Resident Research
2012–13

University of Pittsburgh
School of Pharmacy

Message from the Dean

Patricia D. Kroboth, PhD

Dear Members of the Resident Class of 2013,

Congratulations! As individuals, you have distinguished yourselves among pharmacy practitioners by choosing residency training…and completing it. Further, you have placed yourselves among an elite few who have completed a school of pharmacy-based residency program. You have learned not only the basics of practice but also elements of teaching and research to prepare you for your careers. You have had the best of the academic and practice worlds because the School and its partners—UPMC Presbyterian, UPMC Shadyside, UPMC WPIC, UPMC St. Margaret, UPMC McKeesport, UPMC Mercy, UPMC Hamot, UMPC Health Plan, Childrens' Hospital of Pittsburgh of UPMC, Rite Aid, and CVS Caremark—have provided the rich environments for your residency experiences and learning. You have enriched each other with your pharmacy backgrounds from Florida, Massachusetts, Missouri, New Jersey, New York, Pennsylvania, Ohio, Rhode Island, South Carolina, South Dakota, Virginia, Washington, West Virginia, and Wisconsin.

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. The commitment is an investment that has already reaped benefits for you and that will continue to bring you distinction. 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.

Your final 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.

Congratulations, good luck, and keep in touch!

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, 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 thirteen of "America's Best Hospitals" according to the 2010 U.S. News and World Report rankings and is one of the leading integrated health care delivery systems in Western Pennsylvania. UPMC Presbyterian Shadyside, UPMC Mercy and UPMC St. Margaret hospitals participate in our residency programs.

UPMC Health Plan is the second largest insurer in Western Pennsylvania and in 2009 was ranked as the best in customer service in the region by J.D. Power and Associates. U.S. News & World Report ranked UPMC Health Plan in the top 10 percent of all commercial plans across America.

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.

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.

School Mission and Vision

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.

Our vision is to be an outstanding school of pharmacy, renowned for excellence in discovery and advancement of science-based use of medicines and other interventions to enhance the vitality and quality of life.

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 strict emphasis on personal accountability for the progress of their projects. The projects completed this year were highly patient-centered including topics such as medication safety, education, quality of care, process evaluations and clinical outcome assessments. 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 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: Neal Bennedict, Kim Coley, Amy Donihi, Deanne Hall, Jerad Heintz, Trish Klatt, Jason Markuss, James Natale, Robert Simonelli, Pamela Smithburger, Melissa Somma McGivney and Laura Wilson. The efforts of the program directors and research mentors is 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 Kroboth and Senior Associate Dean Randall Smith. We would like to thank Melissa Saul and Mary Beth Ducar for their contributions to data management for several of the retrospective database projects. We would be remiss not to mention the fine administrative support of Kathleen Woodburn. Most importantly, this program is successful because of the commitment of our outstanding residents.

Perceptions of smoking cessation from clients at an alcohol and other drug facility

Bhuiyan JS, Jonkman, JL, Connor SE, Giannetti V, Freyder P

PURPOSE

Smokers with substance use disorder have twice the expected rate of deaths attributable to tobacco use than in the general population. Despite the evident need for smoking cessation in this population, tobacco use dependence treatment is not routinely provided due to the ungrounded belief it will interfere with recovery from the primary substance use problem. Limited data exists on concurrent tobacco use dependence behaviors and beliefs that may indicate the unique challenges to smoking cessation this population faces. This study was conducted to determine the perceptions of clients in an alcohol and other drug treatment facility regarding the provision of smoking cessation services.

METHODS

Semi-structured, one-on-one in-person interviews were conducted with clients using standardized qualitative research methods at Salvation Army Harbor Light Center, a 90-day residential alcohol and other drug treatment facility in Pittsburgh, PA. All clients who are current or past smokers were invited to participate in this study. Baseline demographic data will be obtained via survey methods. Interviews were transcribed verbatim and transcripts verified with other members of the research team. Codes were developed and themes were identified using Grounded Theory to generate a theory/hypothesis. Survey data was evaluated using descriptive statistics. Data analysis will be conducted simultaneously to identify a point of saturation.

RESULTS

A total of 11 interviews have been conducted and transcribed. Themes identified include motivations, spiritual support, self-identification/labeling as a smoker, peer pressure, smoking cigarettes as the 'lesser evil,' atmosphere of substance use facility, and context of a substance use program. Further analysis is ongoing.

CONCLUSIONS

This data will help this site and other similar sites better understand the perceptions of clients regarding their smoking and smoking cessation during alcohol and other drug treatment. We hope that this data will help to tailor smoking cessation services to the needs of the population – both at this program and other similar programs. Further, the data may help to elucidate the role of the pharmacy student in providing smoking cessation services to this population.

Presented at the College of Psychiatric and Neurologic Pharmacists Annual Meeting in Colorado Springs, Colorado, April 2013.

Jennifer S. Bhuiyan, PharmD

Jennifer received her PharmD from St. John's University College of Pharmacy and Allied Health Professions in Queens, NY and completed a PGY1 Pharmacy Residency at The Brooklyn Hospital Center in Brooklyn, NY. After the completion of the PGY2 Pharmacy Residency in Underserved Care/Global Health, she will be an Assistant Clinical Professor at Northeastern University's Bouve College of Health Science's School of Pharmacy in Boston, MA with a practice site at a Community Health Center with a focus on family medicine/international health. Outside of residency life, Jennifer enjoys spending time with her family and friends, reading and traveling.

Faculty Mentors: Sharon Connor, Pharm.D. and Lauren Jonkman, Pharm.D., MPH, BCPS

National trend in modafinil overexposures over a ten-year period: a retrospective review

Bohnenberger KA, Krenzelok EP

PURPOSE

Modafinil is a non-amphetamine stimulant indicated to improve sleepiness. Previous studies have described the toxic effects and drug dose information in an attempt to develop triage and treatment guidelines for modafinil overdose. This study was conducted in order to determine whether a trend in overexposures exists and in what populations these overexposures are most commonly reported.

METHODS

A retrospective review of the AAPCC National Poison Data System (NPDS) for all cases of single-substance ingestion of modafinil with follow-up to a known outcome from January 1, 2001 to December 31, 2010 was performed. Data collected included age, sex, acuity of exposure, dose ingested, reason for exposure, locations of exposure, locations of the management of exposure, and associated medical outcome. Patients with and without effect were compared in relation to other variables by means of odd ratios (ORs).

RESULTS

There were a total of 1,100 cases of modafinil overexposures with known outcomes, 600 (54%) of which were female. Patients aged five years or less comprised 33% (n=367) of reported overdoses. Seventy-seven percent (n=836) of cases were acute ingestions. The majority of reported modafinil overdoses were unintentional (27%). Of the intentional overdoses (n=302), 203 (67%) were reported to have been suspected suicides. Effects were classified as none (n=532), minor (n=339), moderate (n=222), and major (n=7). There was no observable trend in overexposures over time. Compared to patients age <5 years, patients aged 6-17 years (OR 3.6; 95%CI 2.4-5.5; p<0.001), 18-29 years (OR 10.4; 95%CI 6.8-16.0; p<0.001), 30-49 years (OR 8.3; 95%CI 5.7-12.0; p<0.001), and >50 years (OR 6.1; 95%CI 4.0-9.2; p<0.001) were more likely to have a minor, moderate or major effect. Patients with an intentional overexposure were more likely to have an effect than those with an unintentional overexposure (OR 5.2; 95%CI 3.9-7.1; p<0.001).

CONCLUSIONS

Modafinil overexposure appears to be mild in most cases. No apparent trend in overdose over time exists.

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2013.

Kristin A Bohnenberger, PharmD

Kristin received her PharmD from Wilkes University Nesbitt School of Pharmacy. After completion of her PGY1 Pharmacy Practice Residency, Kristin will complete a Clinical Fellowship in Toxicology/Emergency Medicine at USVI-Florida Poison Information Center at Shands-Jacksonville.

Faculty Mentors: Edward Krenzelok, PharmD, FAACT, DABAT

The Impact of Integrative Medicine, Diabetes Group Visits on Diabetic Outcomes

Bragg SW and Desai KM

PURPOSE

Diabetes is an enormous healthcare resource burden and medical professionals often struggle to adequately manage this condition in the typical 15-minute office visit. The limited time and resources available in the traditional setting can potentially lead to suboptimal patient care. The group visit care model has been studied and reported to improve medical management, enhance patient and physician satisfaction, and decrease healthcare costs. This project was started to evaluate whether comprehensive integrative medicine group visits can improve diabetic outcomes at Lawrenceville Family Health Center.

METHODS

Patients participated in monthly diabetes group medical visits with a team of physicians, pharmacists, nurses, and other providers. Group visits included standard medical care for diabetes, patient education sessions, group dynamics to mentor other patients, and integrative medicine therapies. Patients were assessed for baseline health parameters to identify changes in their medical outcomes over time. The primary outcome measures are hemoglobin A1c, blood pressure, and LDL cholesterol levels.

RESULTS

Preliminary results show improvements in hemoglobin A1c values and moderate improvements in LDL cholesterol, particularly in patients who attend regularly. Patients' baseline blood pressure measurements were generally well controlled and remained so during group medical visits.

CONCLUSIONS

Diabetes group visits are a sustainable and effective model for improving diabetes care in patients with complex needs. They can offer time for delivering high quality patient education, improve patient and provider satisfaction, and offer an opportunity for teaching residents and students of an interdisciplinary team. The group medical visit model can also be cost effective as they are billable medical visits.

Presented at: 46th Annual Spring Conference Society of Teachers of Family Medicine; Baltimore, MD, 2013.

32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors; Hershey, PA, 2013.

Scott Bragg, PharmD

Scott is from Cross Lanes, West Virginia, and received his PharmD from West Virginia University in 2011. Outside of pharmacy, he enjoys the outdoors, cooking, and cheering on the West Virginia University Mountaineers. After completing a PGY2 Pharmacy Residency in Family Medicine, Scott will join the faculty with the South Carolina College of Pharmacy (MUSC campus) as an Assistant Professor.

Faculty Mentor: Ronald Campbell, PharmD, BCPS.

Comparison of vancomycin pharmacokinetics in spinal cord injury patients versus non-spinal cord injury patients.

Cadwalader JC, Zielke MK

INTRODUCTION

Studies have shown that vancomycin displays a longer elimination half-life in patients with spinal cord injury which may result in an increased risk for nephrotoxicity. The primary objective of this study is to determine whether there is a statistical difference in vancomycin trough concentrations in patients with spinal cord injury versus patients without.

