

# Resident Research

2007-08



University of Pittsburgh  
*School of Pharmacy*

# Table of Contents

Valuing Our Partners	2
School Mission and Vision	2
Message from the Dean	3
Pharmacy Residency Research Program	4
2007–08 School of Pharmacy Residents	5
Erik E. Abel	6
Benjamin J. Anderson	8
Megan R. Barkell	10
Nicole L. Cerussi	12
Laura Jankovic Damiano	14
Jocelyn L. Diehl	16
Daniel G. Ford	18
Gladys M. Garcia	20
Joedell M. Gonzaga	22
Stephanie M. Harriman	24
Pamela L. Havrilla	26
Whitney Hung	28
Lauren Fields Jonkman	30
Laura M. Krugger	32
Asma Lat	34
Stacey M. Lavsa	36
Katie McMillen	38
Radhika S. Polisetty	40
Ryan L. Steadman	42
Erin M. Suhrie	44
Katherine M. Sullivan	46
Christopher S. Wisniewski	48
School of Pharmacy Residency Programs	50
Contact Information	64

## Valuing Our Partners

The University Pittsburgh School of Pharmacy values our partnerships with the University of Pittsburgh Medical Center (UPMC), the UPMC Health Plan, the VA Pittsburgh Healthcare System (VAPHS), 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 2007 U.S. News and World Report rankings and is one of the leading integrated healthcare delivery systems in western Pennsylvania. UPMC Presbyterian Shadyside and UPMC St. Margaret hospitals participate in our residency programs.

UPMC Health Plan is the second largest insurer in western Pennsylvania and is ranked by U.S. News and World Report as the top-ranked health plan in Pennsylvania.

The VA Pittsburgh Healthcare System has a 128-bed tertiary care facility that serves as the referral center for other VA hospitals in Pennsylvania and West Virginia, and provides a wide range of inpatient and outpatient services.

Rite Aid Corporation is the third largest drugstore chain in the United States. It has annual revenues of more than \$27 billion, more than 5,000 stores in 31 states and the District of Columbia, with a strong presence on both the East and West coasts, and approximately 116,000 associates.

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, research, patient care, and service.

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.

## Message from the Dean

### Patricia D. Kroboth, PhD

Dear Members of the Resident Class of 2008,

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 Shadyside, UPMC St. Margaret, UPMC Health Plan, the VA Pittsburgh Healthcare System, Rite Aid, and CVS Caremark—have provided the rich environments for your residency experiences and learning. You have enriched each other with pharmacy backgrounds from Pennsylvania, Ohio, Florida, Texas, Rhode Island, New York, Minnesota, Massachusetts, California, Kentucky, and West Virginia.

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 have each 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

## Pharmacy Residency Research Program

### James P. Tsikouris, PharmD Director, Resident Research Series

The Residency Research Program at the University of Pittsburgh School of Pharmacy continues to employ a longitudinal research working group approach that fosters more focused interactive discussion, peer critique, 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. Once again this year's residents responded in outstanding fashion, demonstrating a true sense of personal ownership in their work.

In addition to the working group participation, residents are 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 School of Pharmacy, which ultimately results in well-rounded candidates eligible for a wide range of career opportunities.

The success of this program would not be possible without the working group facilitators and other major contributors: Kim Coley, Shelby Corman, Amy Donihi, Sandra Kane-Gill, Susan Skledar, and Raman Venkataramanan. Robert Weber, chair of the Department of Pharmacy and Therapeutics, must also be recognized for his continued dedication to the program. We greatly appreciate the continued support of Dean Patricia Kroboth and Senior Associate Dean Randall Smith. The data management skills of Melissa Saul were invaluable, and we thank her for her efforts. We would be remiss not to mention the fine administrative support of Susan Parnell and Kathleen Woodburn. Most importantly, this program would not be successful if it were not for the commitment of our outstanding residents and faculty advisors.

