Benzodiazepines Versus Benzodiazepines Alone for Treatment of Alcohol Withdrawal Syndrome

Zielke MK, Ganchuk SR, Wilson LM

PURPOSE

Dexmedetomidine is a novel sedative agent that works by stimulating alpha-2 receptors in the central nervous system and has become an adjunctive agent for the treatment of delirium tremens (DTs) in alcohol withdrawal syndrome (AWS). Currently, the treatment of choice for DTs is benzodiazepines. These medications are associated with adverse effects such as respiratory depression and increased incidence of delirium. Studies comparing the combination of dexmedetomidine and benzodiazepines versus benzodiazepines alone have recently shown the benefit of dexmedetomidine on decreasing the amount of benzodiazepines that are necessary for the treatment of DTs. To our knowledge no study has addressed the effects of benzodiazepines plus dexmedetomidine on intensive care unit (ICU) length of stay and total hospital length of stay as primary outcomes or change in alcohol withdrawal scores.

METHODS

A single center, retrospective, case series is being conducted to compare ICU length of stay and total hospital length of stay between study populations. These serve as out primary outcomes. Secondary outcomes include change in alcohol withdrawal score and amount of benzodiazepine use. The populations include those patients admitted with an International Classification of Diseases, Ninth Edition (ICD-9 code) for “Alcohol Withdrawal” or “Alcohol Withdrawal Delirium” who received dexmedetomidine and benzodiazepines versus benzodiazepines alone for the treatment of alcohol withdrawal syndrome. The two populations were matched based on age, sex, and baseline alcohol withdrawal scores.

RESULTS

Results are currently pending at this time.

CONCLUSION

Evaluations are currently pending at this time.

Presented at ASHP Midyear Clinical Meeting, Anaheim, CA., 2014.



Megan K. Zielke, PharmD

Megan received her PharmD from Duquesne University Mylan School of Pharmacy in 2014 and is currently completing a PGY1 pharmacy residency at UPMC Mercy. Upon completion of her PGY1 residency, Megan will be completing a PGY2 Critical Care residency at University Hospitals Case Medical Center in Cleveland, OH. In her spare time, Megan enjoys playing various sports and rooting on her local Pirates!

Mentors: Steven R. Ganchuk, PharmD, Laura M. Wilson, PharmD, BCPS

Pharmacy Residency Programs

Post Graduate Year 1 (PGY1)

Pharmacy at UPMC Presbyterian Shadyside

Director: Heather Johnson, PharmD, BCPS

Pharmacy at UPMC Mercy

Director: Robert Simonelli, PharmD

Pharmacy at UPMC St. Margaret

Director: Jennie Jarrett, PharmD, BCPS

Assistant Director: Patricia Klatt, PharmD, BCPS

Pharmacy at UPMC McKeesport

Director: Jerad Heintz, PharmD, MBA

Pharmacy at UPMC Shadyside

Director: Stephanie Ballard, PharmD, BCPS

Pharmacy at Children's Hospital of Pittsburgh of UPMC

Director: Kelli L. Crowley, PharmD, BCPS

Pharmacy at UPMC Hamot

Director: Brad Cooper, PharmD

Managed Care at UPMC Health Plan

Director: Jessica Daw, PharmD, MBA

Managed Care at CVS Caremark

Director: Jennifer Heasley, PharmD

Community Pharmacy

**Gatti Pharmacy, Giant Eagle Pharmacy,
Rite Aid Corporation, University Pharmacy**

Director: Melissa Somma McGivney, PharmD,
FCCP, FAPhA

Post Graduate Year 2 (PGY2)

Ambulatory Care at

UPMC Presbyterian Shadyside

Director: Deanne Hall, PharmD, CDE, BCACP

Cardiology at UPMC Presbyterian Shadyside

Director: James Coons, PharmD, BCPS-AQ (CV)

Critical Care at UPMC Presbyterian Shadyside

Director: Pamela Smithburger, PharmD, MS, BCPS

Family Medicine at UPMC St. Margaret

Director: Roberta Farrah, PharmD

Geriatrics at UPMC Presbyterian Shadyside

Director: Christine Ruby-Scelsi, PharmD, BCPS,
FASCP

Geriatrics at UPMC St. Margaret

Director: Heather Sakely, PharmD, BCPS

Infectious Diseases

at UPMC Presbyterian Shadyside

Director: Brian Potoski, PharmD, BCPS-AQ (ID)

Medication Use Safety

at UPMC Presbyterian Shadyside

Director: Sandra Kane-Gill, PharmD, MSc,
FCCM, FCCP

Oncology at UPMC Cancer Centers

Director: James Natale, PharmD, BCOP

Pharmacy Residency Programs

Solid Organ Transplantation at UPMC Presbyterian Shadyside

Director: Michael Shullo, PharmD

Underserved Care and Global Health

Director: Sharon Connor, PharmD

Assistant Director: Lauren Jonkman, PharmD, BCPS

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