METHODS

This study has been approved by the IRB. Data was collected in a retrospective manner and consisted of age, gender, height, weight, serum creatinine, spinal cord injury status, vancomycin dose and frequency, and vancomycin trough concentration. Patients with and without spinal cord injury receiving vancomycin treatment were matched by age, renal function, and vancomycin dose. Patients included in the study received at least three doses of vancomycin and a subsequent trough within one hour prior to the fourth dose. Exclusion criteria consisted of patients who were dialysis dependent, received perioperative vancomycin, had a creatinine clearance of less than 30 mL/min, or were less than 18 years old. The matched case-control groups were compared using a non-parametric Wilcoxon signed rank test.

RESULTS

The median trough value for the case group was 16 mcg/mL (7-30 mcg/mL) and 13 mcg/mL (4-30 mcg/mL) in the control group; P = 0.100.

DISCUSSION

There was no statistical difference between the case and control median vancomycin trough levels which suggests that no additional considerations are necessary when dosing vancomycin in spinal cord injury patients. The limitations of this study are that the onset of spinal cord injury was not taken into consideration during enrollment, there were a low number of matched case-controls, and it was retrospective in design.

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2013.

John Carroll Cadwalader, PharmD

John Carroll Cadwalader received his PharmD from the Massachusetts College of Pharmacy and Health Sciences – Worcester. After completion of the PGY1 pharmacy residency he will pursue a second year residency in health system pharmacy administration at UPMC Presbyterian. He enjoys cycling, reading, and dining out of his price range.

Faculty Mentors: Sandra Shinsky, PharmD, Laura Wilson, PharmD BCPS.

Evaluation of clinical failure rates in patients with MRSA infections that have a vancomycin MIC of 2 mcg/mL

Burnheimer SA, Markuss J, Safranyos M, Raskind J, Weitzman J

PURPOSE

Methicillin-Resistant Staphylococcus aureus (MRSA) infections with elevated MICs to vancomycin may have higher rates of clinical failure when this antibiotic is used. Most evidence to date has been for bloodstream infections. We hypothesize that the same treatment failure exists regardless of the infection site between patients treated with vancomycin and patients treated with other antibiotics. The purpose of this study is to evaluate rates of treatment failure among patients at the University of Pittsburgh Medical Center St. Margaret Hospital.

METHODS

This study is a retrospective chart review conducted at UPMC St. Margaret Hospital. Patients at least 18 years of age with cultures that grew MRSA with an MIC of 2 mcg/mL were eligible for inclusion. Patients with skin and soft tissue cultures were excluded. Patients were stratified to one of three groups: pure vancomycin treatment, pure other treatment, and non-pure treatment. The primary endpoint of this study was clinical failure, which includes treatment failure, 30-day readmission due to infection, and 30-day all-cause mortality. The effect of an infectious disease (ID) consultation on clinical failure was a secondary outcome.

RESULTS

237 positive cultures were identified from December 2009 to October 2012. 116 cultures were excluded: 70 due to a duplicate culture, 46 due to no treatment received. A total of 121 patient cultures were included in the final analysis. Of these, 49 patients were in the pure vancomycin group, 15 in the pure other treatment group and 57 in the non-pure group. Rates of clinical failure for the above groups were 28.5%, 20%, and 31.5% respectively. This was not statistically significant. Over 80% of patients studied had an ID consultation. Effect of an ID consultation was not statistically significant.

CONCLUSIONS

No differences in clinical failure rates were found between the treatment groups. Limitations for this study include single-centered patient population, small group sizes, biases of the infectious disease physicians, patients lost to follow-up and the MicroScan not reporting an MIC to vancomcyin at 1.5 mcg/mL dilution.

Gregory Castelli, PharmD

Gregory is from Archbald, Pa., and received his PharmD from the Wilkes University Nesbitt College of Pharmacy. After the completion of his PGY1 pharmacy residency, he will be staying at UPMC St. Margaret for a PGY2 in family medicine. During his free time, Gregory enjoys playing ultimate frisbee, geocaching, and the outdoors.

Faculty Mentors: Kara Plauger, PharmD

Evaluation of readmission rates after initiating pharmacist-led medication education to congestive heart failure patients

Crooks R, D'Antonio N, Heintz J

PURPOSE

CMS defines a readmission rate as an admission to a hospital within 30 days of discharge from the same or different hospital. The target monthly readmission rate for hospitals is 24.7%. In fiscal year 2013, these readmission rates will begin to dictate money reimbursed to hospitals. The primary objective of this quality improvement project was to evaluate the reduction in readmission rates after initiating pharmacist-led medication education to congestive heart failure (CHF) patients. Secondary objectives were the evaluation of the percent of patients that received medication lists and instructions and the percent of patients able to explain the purpose of their medications.

METHODS

This quality improvement project was piloted on the step-down unit from October 2012- February 2013. Patients were included based on two criteria: primary or secondary ICD9 codes for the diagnosis of CHF and floor location in hospital. Patients were excluded if they were from a long term care facility. Patients diagnosed with CHF were identified daily and this list was sent to the pharmacist to review each patient's CHF and anticoagulation medications. The pharmacist provided medication education to each patient prior to discharge. Readmission rates were generated monthly via Cognos™ and quality assessment was done within one week of discharge by nursing over the phone using a patient questionnaire.

RESULTS

The average readmission rate eleven months prior to pharmacist counseling for the step-down unit was 22.08%. After initiating pharmacist counseling for five months, the average readmission rate for the unit was 18.06%. Following pharmacist intervention, the amount of patients receiving medication lists and comprehending their medications increased from an average of 83.33% to 100%.

CONCLUSION

Pharmacist-led medication education was shown to decrease congestive heart failure readmission rates.

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2013.

Rebecca A. Crooks, PharmD

Rebecca received her PharmD from the University of Pittsburgh School of Pharmacy. After the completion of the PGY1 Pharmacy Residency at UPMC McKeesport Hospital, Rebecca will begin her career as a clinical pharmacist at UPMC Bedford Memorial Hospital.

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

Identifying key factors associated with successful integration of patient care services into dispensing workflow: a traditional community chain pharmacy evaluation

Dombrowski SE, McGrath SH, Bacci JL, Coley KC, Bobby BJ, McGivney MA

OBJECTIVE

To identify workflow, leadership, and organizational factors enabling provision of patient care services in high-performing chain community pharmacy practices through workflow observation and key informant interviews.

METHODS

Pharmacies were identified as high-performing based on patient care programs and immunization rates. Key informant interviews were conducted with pharmacists and pharmacy staff to expose self-identified key factors regarding leadership and organizational structure and culture associated with the success of implementing patient care services. A survey was used to collect demographic information for the pharmacy. Workflow observations were then conducted at each pharmacy by student pharmacists to note distribution of patient care services offered and adaptations in workflow allowing for patient care. Workflow observations and demographic information were summarized and evaluated for commonalities in order to create a model for "best practices." Key informant interviews were audio recorded and transcribed by a third party and analyzed using Grounded Theory to elicit themes.

PRELIMINARY RESULTS

Research in progress. To date, 18 key informant interviews (13 pharmacist, 5 staff), 6 workflow observations, and 13 demographic surveys have been completed. Five preliminary themes elicited from interviews include: pharmacists have a patient care vision; utilization of corporate defined dispensing workflow; delegation of specific tasks to technicians; open communication between pharmacists and technicians; and a forward-thinking, proactive pharmacy manager who embraces change. Preliminary workflow observations demonstrated smooth workflow; pharmacy staff who understood their roles within workflow; patients well known to the pharmacists and staff; and interaction between pharmacists and patients beyond required counseling. Demographic surveys revealed an average of 10.6 years since graduation for pharmacists with 64% of the pharmacists having a PharmD. Pharmacies surveyed fill an average of 1100 prescriptions/week, 46% had a patient care room, 23% were "Wellness Stores", 23% had an on-site clinical pharmacist, and 62% of pharmacies employed pharmacy interns.

CONCLUSIONS

The key factors identified can assist other community pharmacists in evaluating their pharmacy practice and implementing patient care services.

Presented at the American Pharmacists Association Annual Meeting, Los Angeles, CA, 2013.

Sarah Krahe Dombrowski, PharmD

Sarah received her PharmD from the University of Pittsburgh School of Pharmacy in 2012. She received her BS in Biochemistry and Molecular Biology from Penn State University in 2008. Sarah is passionate about interprofessional collaboration and the role of the pharmacist on the healthcare team in chronic care management of patients in the community. To expand upon her interests, she will be joining the UPMC St. Margaret team as a PGY2 in Family Medicine.

Faculty Mentors: Melissa Somma McGivney, PharmD; Stephanie Harriman McGrath, PharmD; Lauren Jonkman, PharmD, MPH, BCPS; Christine Ruby-Scelsi, PharmD, BCPS; Patricia Klatt, PharmD, BCPS

Updating Providers on the MASCC Risk Criteria for Febrile Neutropenia to Transition Low-Risk Patients to Outpatient Management

Eplin D, Stebbings A, Duggal S, Wirth S, Friedland D, Brenner T

PURPOSE

Febrile neutropenia is a common complication in cancer patients, occurring in 10-50% of solid-tumor malignancies, and up to 80% of hematological malignancies. IDSA and ASCO febrile neutropenia treatment guidelines recommend high-risk patients (MASCC<21) receive inpatient treatment with intravenous antibiotics, while low-risk patients (MASCC≥21) can be treated with oral antibiotics as an outpatient after initial observation. The primary aim of this project is to determine if education on the MASCC criteria will significantly affect the rate of appropriate discharges within 48 hours of low-risk febrile neutropenia patients at UPMC Shadyside.

METHODS

This is a prospective, time-series electronic chart review of febrile neutropenia patients admitted to UPMC Shadyside, with a retrospective control group. The control group was collected from 2009 to 2011 to determine baseline percentage of low-risk patients that were discharged for appropriate outpatient management. Education was provided to update physicians, fellows, and mid-level practitioners on the MASCC criteria and guidelines for discharge on oral antibiotics in late 2012. The study group is being collected throughout 2013 to assess the primary aim.

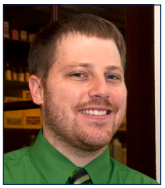
RESULTS

A total of 248 patients were included in the control group analysis. 28.8% (15/52) of patients with MASCC scores ≥21 and no previous prophylactic antibiotics were discharged within 48 hours compared to 44.3% (79/178) in recent literature. Patients with MASCC scores <21 were associated more with hematological malignancies, a higher death rate during hospitalization, and more prophylactic antibiotic use. Patients with MASCC scores ≥21 consisted mainly of solid tumor malignancies, very few re-admissions, and no deaths during hospitalization.