## 2007–08 School of Pharmacy Residents

Name	Residency
Erik E. Abel, PharmD	Cardiology
Benjamin J. Anderson, PharmD	Pharmacy Management
Megan R. Barkell, PharmD	Pharmacy - UPMC St. Margaret
Nicole L. Cerussi, PharmD	Pharmacy Management
Laura Jankovic Damiano, PharmD	Pharmacy - VA Pittsburgh Healthcare System
Jocelyn L. Diehl, PharmD	Managed Care UPMC Health Plan
Daniel G. Ford, PharmD	Critical Care
Gladys M. Garcia, PharmD	Community Care Pharmacy - UPMC Falk Pharmacy
Joedell M. Gonzaga, PharmD, MPH	Pharmacy Management
Stephanie M. Harriman, PharmD	Community Care Pharmacy - Rite Aid
Pamela L. Havrilla, PharmD	Pharmacy - UPMC Presbyterian Shadyside
Whitney Hung, PharmD	Pharmacy - UPMC Presbyterian Shadyside
Lauren Fields Jonkman, PharmD	Family Medicine
Laura M. Krugger, PharmD	Pharmacy - VA Pittsburgh Healthcare System
Asma Lat, PharmD	Pharmacy - UPMC Presbyterian Shadyside
Stacey M. Lavsa, PharmD	Pharmacy - UPMC Presbyterian Shadyside
Katie McMillen, PharmD, MPH	Pharmacy Management
Radhika S. Polisetty, PharmD, BCPS	Infectious Disease
Ryan L. Steadman, PharmD	Managed Care CVS Caremark
Erin M. Suhrie, PharmD	Pharmacy - VA Pittsburgh Healthcare System
Katherine M. Sullivan, PharmD	Pharmacy - UPMC St. Margaret
Christopher S. Wisniewski, PharmD	Drug Information

# A Clinical Outcomes Comparison Between Direct Thrombin Inhibitors (DTIs) for the Management of Heparin-Induced Thrombocytopenia (HIT) in Patients Receiving Hemodialysis

## **AUTHORS:**

Abel EE, Kane-Gill SL, Seybert AL

## **BACKGROUND:**

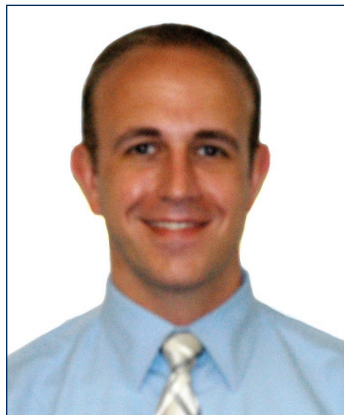
The thromboembolic risk associated with untreated HIT Type II can lead to severe life and/or limb threatening thromboembolic complications in more than 50% of patients. In order to prevent thromboembolic events in HIT, patients are managed with alternative anticoagulants, such as lepirudin, argatroban,

and bivalirudin. The only agents currently approved for the management of HIT are lepirudin and argatroban.

Patients receiving hemodialysis routinely require heparin for anticoagulation in order to maintain the patency of the vascular access and the circuit for continuous or intermittent renal replacement therapy. Suspected HIT has been reported to occur in 3.9% of patients receiving chronic dialysis, with positive HIT antibodies being found in up to 12% of these

---

## Erik E. Abel, PharmD



Erik is originally from Huntington, West Virginia, where he received a Bachelor of Science degree in biology from Marshall University in 2000. He earned his PharmD from West Virginia University in 2006, then went on to complete a pharmacy practice residency at The Ohio State University Medical Center. After completing his specialty residency in cardiology at the University of Pittsburgh Medical Center, Erik will be joining The Ohio State University Medical Center as a clinical specialist in cardiothoracic surgery. When not at work, Erik enjoys hanging out with friends and family, playing basketball or golf and watching the Food network, Sportscenter, football and basketball (particularly WVU). Erik's other interests include comedy, fantasy football, Texas hold-em, and cooking/grilling.