CONCLUSION

The historical rate of discharges within 48 hours for low-risk febrile neutropenia patients is suboptimal at UPMC Shadyside compared with recent literature. Data will be collected throughout 2013 to assess if updating providers on the MASCC criteria will impact the transition of low-risk patients to outpatient management.

Presented at the 9th annual Hematology/Oncology Pharmacy Association (HOPA) conference, Los Angeles, CA, March 2013.



Dwight David Eplin, PharmD

David received his PharmD from West Virginia University in 2011. He completed a PGY-1 pharmacy practice residency at the VA Medical Center in Huntington, WV. In addition to his oncology residency, David enjoys camping, kayaking, and watching the Pirates and Penguins. After the completion of his PGY-2 Hematology/Oncology pharmacy residency, David will be staying on at UPMC Shadyside as an oncology clinical pharmacy specialist.

Faculty Mentors: Alison Stebbings, PharmD, Shrina Duggal, PharmD BCOP, Scott Wirth PharmD BCOP, David Friedland MD, and Timothy Brenner PharmD BCOP

Impact of a Medicaid prescription limitation policy on health care utilization

Fleischman M, Hall D, Yahnkee A, Ridenour T, Fischer G

PURPOSE

Pennsylvania State Medicaid implemented a policy in 2012 that limits prescription coverage to six prescriptions per month. Other State Medicaid programs have attempted to implement similar medication restrictions, which demonstrated decreased adherence to life-sustaining medications and increased health care utilization. This study was designed to determine if a limitation on number of prescriptions per month negatively impacts patient health care.

METHODS

An intensive within person retrospective chart review investigates the impact of this policy using data from electronic medical charts and prescription profiles of a large healthcare institution. The study timeframe was September 1, 2011 through December 31, 2012. Patient outcomes that indicate health care utilization and medication adherence post-intervention were compared to baseline for Medicaid beneficiaries, and then differences between these outcomes were compared to a control group consisting of beneficiaries covered by an insurance plan that did not implement a limitation policy. Patients qualified for the study if they filled six prescriptions in a month, were 21-64 years of age, were not pregnant or 60-days post-partum, and had a documented encounter at the institution.

Mixed model trajectory analysis (MMTA) was used to test proposed hypotheses. Compared to traditional ANOVA, MMTA is designed specifically for longitudinal data, does not assume homoscedasticity, and facilitates much greater flexibility in the trends that can be detected (e.g., sudden mean shift, change in linear trend, or logarithmic growth).

RESULTS

Results are currently pending. Number of encounters for hospitalizations, emergency department visits, primary care and specialty care outpatient visits, and outpatient procedures are being analyzed to determine health care utilization, and average medication possession ratio is being analyzed to determine medication adherence. Patients are considered adherent if the average medication possession ratio is 0.8 or greater.

CONCLUSIONS

This study will demonstrate practice application for a small sample study design. Results will be critically evaluated for health and safety outcomes and shared with the Pennsylvania Pharmacist Association.

Megan E Fleischman, PharmD

Megan received her PharmD from the University of Wisconsin-Madison School of Pharmacy and completed a PGY1 Pharmacy Residency focused in Ambulatory Care with Monroe Clinic in Wisconsin. After the completion of the PGY2 Ambulatory Care Pharmacy Residency, Megan will join the University of Illinois-Chicago College of Pharmacy and College of Medicine as a Clinical Assistant Professor and her clinical practice will be in family medicine.

Faculty Mentors: Deanne L Hall, PharmD, CDE, BCACP and Neal Benedict, PharmD

Comparison of the cost associated with the management of acute hemorrhage in trauma patients taking dabigatran versus warfarin therapy

Guido L, Simonelli R, Wilson L

PURPOSE

Warfarin and dabigatran carry significant hemorrhagic risk, whereby rates of major hemorrhage are similar between agents. Warfarin anticoagulation can be reversed with phytonadione and there are established guidelines to manage bleeding in patients receiving warfarin. Dabigatran does not have an antidote and management of bleeding in patients receiving dabigatran is not well established. Costs related to hemorrhage in previously published cost analyses were assigned the same monetary values for both agents. This study was conducted to compare the cost of managing traumatic bleeding in patients receiving warfarin versus dabigatran therapy.

METHODS

A retrospective medical record review was conducted in patients greater than 18 years old who presented with a traumatic bleeding event while receiving dabigatran or warfarin upon admission. The total cost of interventional strategies employed to manage the hemorrhagic event and cost of length of stay were compared between groups. Impact on ICU length of stay, overall length of stay, and in-hospital mortality were assessed as secondary outcomes.

RESULTS

The median total cost was $18,676.45 (IQR = $30,305.90) in the warfarin group (n=19), compared to $13,460.23 (IQR = $13,284.70) in the dabigatran group (n=22) (p = 0.200). ICU length of stay was 5.07 ± 5.58 days in the warfarin group, compared to 3.14 ± 5.35 days in the dabigatran group (p = 0.052). Total length of stay was 6.17 ± 5.58 days in the warfarin group, compared to 6.37 ± 8.30 days in the dabigatran group (p = 0.685). The in-hospital mortality rate was 26.3% in the warfarin group and 18.2% in the dabigatran group (p = 0.709).

CONCLUSIONS

The total cost of managing acute hemorrhage in patients taking dabigatran or warfarin was similar between agents. The trend for ICU length of stay was shorter in patients receiving dabigatran as compared to warfarin, but overall length of stay and in-hospital mortality were similar.

Presented at: 2012 ASHP Midyear Clinical Meeting, Las Vegas, NV, 2012

32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, PA, 2013

Laura Guido, PharmD, MBA

Laura received her Doctor of Pharmacy and Master of Business Administration from Duquesne University in 2011. In addition to residency life, Laura enjoys outdoor activities and spending time with her dog. After completion of the PGY1 Pharmacy Residency at UPMC Mercy Hospital, Laura wants to utilize her clinical, business, and communication skills to pursue a position within the pharmaceutical industry.

Faculty Mentors: Robert Simonelli, PharmD, Laura Wilson, PharmD, BCPS

The impact of a pharmacist-directed program to improve vaccination documentation, knowledge, and compliance in potential renal, liver, and pancreas transplant recipients.

Ingemi AI, Schonder KS, Thorpe CT, Shullo MA, Johnson HJ, Tevar A.

PURPOSE

Although it is well documented that transplant recipients should have completed the full complement of recommended vaccines prior to transplant, vaccination assessment has not been common. The study was conducted to assess the effects of establishing a pharmacist-directed vaccination program in the pre-transplant abdominal transplant clinic on vaccine documentation, compliance, and patient vaccine beliefs.

METHODS

The study was conducted using a pre-post intervention study design. First, to assess the impact of the intervention on vaccination rates, whether or not patients were documented as up-to-date on indicated vaccines at the completion of the pre-transplant clinic visit was compared between patients receiving the pharmacist-directed intervention and a retrospective control. Second, changes in vaccine knowledge and attitudes from pre-intervention to post-intervention were assessed in the intervention group via an established survey. Last, to describe the process of implementing the pharmacist-run assessment, the time spent with each patient to document vaccines, recommend vaccines, and educate about vaccines was recorded.

RESULTS

Interim analyses included 291 patients in the retrospective control group and 150 patients in the intervention group. Patients in the intervention and control groups were similar with regard to socio-demographics (41% female, mean age 54 years [SD=13.]) and transplant site (75% kidney and/or pancreas; 25% liver or liver/kidney) Overall, 87% of patients were not up-to-date with their vaccines at the time of their transplant evaluation visit, allowing the pharmacist to make an average of 1.8 vaccine recommendations per patient. Multivariate logistic regression analyses revealed that implementation of the pharmacist vaccine assessment greatly increased the odds of an indicated vaccine being documented as up-to-date in the medical record compared to the retrospective control (OR 23.0, 95% CI 16.0-33.0). T-tests on the intervention group's pre-visit and post-visit vaccine survey revealed increases in positive attitudes about vaccines, by a magnitude of 0.11 on a 5-point scale (95% CI, 0.02-0.20). Lastly, the average time spent by the pharmacist documenting vaccine histories, educating the patient, and making vaccine recommendations was 5.8 minutes per patient.

CONCLUSIONS

A pharmacist-run vaccine assessment program in the transplant evaluation clinic can increase the rate of vaccine compliance, positive attitudes toward vaccines, and can be achieved with a minimum time requirement.

Amanda I. Ingemi, PharmD, BCPS

Dr. Ingemi received her PharmD from the University of Rhode Island. She then completed her PGY1 pharmacy practice residency at Henry Ford Hospital in Detroit, Michigan. She plans to pursue a transplant pharmacist position at a major tertiary center upon completion of her PGY2 residency. She is also interested in research and education. In her spare time, she enjoys running and playing hockey.

Faculty Mentors: Kristine S. Schonder, PharmD, Carolyn T. Thorpe, PhD, MPH, Heather J. Johnson, PharmD BCPS, Michael A. Shullo, PharmD, Amit Tevar, MD

Patients continuing insulin following hospitalization: patient satisfaction and medication availability in the immediate post-discharge period

Johnson AS, Donihi AC

OBJECTIVE

To evaluate medication access related to insulin products following hospital discharge and to assess patient satisfaction with the insulin discharge process at UPMC Presbyterian Hospital.

METHODS

One-hundred patients discharged to home on insulin were contacted via telephone within 72 hours of discharge. Patients were questioned to determine when they filled their insulin prescriptions following discharge and their satisfaction with the insulin discharge process. A scale of 1 (not satisfied) to 5 (very satisfied) was used to rank patient satisfaction.

RESULTS

Of 100 patients, 78 did not receive a prescription because they continued home therapy, 4 received insulin from the hospital's outpatient pharmacy before discharge, and 18 actually received a prescription for insulin upon discharge. Of these 18 patients, 14 (78%) rated this process as 5, 2 (11%) as 4, and 2 (11%) as 2. Seven patients (39%) had their prescription filled at an outpatient pharmacy, 7 (39%) already had the insulin at home, 2 (11%) were sent home with their partially-used insulin from the hospital, and 2 (11%) did not get their prescription filled although they did not have insulin at home. Of the 7 patients who filled prescriptions, 6 (86%) did so on the day of discharge and 1 (14%) waited 2 days after discharge. Five of the 7 (71%) patients rated the process of filling their prescription as 4 or 5. Overall, 18 of 100 patients remembered being educated about their insulin while hospitalized, and 83% were "very satisfied" with this education.

CONCLUSIONS

In summary, 3 of 18 patients (17 %) did not fill their insulin prescription or have insulin at home during the first 2 days following hospital discharge. We anticipate that we will improve insulin access and patient satisfaction if we can implement a program to send partially-used insulin pens home with patients upon discharge.

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors. Hershey, PA. 14 May 2009

Amanda S. Johnson, PharmD

Amanda received her PharmD from the University of Pittsburgh School of Pharmacy. Outside of work, Amanda enjoys spending time with her family, playing the piano, and cheering on the Panthers from her beloved alma mater. After completing her PGY-1 Pharmacy Practice Residency, Amanda will continue at the University of Pittsburgh Medical Center to complete two PGY2s, one in management and one in critical care. Amanda will also be pursuing her Master's degree in Health Administration from the University of Pittsburgh's Graduate School of Public Health.

Faculty Research Mentor: Amy C. Donihi, PharmD, BCPS

Pilot study of clinical pharmacist utilization of pRIFLE score in critically ill pediatric patients

Kattner LE, Crowley KL

PURPOSE

Current practices for the estimation of renal function in critically ill pediatric patients are based upon Bedside Schwartz formula that relies on serum creatinine alone, which may not reflect an abrupt decline in renal function in this population. A recently developed system for the classification of acute kidney injury (AKI) for critically ill pediatric patients called "pRIFLE" is a uniform means of classifying AKI based upon changes in both creatinine clearance and urine output. pRIFLE may be useful for clinical pharmacists for the earlier prediction of dosing and dose adjustments of nephrotoxic medications if a correlation exists between rising drug levels and pRIFLE classification.

METHODS

A 6-month retrospective chart review was conducted for patients ages 1 month to 18 years admitted to the PICU at Children's Hospital of Pittsburgh of UPMC. Patients were selected for analysis based upon initiation of vancomycin, amikacin, gentamicin, or tobramycin. Data collected includes patient demographics, serum drug levels and relation to dose, pRIFLE score, and Bedside Schwartz calculation.

RESULTS

315 vancomycin, 18 tobramycin , and 8 gentamicin data points and associated pRIFLE scores were evaluated. Mean troughs for vancomycin increased in relation to severity of pRIFLE AKI classification with a correlation coefficient of 0.65. When data was selected to include only steady state levels, the correlation coefficient was determined to be 0.80. Data for aminoglycosides was insufficient to analyze in order to determine a correlation.

CONCLUSIONS

Vancomycin data analysis demonstrated a moderate positive correlation between vancomycin troughs and severity of AKI defined by pRIFLE, however, when data was selected to include only steady state troughs, this demonstrated a strong positive correlation between rising troughs and AKI severity. Data was insufficient to determine a correlation for tobramycin, gentamicin, and amikacin.

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2013.

Lauren E. Kattner, PharmD

Lauren received her PharmD from the University of the Sciences in Philadelphia. In her free time, Lauren enjoys baking and spending time with her family. After completion of the PGY1 Pharmacy Residency, Lauren is planning on acquiring a position as a pediatric clinical pharmacist.

Faculty Mentors: Kelli Crowley, PharmD, BCPS

Validation of risk factors for adverse drug events in critically ill patients

Kloet MA, Politz TR, Saul MI, Kane-Gill SL

PURPOSE

Adverse drug events (ADEs) account for 47% of all adverse medical events in the intensive care unit (ICU). Understanding patients at risk for ADEs can assist with surveillance and possible prevention of ADEs. The purpose of this study was to validate patient-related and drug-related risk factors ascertained previously with voluntarily reported ADE data. Voluntary reporting underestimates the actual number of ADEs, so this study used medical record review for the identification of ADEs and related risk factor analysis.

METHODS

Approval to perform this study was obtained by the University of Pittsburgh Institutional Review Board. De-identified data was obtained from the Medical Archival Repository System (MARS). ADEs were identified by review of ICU transfer summaries or progress notes on the day of transfer for patients discharged from a 32 bed medical ICU during January 2012 to December 2012, and had a length of stay $\geq$1 day. The presence of an ADE was determined using the Harvard Medical Practice Scale (MPS) and the modified Leonard Evidence Assessment Scale. A list of 34 potential risk factors identified in the literature was evaluated. Risk factor data was obtained through electronic medical record review, demographics, ICD-9 diagnostic and procedure codes, and medication orders.

RESULTS

A total of 380 patient visits were included. Patients were 57% male, 73% white, and had a mean age of 58 years. The mean number of drugs received on day 1 of their ICU stay was 9, and patients received a mean of 26 total drugs during their entire ICU stay. To date, 30 patients and 94 notes on the day of ICU discharge have been reviewed. One or more ADEs were detected in 83% of patients evaluated, with bleeding (n=6), hematological abnormalities (n=5), hypotension (n=4), and acute kidney injury (n=4) being the most common events.

CONCLUSION

In progress

Megan Anne Kloet, PharmD, BCPS

Megan is originally from Wellington, Florida. She graduated Cum Laude from the University of Florida College of Pharmacy in May 2011. Prior to entering pharmacy school, she received her BS in Food Science and Human Nutrition from the University of Florida in May 2007. Megan completed her PGY1 pharmacy residency at UPMC Presbyterian/Shadyside, and is currently completing her PGY2 critical care specialty residency. Her professional interests include critical care, infectious diseases, teaching, and medication safety.

Faculty Research Mentor: Sandra Kane-Gill, PharmD, MSc, FCCP, FCCM

Impact of adding moxifloxacin to patients stabilized on warfarin therapy

Kolonich H, Hilton L, Wilson L, and Simonelli R

INTRODUCTION

At our institution, it has been the practice to interchange ciprofloxacin with moxifloxacin for the treatment of various infections in patients receiving anticoagulation with warfarin. Moxifloxacin does not affect drug metabolism mediated through the cytochrome P450 isozymes. Case reports and case series suggest an interaction exists between moxifloxacin and warfarin, potentially through alterations of intestinal flora and vitamin K synthesis.

METHODS

Patient characteristics and the INRs on days 1 through 9 of concurrent therapy were collected from the electronic medical record. The median INR on day 1 served as the baseline INR. This was then compared to the median INR on days 3 and 5. The analyses were performed in all patients, patients not concurrently receiving another antibiotic aside from moxifloxacin, patients in which there was no change in warfarin, the dose was decreased, or the dose was held, and in patients in which there was no change in warfarin. The Wilcoxon signed rank test was used to statistically test the change in INR.

RESULTS

A statistically significant increase in the median INR to 3 was observed on day three of therapy in all patients, patients receiving moxifloxacin as monotherapy, and in patients in which there was no change in warfarin, the dose was decreased, or the dose was held. The median INR subsequently decreased to 2 by day 5 of therapy in all 3 groups. There was no statistical difference in the INRs at day 3 and day 5 in the patient subgroup in which there was no change in warfarin therapy.

DISCUSSION

Although there was an increase in the median INR in three patient subgroups by day three, the INR decreased by day 5. Moreover in these groups the median INR did not exceed 3, an INR value that is generally considered within the goal therapeutic range for most patients.

CONCLUSION

The increase in INR is transient and likely does not clinically impact the patient. The results of this study do not conflict with the practice of interchanging ciprofloxacin with moxifloxacin in patients receiving warfarin.

Presented at: 2012 ASHP Midyear Clinical Meeting, Las Vegas, NV, 2012. 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, PA, 2013

Harold Kolonich, PharmD

Harold received his PharmD from Duquesne University. After completion of his PGY1 Pharmacy Practice Residency at UPMC Mercy Hospital, Harold will be practicing as a clinical pharmacist.

Faculty Mentors: Dr. Robert Simonelli and Dr. Laura Wilson

Ontology development to identify drug-induced bleeding events

Miller TJ, Saul MI, Kane-Gill SL

PURPOSE

Bleeding is a significant concern when implementing anticoagulant or antiplatelet therapy, especially with novel agents. Data from phase III trials provides an approximation of bleeding events under controlled circumstances, however, "real-world" event rates are often difficult to ascertain and characterize. Post-marketing surveillance helps provide insight into event rates and types; however, the limitations of clinician reporting, namely underreporting, are problematic. An ontology is a formal vocabulary construct composed of concepts and the relationships among those concepts which can be electronically applied for information search and data retrieval. We sought to develop and apply anontology to identify and describe drug-induced bleeding events for patients presenting to the emergency department (ED).

METHODS

Patients presenting to the ED during a one year period at three UPMC hospitals with either a) an ICD-9 code (n=32) for bleeding, b) presence of hemoglobin value ≤ 8 g/dL, or c) were transfused > 2 units of packed red blood cells in the ED were evaluated. De-identified ED reports were manually annotated to confirm drug-induced bleeding events. The reports were separated into those reports with a bleeding event and those reports without a bleeding event documented. Each report was processed using the UMLS to identify all concepts found within the document. The concepts were reviewed by domain experts to identify those which signify a bleeding event and those that do not. These concepts identified by the ontology tool were then used to evaluate a random sample of notes in order to determine the overall sensitivity and specificity of the ontology.

RESULTS

A total of 1716 reports were reviewed, 589 (34.3%) had a suspected drug-induced bleeding event. A total of 292 (49.5%) were identified by ICD-9 code. The types of drug-induced bleeding were epistaxis (n=243, 41.3%), gastrointestinal (n=241, 40.9%), intracranial (n=38, 6.5%) and other (n=67, 11.4%). A bleeding event was discussed in 250 (14.6%) reports but it was unclear if it was drug-induced, and 196 (11.4%) reports indicated a bleeding event but was not drug-induced. The concepts for the ontology application from these reports are currently being identified.

CONCLUSION

It is anticipated that this ontology will aid in the detection of drug-induced bleeding events so that ultimately, the factors associated with bleeding events can be evaluated to enhance the safety of anticoagulant and antiplatelet therapies.

Taylor Miller, PharmD

Taylor received his PharmD from the University of Pittsburgh in 2011, and subsequently completed his PGY-1 pharmacy residency at UPMC Mercy followed by his PGY-2 cardiology pharmacy residency this year at UPMC Presbyterian. Taylor's interests within pharmacy practice include the critical care management of patients with heart failure and acute coronary syndrome, and his future plans include direct patient care within that scope of practice.