**Faculty Mentors:** Sandra Kane-Gill, PharmD, MSC, FCCM, and Amy L. Seybert, PharmD

**Award:** Recipient of a 2007 ASHP Pharmacy Resident Practice-Based Research Grant

patients. Despite the need, there is little data to guide the use of direct thrombin inhibitors (DTIs) in patients receiving hemodialysis for the medical management of HIT. This research will fill a gap in current research by providing a unique comparison of the clinical outcomes associated with DTI use in patients with HIT and receiving hemodialysis. In addition, this research will provide an assessment of the pharmacodynamic relationship of activated partial thromboplastin time (aPTT) and associated clinical outcomes of the different DTIs. Finally, this research will provide an evaluation of route of administration and dosage for DTIs and the related clinical outcomes.

## **PURPOSE:**

To compare the clinical outcomes of DTI use in hemodialysis patients with HIT/HITTS in the real-world setting.

## **OBJECTIVES:**

The objective is to compare the triple composite endpoint (thrombosis, bleeding, and mortality) between DTIs including an evaluation of the pharmacodynamic response (aPTT) in patients receiving dialysis that are diagnosed with HIT/HITTS and are managed with a direct thrombin inhibitor.

## **METHODS:**

A retrospective outcome evaluation will be performed using the institution's electronic data repository. All patients receiving hemodialysis and argatroban, bivalirudin, or lepirudin between January 1, 1995, and January 31, 2007, will be included. Diagnosis of HIT will be determined by exposure to heparin in the prior 100 days or documented heparin allergy and one or more of the following: (1) platelet count of less than 150,000/mm<sup>3</sup>; (2) decline in platelets of greater than 50% from baseline; and (3) documented ICD-9 diagnosis code for HIT. Patients less than 18 years of age will be excluded. The proposed data analysis for the primary outcome will be a comparison of the triple composite endpoint (thrombosis, bleeding, and mortality) between the three DTIs including an evaluation of the association between aPTT and the clinical endpoints.

## Comparison of Immunization Rates Between a Hospital-Based Outpatient Pharmacy Immunization Delivery Program and a General Medicine Clinic

### AUTHORS:

Anderson BJ, Hall DL, Mark SM, Skledar SJ, Saenz R, Culley CM, and Weber RJ

### PURPOSE:

The Healthy People 2010 goals list influenza immunization rates of greater than 90% as a goal for people greater than 65 years of age. The Center for Disease Control (CDC) has several groups that are recommended for influenza vaccination: patients over 50 years of age, patients with comorbidities under the age of

50, and health care workers. Published work exists demonstrating the positive effects that pharmacists involvement and pharmacist-led immunization initiatives can have on overall immunization rates. Currently pharmacies may not be viewed as primary locations to receive vaccinations; the study will look at improvement in baseline immunization rates of patients accessing the pharmacy as compared to rates of an internal medicine clinic.

---

## Benjamin J. Anderson, PharmD



Ben graduated from the University of Minnesota College of Pharmacy, Duluth Campus, in 2007. He was involved in several organizations, and through a rotation at ASHP became interested in pharmacy administration. Ben is currently finishing the first year of a two-year combined master's degree/pharmacy practice management residency, where he is concurrently completing a Master of Public Health degree. His future plans are to remain focused on year two of the residency and next year to pursue a position in an academic medical center. In his free time, Ben enjoys watching movies and hopes to rejoin a bowling league in the coming year.

**Faculty Mentors:** Deanne L. Hall, PharmD CDE, and Robert J. Weber, MS, FASHP

### METHODS:

Survey results will be obtained from patients accessing the pharmacy to obtain their immunization based on CDC recommendations, current influenza vaccination status, employer information, and where they received their current immunization. Medical record data will be compiled from an internal medicine clinic consisting of data elements collected by the survey. Based on a power analysis conducted to match 80% compliance at the clinic, with an alpha of 0.05 and a confidence interval of 95% and a sampling error of 5%, 246 people needed to be surveyed. Data will be evaluated to compare baseline immunization rates, increase in immunization rates from baseline, and total rate of immunization for each site.