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

Students' Perception of Learning Preference as Compared to Two Learning Style Assessments

Millisor VE, Pater KS

PURPOSE

The four classifications of learners according to the Kolb Learning Style Inventory (LSI) are divergers, assimilators, convergers, and accommodators. The VARK instrument categorizes learners' preferences as visual, auditory, reading-writing, or kinesthetic. Although the learning styles of pharmacy students have been assessed, little research has been done to evaluate the relationship between instructional design of learning materials and learning preferences. We expand on recent studies of learning preferences by evaluating the results of two learning style assessments and student reported preference for learning. Outcomes in an introduction to self-care course incorporating multiple teaching methods will also be reviewed.

METHODS

A learning style survey was administered to students enrolled in the Profession Of Pharmacy 2 PHARM5111 course. The learning cycle of experiential learning and multiple sensory stimuli for learning were incorporated in to the design of a 3-hour practicum. Students participated in 1 hour of lecture and 2 hours of small group focused activities at six different stations.

RESULTS

Using the KOLB LSI, students were found to be accommodators (31%), divergers (31%), convergers (24%) and assimilators (14%). According to the VARK assessment students were found to be V (3%), A (1%), R (20%), K (3%) and multimodal (73%). The class average on pre-, post- and retention quizzes were 41.59%, 83.41% and 57.79%, respectively. Using a repeated measure design, a significant difference was noted between pre-post and retention scores overall.

CONCLUSION

There was no predominant learning style identified using the KOLB Learning Style Inventory and according to the VARK assessment, most students were found to be multimodal or have dominance in reading-writing learning style.

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2013.

Vanessa E. Millisor, Pharm.D.

Vanessa Millisor received her Pharm.D. from the South Carolina College of Pharmacy in 2012. Vanessa has a passion for oncology, infectious disease, medication safety and global health. Outside of residency, Vanessa enjoys painting, reading, traveling and spending time outdoors with her Siberian Husky, Nanook. After the completion of PGY1 Pharmacy Residency, Vanessa will complete PGY2 training in pediatric oncology at the St. Jude Children's Research Hospital in Memphis, Tennessee.

Faculty Mentors: Karen S. Pater, Pharm.D., BCPS, CDE, Sandra L. Kane-Gill, Pharm.D., MS, FCCM, FCCP, Amy L. Seybert, Pharm.D., Sharon E. Connor, Pharm.D. and Lauren Jonkman, Pharm.D., MPH, BCPS

Common Occurrence of Ceftriaxone-Resistant (CXT-R) MSSA at a University Teaching Hospital

Pickering A, Hariri R, Harrison L, Marsh J, Tasneem A, Freedy A, Wilson A, Bonilla H

PURPOSE

Ceftriaxone (CTX) is a 3rd generation cephalosporin thought to have activity against methicillin-sensitive *Staphylococcus aureus* (MSSA). CTX-R MSSA has been reported in <3% of cases. In a previous study at our institution, 34% of MSSA isolates were CTX-R. In 2012, CLSI recommended eliminating all β-lactam antibiotic breakpoints except oxacillin, cefoxitin, penicillin, and ceftaroline and suggested that activity for other β-lactams against MSSA can be predicted using these agents.

METHODS

We performed a retrospective study, in patients with MSSA bacteremia from Jan. 2012 to Feb. 2013. Strains susceptible to CTX (MIC ≤ 8μg/ml) and CTX-R strains (MIC > 32μg/ml) were included. Demographic characteristics, clinical presentation and outcomes, laboratory values, management, and mortality data were collected. Antimicrobial susceptibility for cefazolin, cefuroxime, cefepime, and ceftaroline using disc diffusion and E-test methodologies and pulsed field gel electrophoresis (PFGE) were performed on 8 CTX-R and 8 CTX-S isolates.

RESULTS

Sixty-three MSSA isolates from blood underwent CTX susceptibility testing. Eight isolates were determined to be sensitive to CTX, 17 were intermediate, and 38 were resistant. No significant differences were found in demographics, co-morbidities, clinical presentation or outcomes. However, patients with CTX-R MSSA had greater leukocytosis than those patients with CTX-S MSSA (median of 14,800 cells/uL vs 10,200 cells/uL respectively, p=0.025). None of the 16 isolates sent for additional testing were resistant to other tested cephalosporins. PFGE revealed 4 related clones between CTX-S and CTX-R isolates, but no predominant clone within the CTX-S or CTX-R strains.

CONCLUSION

The prevalence of CTX-R in MSSA may be greater than reported in the literature. CTX activity cannot be predicted using other β-lactam antibiotics as surrogates. Further studies are warranted to determine the clinical implications of this finding, how widespread CTX resistance is in MSSA, and the molecular mechanisms of resistance

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2009.

Aaron J. Pickering, PharmD

Aaron received his PharmD from Duquesne University Mylan School of Pharmacy in 2006. After the completion of the PGY1 Pharmacy Residency, Aaron will continue at UPMC Presbyterian to complete a PGY2 Infectious Diseases Residency.

Faculty Mentors: Henry Freedy, PharmD, Hector Bonilla, MD

Development of an Electronic Screening Tool to Identify Potential Adverse Drug Events within an ICU Discharge Summary

Politz TR, Kloet MA, Miller T, Anthes A, Saul MI, Smithburger PL, Kane-Gill SL.

PURPOSE

More than one million preventable adverse drug events (ADEs) are estimated to occur each year in the United States. This opportunity for prevention emphasizes the importance of ADE surveillance and the need to evaluate these data so that the severity and occurrence of future events can be reduced. A previous study completed at our institution used ICU discharge summaries to identify ICU-specific ADEs demonstrating a benefit of a targeted chart review for surveillance in this patient population. Unfortunately a manual approach for ADE identification was used which was resource intensive. In this study, we aim to automate the ADE identification process in the ICU discharge summary using natural language processing to classify key words and concepts surrounding ADEs. The ultimate goal is to develop an electronic screening tool to simplify the process and improve surveillance.

METHODS

This study is being conducted in a 2 stage process: 1) identification of words and phrases associated with ADEs noted in an ICU discharge summary and 2) utilization of the aforementioned words and phrases by means of natural language processing to identify ADEs. Stage 1: A retrospective chart review of patients admitted to the MICU with discharge dates from January 1, 2012 to April 30, 2012 and with a MICU length of stay >24 hours were included. Discharge summaries, defined as the notes on the last day of the ICU stay, were reviewed for the presence of an ADE by 2 independent pharmacist reviewers. A third pharmacist resolved any discrepancies between the two reviewers. The primary outcome of this evaluation is the trigger words and phrases collected by the reviewers when an ADE was identified. Inter-rater reliability was calculated for the 2 reviewers. The amount of pharmacist time required for manual review of each discharge summary was assessed as a secondary outcome to compare with data from stage 2.

RESULTS (PENDING)

A cohort of 380 unique patient visits has been identified that includes 1502 progress notes. A total of 30 patients and 126 reports have been reviewed to date. The most common ADEs identified include bleeding (n=8) and hypoglycemia (n=4).

CONCLUSIONS

An electronic tool to identify ADEs will increase reporting in institutions allowing for aggregate analysis of events promoting systematic changes and prevention of future events.

Tiffany Politz, PharmD, BCPS

Tiffany received her BS in Biology and in Pharmaceutical Sciences from South Dakota State University in 2009 followed by her PharmD in 2011. She completed her PGY1 pharmacy residency training at NorthShore University HealthSystem in Highland Park, IL. After completing her PGY2 residency in Medication Use Safety, Tiffany plans to pursue a position involving medication safety that would ideally include direct patient care as well as an operational component at a healthcare system.

Faculty Mentors: Sandra Kane-Gill, PharmD, MSc, FCCM, FCCP and Pamela Smithburger, PharmD, BCPS

Evaluation of Provider Usage of Select Drug Levels at UPMC St. Margaret Hospital

Sacha LM, Campbell RJ

PURPOSE

Therapeutic drug monitoring is a useful method of evaluating safety and efficacy of drug therapy for a relatively small number of medications (e.g. digoxin, phenytoin, vancomycin). However, there are a variety of other drugs for which drug levels may be obtained, despite the lack of evidence for reliable use of these drug levels in management of therapy. Furthermore, these drug levels must be sent to an outside laboratory for processing, increasing their turnaround time. The objective of this study is to evaluate whether or not send-out drug levels are being utilized by providers in managing patients' drug therapy.

METHODS

A retrospective chart review was completed of patients who were ordered one or more send-out drug levels while admitted to UPMC St. Margaret Hospital between July 1, 2011 and June 30, 2012. Data were collected for type of drug level, length of stay, ordering provider and service, time to result of drug level, and changes in drug dose or drug discontinuation.

RESULTS

A total of 251 individual tests were ordered during the study period. The mean time to result for all send-out drug levels was 90.5 hours. Total patient charges for all drug levels ordered amounted to $57,941. Out of 49 changes to therapy made, only seven were made after the drug level result had been reported.

CONCLUSIONS

Based on the current state of ordering of these send-out drug levels at St. Margaret, the majority of these tests are not being used to influence clinical management of patients. This is the result of the limited clinical utility and extended laboratory turnaround time of these drug levels. Additionally, patients incurred significant costs associated with these tests. These types of drug levels may require ordering restrictions in order to limit over-utilization of laboratory resources and excess costs to the hospital's patients.

Lauren M. Sacha, PharmD

Lauren is a Buffalo, N.Y. native who received her PharmD from the Wegmans School of Pharmacy at St. John Fisher College. Upon completion of her PGY1 Pharmacy Practice Residency, she will continue at the University of Pittsburgh Medical Center to complete a PGY2 Solid Organ Transplant Residency. Outside of pharmacy, Lauren enjoys all things food-related.

Faculty Mentors: Trish Klatt, PharmD, BCPS and Ron Campbell, PharmD, BCPS

Evaluation of the Financial and Clinical Effects of a Quantity Limit on Oral Buprenorphine Agents

Saunders J, Hain J, Patel A, Coley K, Daw J

PURPOSE

Oral buprenorphine agents (Suboxone®, Subutex®) have the potential for inappropriate use, abuse, and diversion. Guidelines recommend a daily target dose of ≤16mg buprenorphine. UPMC Health Plan implemented a quantity limit (QL) of 60 tablets/films per 30 days (max 16mg buprenorphine daily) for Commercial and Medicaid members effective 2/1/2012. This study evaluated the effect of the quantity limit on overall dose specific utilization, attempts to fill an opioid, and associated pharmacy and medical costs.

METHODS

A retrospective claims analysis was conducted including Commercial and Medicaid members continuously enrolled between 6/1/2011 and 12/31/2012 with ≥ 1 paid claim for an oral buprenorphine agent from 9/1/2011 through 1/31/2012. The study assessed the change in average daily dose of oral buprenorphine utilized and the percent of members attempting to fill an opioid. A cost analysis compared the change in oral buprenorphine pharmacy spend per member per month (PMPM), overall medical spend, and medical spend with a primary or any level diagnosis of opioid dependence.

RESULTS

The study population included 1456 members, of which 1122 had a paid claim both pre and post-QL. There was a significant increase in the percent of members using an average daily dose of ≤16mg and a significant decrease in the percent using >16 mg (n=1122, $p<0.01$). There was no significant change in members attempting to fill an opioid (n=1122). The median PMPM oral buprenorphine pharmacy spend significantly decreased from $300 to $219 (n=1456, $p<0.01$). The median medical spend PMPM for the Commercial product (n=346) did not change significantly.

CONCLUSION

A significant reduction was observed in oral buprenorphine pharmacy spend and average daily buprenorphine dose with a shift in utilization toward the recommended target dose of ≤ 16mg daily. Additionally, there was no negative impact on the percent of members attempting to fill an opioid or on medical spend.

Presented at the Academy of Managed Care Pharmacy 25th Annual Meeting, San Diego, Calif., April 2013.

Jessica M. Saunders, PharmD

Jessica received her PharmD from Hampton University School of Pharmacy in Hampton, VA. After the completion of her PGY1 managed care pharmacy residency at UPMC Health Plan in June 2013, Jessica plans to pursue a career in managed care.

Faculty Mentors: Jocelyn Hain, PharmD; Amy Patel, PharmD

Blending Simulation to Facilitate Learning in an Advanced Pharmacy Therapeutics Course

Schwier NC, Benedict NJ, Seybert AL

PURPOSE

This study compared satisfaction and learning for students randomized to virtual patient simulation case and high-fidelity mannequin model simulation (blended simulation), versus mannequin model simulation alone

METHODS

This was a prospective, single blinded, randomized, controlled study at the University of Pittsburgh School of Pharmacy, involving 107 second professional year PharmD students. Students were randomized to either a blended simulation experience or high-fidelity mannequin model simulation alone. Baseline knowledge evaluations were completed by all students immediately prior to the mannequin model simulation. A standardized rubric was used by course faculty to evaluate student learning following the mannequin experience. Effectiveness was evaluated by comparing baseline evaluations of the "control" group (mannequin simulation alone) to the corresponding scores of the "intervention" group (blended simulation). Application of knowledge was evaluated through the faculty graded rubrics. Student perceptions and satisfaction were collected by surveys administered upon completion of the assessment.

RESULTS

Students found the blended simulation intellectually challenging (100%), stimulated their interest in course content (72%), and should be further incorporated into the curriculum (96.5%). Mean baseline knowledge evaluation scores for the blended simulation group were 4.14/5 compared to 2.83/5 in the mannequin only group; mean standardized rubric scores for the blended group were 78.1% compared to 75.6% in the mannequin only group.

CONCLUSIONS

Students found the blended learning simulation experience to be challenging, applicable, and useful, and that blended simulations should be further incorporated into the curriculum. Students randomized to the virtual patient had a higher baseline understanding of course content, as indicated by baseline knowledge evaluations.

Presented at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors. Hershey, Pennsylvania, 2013

Nicholas C. Schwier, Pharm.D.

Nicholas received his Pharm.D. from the Wegmans School of Pharmacy at St. John Fisher College, in Rochester, NY. After completing his PGY-1, Nicholas will continue his training at the University of Pittsburgh Medical Center, as a PGY-2 Cardiology Pharmacy Resident. After his training, Nicholas hopes to obtain a faculty position at a School of Pharmacy.

Faculty Mentors: Neal J. Benedict, Pharm.D. and Amy L. Seybert, Pharm.D., FASHP, FCCP

Empowering Pharmacy Students to Better Care for Older Adults

Seaton SM, Marcum ZA, Ruby CM

OBJECTIVES

To determine the effect of implementing geriatrics-focused teaching methods on 1) student-perceived attitudes toward older adults and 2) student-perceived level of achievement on course abilities.

METHODS

All second-year (P2) students at the University of Pittsburgh School of Pharmacy were enrolled. Specific geriatrics didactic content was developed and delivered before two planned experiential sessions with older adults at community centers. Student attitudes were measured with the validated 14-item Geriatrics Attitudes Survey (pre/post). Self-assessed course abilities (pre/post) were measured by a scale developed for this study. Change scores were calculated for each student and Wilcoxon signed rank tests were used to determine the level of statistical significance among the paired samples.

RESULTS

A total of 106 P2's (mean age 21.5 years, 65% female, and 79% Caucasian) completed both the pre- and post-surveys. While 2/14 items on the Geriatrics Attitudes Survey showed a significant change, all 9 items on the self-perceived course ability scale significantly improved. Improvement was reported in 54 (49.5%) and 78 (71.6%) of P2's attitudes and self-perceived course ability scales, respectively. In univariate analyses, a positive improvement in attitudes was associated with being married and having ≥3 contact hours per week with older adults at a pharmacy intern location. Improvement in course abilities was associated with female sex and pharmacy intern location ($p<0.05$).

CONCLUSIONS

Implementation of geriatrics care-focused teaching methods had an overall positive effect on the students' attitudes and achievement in course abilities.

Presented at the 7th Annual Aging Institute Research Day (received 1st Place in poster presentation for the "Clinical Practitioner Category for Quality or Practice Improvement") Pittsburgh, Pennsylvania

Abstract has been accepted for poster presentation at the American Association of Colleges of Pharmacy (AACP) Annual Meeting held July 13-17, 2013 Chicago, Illinois

Stephanie M. Seaton, Pharm.D.

Stephanie received her Pharm.D. from St. Louis College of Pharmacy in Saint Louis, Missouri in 2011. She completed her PGY1 in Pharmacy Residency at UPMC Presbyterian in 2012 and is currently completing her PGY2 in Geriatric Pharmacy with UPMC Presbyterian-Shadyside. This fall, Stephanie will join the faculty ranks at St. Louis College of Pharmacy as an Assistant Professor of Pharmacy Practice and provide clinical pharmacy services in ambulatory care and geriatrics. She plans to become board certified in ambulatory care (BCACP) and certified geriatric pharmacist (CGP).

Faculty Mentors: Christine M. Ruby, Pharm.D., BCPS, FASCP, and Zachary A. Marcum, Pharm.D., MS, BCPS,

Evaluation of nursing education on heparin protocol compliance

Shigle TL, Wilson G, Wilson L

PURPOSE

Heparin is a high-alert medication and associated errors may result in patient harm. Our institution created a multidisciplinary team to review hospital-wide IV heparin administration procedures and to implement changes in education and procedures to improve patient safety. The objective of this study is to evaluate the effectiveness of these changes in regards to compliance with IV heparin protocols.

METHODS

The institution's electronic medical record system was used to identify patients who received IV heparin therapy during March 2012 and from November 26, 2012 to January 6, 2013 to assess monitoring and compliance after changes to education and procedures were implemented. Patients receiving titratable IV heparin were included in the study. Patients under the age of 18, receiving heparin via a route other than continuous IV infusion, receiving fix-dosed IV heparin, or who underwent CABG procedure were excluded from the study. The primary outcome was to evaluate nurses' compliance with four protocol-specified actions including: the measurement of baseline aPTT, aPTT post-infusion initiation, aPTT post-dose adjustment and protocol-specified dose adjustments in response to out of range aPTT. Secondary outcomes included time to therapeutic aPTT, percentage of therapeutic aPTTs, and occurrence of bleeding or thromboembolic event.

RESULTS

A total of 135 patients were analyzed, 49 in the pre-education group and 86 in the post-education group. There was an improvement in all primary endpoints, but there was a statistically significant change after education with appropriate dosage adjustment based on protocol (53.3% vs. 75.6%; p=0.019) and aPTT post-dose adjustment (25% vs. 45.2%; p=0.034). There were no differences after education in the secondary outcomes.

CONCLUSION

Nursing re-education helped to improve compliance with some primary endpoints, however there needs to be a change to how the IV heparin infusion protocol is executed in order to increase effectiveness and safety.

Presented: The 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors Hershey, Pa 2013

Terri Lynn Shigle, PharmD

Terri Lynn received a dual degree in biology and pharmacy from Ohio Northern University. After completion of her PGY1 Pharmacy Practice Residency at UPMC Mercy Hospital, Terri Lynn will continue at UPMC Shadyside Hospital as the PGY2 Oncology resident.

Faculty Mentors: Greg Wilson, PharmD, BCPS and Laura Wilson, PharmD, BCPS

Teratogens in a family health center: Exposure, contraception, counseling, and documentation

Simpson AR, Ballard SL, Owens NW

PURPOSE

Pregnancies in women prescribed FDA pregnancy category D and X teratogenic medications put both mother and fetus at risk. The objective of this study is to quantify the prevalence of teratogen prescribing in women of childbearing age with inadequate contraceptive planning in an urban family health center. Identifying factors that made counseling and documentation more or less likely to occur will aid in the development of further quality-improvement projects in this area.

METHODS

A chart review was conducted for encounters from June 2012 – November 2012 for women ages 12 – 45 years that resulted in the addition of a teratogenic medication to the profile. The primary outcome was the percentage of women exposed to a teratogen without documentation of a contraceptive plan. Secondary outcomes included descriptive statistics regarding teratogenic medications prescribed, contraceptive methods documented, and relevant demographic and encounter information. Data will also be analyzed using multivariate logistic regression to identify associations that increased or decreased the likelihood of documentation.

RESULTS

A total of 244 encounters were identified and 212 were included for chart review, with 32 excluded as non-chronic prescriptions. Of these encounters 90 (58%) were identified as having no documented method of contraception anywhere in the chart. Only 46 (22%) encounters defined a contraceptive plan in the encounter note and less than 4 (2%) documented a discussion of potential teratogenicity.

CONCLUSIONS

Analysis of this data is ongoing but preliminary results have shown that counseling and documentation of contraception and teratogenic risk was similar to that seen in prior studies. The pharmacy team at the health center is committed to supporting further interventions to address this issue. For pharmacists, this study highlights the need to initiate conversations surrounding contraception and teratogens with our patients.

Presented at the 2013 Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, PA.