### RESULTS:

A total of 622 patients accessed the pharmacy during the study. The survey was completed by 455 patients (73% response rate), and 69 surveys (15%) were omitted due to incomplete or inappropriately recorded responses. In the survey responders, 198 were previously immunized. Of the 188 patients needing immunization, 43 received immunizations (26%). The baseline influenza immunization rate at the pharmacy was 51% and an 11% increase was recorded. Comparator data will be obtained from the internal medicine clinic.

### CONCLUSION:

It is anticipated that the project will demonstrate favorable results from pharmacist-provided immunizations contributing to an increase of total immunization rates when compared to an internal medicine clinic.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.



## Motor Blockade in Patients Receiving Continuous Peripheral Nerve Block for Knee Arthroplasty: A Relationship Between Patient Demographics and Continuous Peripheral Nerve Block Variables

### AUTHORS:

Barkell MR, Heberlig SL, D'Amico FJ

### PURPOSE:

Following total knee arthroplasty (TKA), many studies have shown continuous peripheral nerve blocks (CPNBs) to be a safe and effective alternative to opioid epidural and patient-controlled analgesia while minimizing opioid induced adverse events. Although reported adverse events with CPNBs are rare, the adverse

event of motor block could theoretically impact rehabilitation and fall outcomes if experienced. The objective of this study is to determine if certain patient characteristics, the specific nerve innervated, the number of CPNBs, and cumulative dose of CPNB analgesia are risk factors for partial or complete motor block.

---

### Megan R. Barkell, PharmD



Megan graduated from the University of Pittsburgh School of Pharmacy in December of 2006. She has been a pharmacy practice resident at UPMC St. Margaret since the summer of 2007. She has accepted a unit-based pharmacist position at UPMC St. Margaret, and will also be involved in other clinical activity. Outside of her professional activities, she enjoys spending time with family and friends and outdoor activities.

**Faculty Mentor:** Stacey L. Heberlig, PharmD BCPP

### METHODS:

The health system's electronic medical record system was used to identify patients who have received a ropivacaine sciatic CPNB, femoral CPNB, or a combination for knee arthroplasty from August 1, 2006, to January 31, 2008. Patients under the age of 18 years were excluded from this study. The following data was collected: age, gender, body mass index, length of stay, co-morbidities, number and type of CPNB, cumulative dose of CPNB analgesia, and degree of motor block. The degree of motor block was collected and categorized as a presence of no motor block or presence of motor block from the anesthesiologists' post-operative day one through three records. The information was recorded without patient identifiers. For demographic variables, descriptive tests were utilized. T-tests were used for continuous variables, and Chi-Square or Fisher's Exact tests were utilized for categorical variables.

### RESULTS:

A total of 211 patients were identified to meet all inclusion criteria. Thirty patients were excluded from analysis due to no documentation of motor block assessment on any of the post-operative days. Twenty-five percent of patients experienced motor block on any one post-operative day. There was no statistically significant difference between those that experienced motor block and those that did not have motor block for variables of age, gender, body mass index, peripheral neuropathies, diabetes, hypothyroidism, or number of CPNBs infusing. Data of drug concentration

and rate have not been evaluated. There was a statistically significant lower length of stay for those patient who experience motor block (4.3 days vs 3.7 days;  $p < 0.01$ ).

### CONCLUSION:

A high percentage (25%) of patients experienced motor block with the use of CPNBs after TKA without an association for variables reviewed. Future direction would be to identify cause for increased incidence of motor block, improve system of documentation, and determine possible outcomes such as falls or decreased rehabilitation goals associated with motor block as an adverse event of CPNBs.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

## Effect of an E-mail Feedback System on Employee Tardiness

### AUTHORS:

Cerussi NL, Mark SM, Skledar SJ, Saenz R, Culley CM, Kirschling TE, Weber RJ

### PURPOSE:

Time and attendance violations are a chronic problem within the pharmacy department. Attendance violations such as tardiness are not only disruptive but also very costly and compromise the quality of work that is done. Most employees do not keep a record of their attendance violations and do not know how many late occurrences they have accumulated. An e-mail notification process was designed

to notify employees of their accumulated late occurrences each time they were late for work. It is expected that using an e-mail notification process will decrease rates of tardiness by keeping employees aware of their accumulated attendance violations. The goal is to determine the rate of full-time pharmacy technician tardiness after implementation of a feedback process.