Amanda R Simpson, PharmD

Amanda received her PharmD from the University of Pittsburgh School of Pharmacy. Outside of residency, Amanda enjoys spending time with her family and running. After the completion of the PGY1 Pharmacy Residency at UPMC Shadyside, Amanda will continue on with UPMC as a Unit-based Clinical Pharmacist in General Medicine at UPMC Presbyterian.

Faculty Mentors: Stephanie Ballard, PharmD BCPS, Nicholas Owens, PharmD BCPS, Megan Coldren, PharmD

Evaluating the UPMC St. Margaret COPD Free Medication Program for Effect on 30-day Readmission Rate

Sisco KM, Broders JK

PURPOSE

In an effort to better care for COPD patients, UPMC St. Margaret instituted the COPD Task Force, which closely addressed this patient population's needs. Through this task force, it was identified that patients were having difficulties affording their medications and thus returning to the hospital for further care. The UPMC St. Margaret COPD Free Medication Program was funded in order to meet this need. The primary objective of this investigation is to evaluate the COPD Free Medication Program for its effect on 30-day hospital readmissions. Secondary objectives are to identify the cost-effectiveness of the program and describe patient characteristics.

METHODS

A retrospective chart review was conducted from October 2012 through April 2013. Patients recently discharged from UPMC St. Margaret with a primary diagnosis of COPD exacerbation that received education from the COPD Task Force nurse and needed assistance with their medications were included. Thirty-day readmission rates were compared between patients who received inhalers and those that did not, regardless of additional education received.

RESULTS

A total of 18 inhalers were dispensed to 11 patients. A 30-day readmission rate of 9.1% was observed for those patients who received inhalers and a rate of 13.9% for those who did not. This difference was not statistically significant ($p = 0.55$, CI 6%-21%). Average time from discharge to Task Force follow-up and to receipt of inhaler was 9.6 days (range 3-24 days) and 17.7 days (range 5 – 29 days), respectively.

CONCLUSION

Provision of free COPD inhalers after admission for a COPD exacerbation in combination with the COPD Task Force resulted in a non-statistically significant reduction in 30-day readmission rates at UPMC St. Margaret. Moving forward, patients will be assessed for inclusion in this program prior to discharge in an attempt to provide inhalers to a larger number of patients and decrease time to receipt of free inhalers.

Presented at the Society of Teachers in Family Medicine 46th Annual Spring Conference, Baltimore, MD, 2013 and the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, PA, 2013.

Kate M Sisco, PharmD

Kate received her PharmD from the University of Pittsburgh School of Pharmacy in 2012. After completion of the PGY-1 Pharmacy Practice Residency at UPMC St. Margaret hospital, she is pursing positions as a clinical pharmacist and hopes to continue to work closely with the community both locally and abroad. Outside of pharmacy, Kate enjoys travelling, live music, and the works of Kurt Vonnegut.

Faculty Mentors: Jennie Broders, PharmD BCPS, Trish Klatt, PharmD BCPS

Molecular and phenotypic characteristics of KPC-Kp strains are associated with clinical outcomes among transplant recipients with bacteremia

Smith MA[1], Press EG[2], Clancy CJ[2, 3], Nguyen MH[2], Shields RK[2]

University of Pittsburgh, Department of Pharmacy and Therapeutics[1], Department of Medicine[2], and VA Pittsburgh Healthcare System[3], Pittsburgh, PA, USA

PURPOSE

Klebsiella pneumoniae carbapenemase (KPC) producing organisms have emerged as a global healthcare crisis. We reported highly variable outcomes among solid-organ transplant (SOT) patients (pts) with KPC-producing *Klebsiella pneumoniae* (KPC-Kp) bacteremia. The objective of this study was to characterize pt responses using a clinical and molecular approach.

METHODS

SOT pts with KPC-Kp bacteremia were identified through a retrospective study. The primary outcome was clinical response at 14 days. Outcomes were defined as clinical success (microbiologic eradication), recurrent/persistent bacteremia, and death. KPC-Kp isolates were collected from each pt and characterized *in vitro.*

RESULTS

27 SOT pts were included. 52% (14), 30% (8), 11% (3), and 7% (2) were liver, intestine/multivisceral, lung, and kidney transplant recipients, respectively. 15% (4) died within 7 days of the onset of bacteremia. Among pts who survived, 52% (12) and 48% (11) had recurrent/persistent bacteremia and clinical success, respectively. Underlying diseases, source of bacteremia, APACHE II scores (median: 18, range: 4 – 32), and antimicrobial regimens did not vary between groups.

All isolates were bla-*kpc* (+). 85% (23) and 15% (4) were KPC subtype 2 and 3, respectively. Doripenem MICs did not correlate with clinical outcome (median: 64 µg/mL, range: 4 - 128 µg/mL). Colistin and tigecyline MICs were lower among pts who died (p=0.02 and 0.06, respectively). 70% (19) of isolates exhibited a typical mucoid phenotype and 26% (7) were hypermucoid. One isolate displayed an extremely viscous phenotype. Hypermucoid strains were more common among pts with recurrent/persistent (50% vs. 7%; p=0.02) and in KPC-3 versus KPC-2 (75% vs. 17%; p=0.04). Mean growth rates (hr^{-1}) were 2.62, 1.83, and 1.61 in isolates associated with death, recurrent/persistent, and clinical success, respectively. Isolates from pts who died grew more rapidly than other strains (mean 2.62hr^{-1} vs. 1.72hr^{-1}; p=0.03). Growth rates did not vary by phenotype.

CONCLUSIONS

Outcomes of KPC-Kp bacteremia among SOT pts are highly variable and may be associated with molecular and phenotypic characteristics of infecting isolates.

Submitted to Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC), 2013.

Michael A Smith, PharmD, BCPS

Michael received both his BS and PharmD from the University of Pittsburgh. He went on to complete a PGY1 Pharmacy Residency at the University of Pittsburgh Medical Center. After completion of a PGY2 Internal Medicine Residency, Michael will join the faculty at the University of the Sciences in Philadelphia as an Assistant Professor of Clinical Pharmacy.

Faculty Mentors: Ryan Shields, PharmD, Rima Mohammad, PharmD, BCPS, and Neal Benedict, PharmD

Perceptions of Pharmacy Benefit Manager (PBM)-Based Medication Therapy Management Services and Incentives for Participation

Stevens BM, Markuss JJ, Tracy CJ

PURPOSE

As the Centers for Medicare & Medicaid Services (CMS) ratings place emphasis on medication therapy management (MTM) participation, identifying strategies to increase participation will be important to plan sponsors. The study was conducted to determine members' perceptions of PBM-based MTM services and whether the potential for incentives could affect members' interest in participating.

METHODS

A self-administered questionnaire was mailed to 4,724 continuously-enrolled adult Medicare Part-D members of a Southeastern-U.S. health plan. Inclusion criteria were (1) members filling ≥ 8 chronic medications, (2) having ≥ 3 chronic disease states, and (3) drug spend of ≥ $775 during a single quarter. The survey assessed perceptions of the helpfulness of MTM pharmacists, potential to participate in MTM with incentives, willingness to participate based on recommendation source, and comfort level in sharing personal health information. Survey responses were ranked on a 5-point Likert scale.

RESULTS

There were 323 members who returned surveys by February 12, 2013. Generally, members had positive perceptions of MTM services with mean Likert scores of greater than 3. There were no significant differences in willingness to participate in MTM with incentives. Members age 18-64 were more likely to have positive opinions of participating at no cost compared to members ≥ age 65 ($p < 0.001$). Members were generally comfortable in sharing personal health information with MTM pharmacists, and members age 18-64 had more positive perceptions of sharing information compared to those ≥ age 65 ($p = 0.001$). Members were significantly more likely to desire to participate in MTM when it was recommended by a physician compared to family members, friends, health plans, or employers ($p < 0.001$).

CONCLUSIONS

Many members have positive perceptions of the value of MTM services and incentives do not influence willingness to participate. Physician recommendation appears to have the greatest influence on members' propensity to participate in MTM.

Presented at the 25th Annual Academy of Managed Care Pharmacy Meeting & Expo, San Diego, CA., 2013.

Brad M. Stevens, PharmD

Brad received his PharmD from the University of Pittsburgh School of Pharmacy. He has gained valuable experiences in managed care pharmacy during his PGY 1 managed care residency at CVS Caremark. In addition to the residency, Brad enjoys playing hockey and attending Pitt football and basketball games.

Research Mentors: Jason Markuss, PharmD, MS; Kim Coley, PharmD, FCCP

Smooth Transitions:
The workflow of two clinical pharmacists across the continuum of geriatric care

Thompson, JM, Sakely, H, D'Amico, F

PURPOSE
The objective of the current study is to describe a new and unique practice model in which two clinical pharmacists provide direct patient care in concert with a multidisciplinary healthcare team across the continuum of geriatric care. The multidisciplinary team provides care for patients from the Presbyterian SeniorCare – Oakmont senior living community, the outpatient physician practices of the Geriatric Care Centers- St. Margaret and Oakmont campuses and the UPMC St. Margaret's inpatient geriatric service. The analysis will provide a replicable, transferable, and sustainable model, allowing others to more easily incorporate clinical pharmacists into similar practice environments.

METHODS
A direct, observational, mixed-methods workflow analysis was performed to describe frequency and time of daily activities. Observations were performed by a single investigator following two pharmacists at each location over a 3 month period until saturation was reached.

RESULTS
Saturation was reached after 35.8 hours. Observations were categorized into seven predominant activities. Communication, chart review, data gathering and patient interviews were the most frequent activities. Communication between patients and other providers accounted for 46.4% of the total observations. Average time per activity was 5.0 and 5.5 minutes for pharmacist 1 and pharmacist 2 respectively. Themes for effective practice were identified and a diagram of the daily activities performed by the pharmacists was created.

CONCLUSION
A clinical pharmacist incorporated into a geriatric care team holds a number of responsibilities and performs many unique and important tasks. The workflow analysis depicts frequency and time spent caring out activities performed by a clinical pharmacist as patients' transition between healthcare settings and allows other practitioners to clearly understand the role a pharmacist can play.

Presented:

Oral "Works in Progress" presentation: Society of Teachers of Family Medicine Annual Meeting Baltimore, Maryland (May 2013)

Poster Presentation: 2013 Annual Scientific Meeting of the American Geriatrics Society Grapevine, Texas (May 2013)

Annual Eastern States Conference for Pharmacy Residents and Preceptors Hershey, Pennsylvania (May 2013)

Johanna M. Thompson, PharmD, BS

Johanna received her undergraduate degree from Hillsdale College in Michigan and her PharmD from the University of Washington School of Pharmacy. When away from the hospital, Johanna enjoys spending time exploring the outdoors, running, and traveling. After the completion of her PGY1 Pharmacy Residency, Johanna will head west for a PGY2 Family Medicine Residency at the University of Utah.