### METHODS:

The employee time system was reviewed daily and compared to the pharmacy technician schedule to identify any full-time pharmacy

technicians reporting to work late. Upon each late occurrence, the employees received an e-mail notifying them of their accumulated late occurrences for the month and reminding them of the current time and attendance policy. Weekly tardiness rates were calculated by dividing the number of tardy occurrences by the number of scheduled shifts. The time system and pharmacy technician schedule was used to retrospectively determine the weekly tardiness rates of full-time pharmacy technicians prior to implementation of the employee feedback process. The time associated with each late occurrence was also recorded to determine how much work time was lost to tardiness.

### RESULTS:

The number of full-time technician shifts each week varied from 226 to 288 shifts, which were filled by 65-70 technicians. The rate of tardiness decreased from 12.7% before to 5.8% after implementation of the e-mail feedback system. The time associated with tardiness also decreased from 447 minutes (7.4 hours) to 218 minutes (3.6 hours), a 51% reduction in the amount of time lost to tardiness.

### CONCLUSION AND IMPLICATIONS:

This project demonstrates the benefit of and need for continuous time and attendance tracking within the pharmacy department, possibly through the addition of an employee to assist with tracking or through the creation or use of time and attendance software. Providing employees with real-time feedback had an impact on their future behavior. Other future

implications include addressing other time and attendance issues via a similar process or using a similar process for all pharmacy employees and/or in other departments.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Nicole L. Cerussi, PharmD



Nicole received a Bachelor of Science degree in chemistry from Penn State University and then earned her PharmD from the University of Pittsburgh School of Pharmacy in 2007. Her considerable involvement in organizations and activities over the years led to her interest in pharmacy management. Nicole will be starting her second year as a pharmacy practice management resident and completing her graduate coursework this fall earning a Master in Public Health degree in pharmacy administration. In her free time, Nicole enjoys being outdoors and spending time with friends and family.

**Faculty Mentors:** Scott M. Mark, PharmD, MS, MEd, FASHP, FACHE, and Robert J. Weber, MS, FASHP



## Evaluation to Determine if Colorectal Cancer Patients in the Veterans Affairs Pittsburgh Healthcare System Are Receiving Their Intended Courses of Chemotherapy and Identification of Factors Affecting This Outcome

### **AUTHORS:**

Jankovic LR, Heron BB, Good CB

### **PURPOSE:**

Chemotherapy provides a significant benefit to patients with colorectal cancer in both the adjuvant and metastatic settings. However, studies have shown that 20%-40% of these patients do not receive their intended courses of chemotherapy, and incompleteness of

chemotherapy has been associated with a survival disadvantage. In addition, these patients experience toxicities, incur costs, and are inconvenienced by incomplete course of chemotherapy that does not produce the intended benefit for their disease. Factors such as age, gender, marital status, and comorbidities have been associated with completion of chemotherapy. The aim of this study is to determine if colorectal cancer patients at

---

### Laura Jankovic Damiano, PharmD



Laura grew up in the suburbs of Pittsburgh and graduated from the University of Pittsburgh School of Pharmacy in April 2007. She decided to pursue a residency at the VA in order to gain more clinical experience in the areas of oncology, ambulatory care, and anticoagulation. After residency, she plans to obtain a clinical position at an academic medical center. In her free time, Laura enjoys traveling, photography, and rooting for the Pitt Panthers and Pittsburgh professional teams.

**Faculty Mentor:** Bernadette B. Heron, PharmD, BCOP

VAPHS are completing their intended courses of chemotherapy, and if not, to determine any factors that may prevent this veteran population from doing so.