Faculty Mentors: Heather Sakely, PharmD, BCPS, Tiffany Chen, PharmD, BCPS

Evaluation of Outcomes after a Quality Improvement Study on Dosing and Monitoring of Vancomycin

Winter SE, D'Amico F, Gingo LL

PURPOSE

At UPMC St. Margaret Hospital, the Department of Pharmacy is responsible for dosing, monitoring and making appropriate adjustment to vancomycin therapy. Results from a previous evaluation of this service demonstrated the majority of patients were subtherapeutic at first trough. A new dosing protocol was created and approved by the Pharmacy and Therapeutics Committee. The objective of this study is to evaluate the new dosing protocol for the pharmacokinetic service to ensure there is an improvement in patient care.

METHODS

A retrospective, QA-QI approved study of the pharmacokinetic service was performed. Hemodialysis and acute kidney injury patients were excluded. The primary outcome is to evaluate the change in prevalence of the new vancomycin dosing protocol achieving target trough. The secondary outcome is to assess compliance to the new protocol and to identify any patients who develop acute kidney injury due to the vancomycin therapy. A priori power analysis showed at least 230 patients would provide a 90% power for detecting a difference of 0.15 in the prevalence of subtherapeutic trough levels (alpha <0.05).

RESULTS

Eligible patients (n=239) were treated according to a standardized pharmacokinetics protocol. At first trough, 33.0% (79) (95% confidence interval (CI) 27.2%-39.0%) were subtherapeutic, 42.7% (102) (95% CI 6.2%-15.0%) were therapeutic, 24.3% (58) (95% CI 18.9%-29.7%) were supratherapeutic. There was a significant reduction ($p<0.025$) in subtherapeutic trough levels compared to the original protocol which was 54% (95% CI 45%-59.2%). There was 86% compliance with the dosing frequency. Sixteen patients developed nephrotoxicity, 11 of those patients received a concomitant nephrotoxic agent or were assessed by nephrology and considered to have an additional compelling cause for acute kidney injury.

CONCLUSION

Since the implementation of the new dosing protocol, the number of patients subtherapeutic at first trough has decreased. Overall, there was a low incidence of nephrotoxicity.

Sarah E Winter, PharmD

Sarah received her PharmD from the Duquesne University Mylan School of Pharmacy in 2011. After completion of her PGY2 Family Medicine Pharmacy Recidency at UPMC St. Margaret, Sarah plans to pursue a career at an academic medical center where she hopes to balance teaching and clinical work. Outside of pharmacy, Sarah enjoys painting, traveling, and spending time with friends and family.

Faculty Mentor: Leslie Gingo, PharmD, BCPS

Pharmacist Initiated Transitions of Care Program: Effect on Hospital Readmission and Adherence to Follow-Up PCP Appointments

Wojtusik A, Broders J, D'Amico F

PURPOSE

Medication discrepancies following hospital discharge can result in costly hospital readmissions. In effort to minimize these medication discrepancies, UPMC St. Margaret and its three affiliated family health centers (FHCs) began a Transitions of Care Initiative in March 2012. Clinical outpatient pharmacists contacted patients via telephone within four days following discharge. During each telephone encounter pharmacists reinforced discharge plans, reconciled pre- and post-hospitalization medications, updated outpatient medication records, and emphasized the need for prompt follow-up with a primary care provider (PCP). Our objective was to evaluate the UPMC St. Margaret FHC Transitions of Care Initiative and its impact on 30-day readmission rates and PCP follow-up.

METHODS

This retrospective chart review included all adults (≥18) discharged from the UPMC St. Margaret inpatient FHC service between March 2012 and December 2012. Patients were excluded if they had not followed at one of the three UPMC St. Margaret FHCs within the previous two years, died during the index hospitalization, were transferred to another hospital, or were discharged to a skilled nursing facility (SNF), other medical living facility, or a hospice service. Patients who received a post-discharge telephone call were identified using the inpatient and outpatient electronic health records (EHRs). Thirty-day readmission rates and PCP follow-up were compared between patients who received a post-discharge telephone call and patients who did not.

RESULTS

Of patients who received a telephone call, 53% followed-up with a PCP within 7 days after discharge compared to 51% of patients who did not receive a telephone call (p=0.39). The 30-day readmission rate for patients who received a telephone call was 12% compared to 21% in patients who did not receive a telephone call (p=0.05).

CONCLUSIONS

Although there is room for improvement, the UPMC St. Margaret FHC Transitions of Care Initiative is an effective model for care coordination following hospital discharge.

Presented at the 46th Annual Society of Teachers of Family Medicine (STFM) Spring Conference, Baltimore, MD., 2013.

Poster presentation at the 32nd Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2013.

Amanda Wojtusik, PharmD

Amanda received her PharmD from the University of Rhode Island College of Pharmacy. After the completion of her PGY1 Pharmacy Practice Residency, Amanda will continue at UPMC St. Margaret to complete a PGY2 Family Medicine Residency. She eventually plans to attain an academic faculty position. In her free time Amanda enjoys running, reading, and experiencing all of the adventures Pittsburgh has to offer.

Faculty Mentor: Jennie Broders, PharmD, BCPS

Management and impact of bleeding events with dabigatran, rivaroxaban, and warfarin

Yarabinec DM, Hall DL, Coons JC

PURPOSE

Compared to warfarin, patients who bleed on dabigatran or rivaroxaban may be more difficult to manage since no specific reversal agents have been identified. The purpose of this project was to compare the reversal strategies used to manage bleeding events in patients on dabigatran, rivaroxaban, or warfarin, and assess the impact of bleeding events on healthcare utilization in these patients.

METHODS

We designed a retrospective cohort review of patients who presented to the Emergency Department or were directly admitted to UPMC Presbyterian or UPMC Shadyside between October 19, 2010-September 30, 2012 for bleeding, verified by ICD9 code. Additional inclusion criteria consisted of: use of any of the three medications prior to arrival; diagnosis of atrial fibrillation; and charges during admission for bleeding management strategies of interest (including frozen plasma (FFP), recombinant human factor VIIa (rFVIIa), prothrombin complex concentrate (PCC), activated PCCs (aPCC), vitamin K, activated charcoal, and dialysis). Healthcare resources examined include hospital length of stay (LOS) and blood transfusions. Economic impact will be analyzed using patients' aggregate hospital charges.

RESULTS

Of 14,980 patients in the date range admitted for bleeding, we identified 600 patients that met the other inclusion criteria (dabigatran n=14, rivaroxaban n=2, warfarin n=584). Preliminary results indicate primarily major bleeds in patients taking dabigatran and rivaroxaban. Dabigatran patients were an average age of 73 years and had an average LOS of 21 days; rivaroxaban patients were an average age of 73 years and had an average LOS of 34 days. Full results will be presented.

CONCLUSIONS

We expect this study to provide some evidence for potential trends and health care impact of bleeding reversal strategies for patients on dabigatran and rivaroxaban, particularly in comparison to warfarin. We will provide the data to the health-system to help standardize the treatment approach to these patients.

Presented at American Association of Pharmaceutical Sciences (AAPS) Joint Symposium, Pittsburgh, Pennsylvania, November 2012; 47th American Society of Health-System Pharmacists (ASHP) Midyear Clinical Meeting, Las Vegas, Nevada, December 2012; 32nd Annual Eastern States Conference, Hershey, Pennsylvania, May 2013.

Daniel M Yarabinec, PharmD

Dan is originally from Sharpsville, Pa. and received his PharmD from the University of Pittsburgh School of Pharmacy in 2012. He is a pharmacy practice resident at UPMC Presbyterian and is actively pursuing a career in clinical pharmacy in the Dallas-Fort Worth area.

Faculty Mentors: Deanne Hall, PharmD, CDE, BCACP, James Coons, PharmD, BCPS-CV

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: Patricia Klatt, PharmD, BCPS
Asst. Director: Roberta Farrah, PharmD, BCPS

Pharmacy at UPMC McKeesport
Jerad Heintz, PharmD

Pharmacy at UPMC Shadyside
Stephanie Ballard, PharmD

Pharmacy at Children's Hospital of Pittsburgh of UPMC
Jeffrey Goff, MS

Pharmacy at UPMC Hamot
Brad Cooper, PharmD

Managed Care at UPMC Health Plan
Director: Jessica Daw, PharmD

Managed Care at CVS Caremark
Michael Safranyos, PharmD

Community Pharmacy
Rite Aid Corporation, Giant Eagle Pharmacy
Director: Melissa Somma McGivney, PharmD, FCCP

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: Amy Seybert, PharmD, FASHP, FACCP

Family Medicine at UPMC St. Margaret
Director: Patricia Klatt, PharmD, BCPS
Asst. Director: Roberta Farrah, PharmD, BCPS

Geriatrics at UPMC Presbyterian Shadyside
Christine Ruby-Scelsi, PharmD, BCPS, FASCP

Geriatrics at UPMC St. Margaret
Heather Sakely, PharmD, BCPS

Health-System Pharmacy Administration at UPMC Presbyterian Shadyside
Jon Horton, PharmD

Infectious Diseases at UPMC Presbyterian Shadyside
Director: Brian Potoski, PharmD, BCPS-AQ (ID)

Pharmacy Residency Programs

Internal Medicine at UPMC
Presbyterian Shadyside
Director: Rima Mohammad, PharmD, BCPS

Medication Use Safety at UPMC
Presbyterian Shadyside
Sandra Kane-Gill, PharmD, FCCM, FACCP

Oncology at UPMC Cancer Centers
Director: James Natale, PharmD, BCOP

Solid Organ Transplant at UPMC
Presbyterian Shadyside
Director: Heather Johnson, PharmD, BCPS
Asst. Director: Michael Shullo, PharmD

Underserved Care and Global Health
Director: Sharon Connor, PharmD
Asst Director: Lauren Jonkman, PharmD

Residency Program Contact Information

University of Pittsburgh School of Pharmacy
Department of Pharmacy and Therapeutics
Pharmacy Residency Program

Kathleen Woodburn
Department of Pharmacy and Therapeutics
3501 Terrace Street
Salk Hall, Room 727
Pittsburgh, PA 15261

www.pharmacy.pitt.edu/programs/rxresidency
woodburnkm@upmc.edu