### **METHODS:**

Colorectal cancer patients diagnosed or initiating chemotherapy from 2004-2006 were identified via VAPHS Cancer Registry. Deidentified data was collected via electronic chart review on those patients whose chemotherapy is initiated, administered and monitored solely through VAPHS. Data points collected include age, sex, race, marital status or evidence of social support, location of primary care, comorbidities, type of cancer, prescribing physician, number of cycles prescribed vs number completed, reasons for stopping, delaying or changing chemotherapy treatment, and adverse drug events. A multivariate logistic regression model was developed to determine predictors of inability to complete chemotherapy.

### **RESULTS:**

Results of this project are to be determined.

### **CONCLUSIONS AND CLINICAL IMPLICATIONS:**

The results of this project will provide information to VAPHS Hematology/Oncology service about the characteristics of this veteran population. This may assist them in their chemotherapy prescribing, as well as identify any areas within the healthcare system that can be improved, such as transportation, to optimize treatment of colorectal cancer for veteran patients.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

## Synagis® Noncompliance: A Retrospective Review of Medical Outcomes and Cost Impact

### AUTHORS:

Diehl JL, Daw JR, Rayburg RM

### PURPOSE:

Respiratory Syncytial Virus (RSV) is the leading cause of lower respiratory tract infections and hospitalization in infants. Nearly all infants are infected with RSV by the age of two, with no treatment currently in existence. Typical symptoms are similar to the common cold, though infants born prematurely or with chronic heart or lung conditions are at increased risk for more severe and potentially

life-threatening RSV infections. For these high-risk infants, palivizumab (Synagis) is a humanized monoclonal antibody given every 28 to 30 days during RSV season to prevent infection. Due to the frequency of dosing and high cost of the drug, compliance and efficacy are of interest from a managed care organization viewpoint. The study objective was to determine the impact of compliance on medical outcomes and the cost associated with noncompliance.

---

### Jocelyn L. Diehl, PharmD



Jocelyn grew up in Bedford, Pennsylvania, and received her PharmD from Duquesne University in 2007. She became interested in the managed care field after completing pharmacy school rotations with Rite Aid Health Solutions and Pfizer pharmaceuticals. Jocelyn completed a managed care pharmacy residency at UPMC Health Plan and accepted an offer to stay at the Health Plan as a clinical pharmacist specializing in the commercial line of business. In her spare time, Jocelyn enjoys traveling, shopping, and baking and is currently busy planning a 2009 wedding.

**Faculty Mentor:** Jessica R. Daw, PharmD

### METHODS:

This study was a retrospective analysis of pharmacy and medical claims from the October 15, 2006, to April 15, 2007, RSV season. Infants were included if they met prior authorization criteria based on the American Academy of Pediatrics guidelines and were excluded if they were not continuously enrolled with UPMC Health Plan during the study period. Compliance was measured based on a medication possession ratio (MPR) of 0.80, allowing up to a 37-day gap between pharmacy fills. Medical claims were identified via current procedural terminology (CPT) codes for physician office visits, emergency room (ER) visits, and hospitalizations with a primary International Classification of Diseases, ninth edition (ICD-9) code for a respiratory condition. Cost was evaluated using gross amount paid per each identified medical claim. Results were analyzed using descriptive statistics and Mann Whitney U test for nonparametric data.

### RESULTS:

Of the 237 infants included in the study, 70% (n=166) were deemed noncompliant. There was no correlation found between compliance and patient demographic data, number of member-months, or most commonly billed respiratory ICD-9 codes. Noncompliance correlated with increased ER visitation (p=0.03). Physician office visits (p=0.848) and hospitalization (p=0.662), were also higher in the noncompliant group but were not statistically significant. In terms of average cost per member, pharmacy costs were higher in the compliant group

(p=0.0009) and medical costs were found to be slightly higher in the noncompliant group, although not of significance (p=0.76). Total cost per member and per member per month (PMPM) were found to be higher in the compliant group (p=0.019 and 0.001, respectively).

### CONCLUSIONS AND CLINICAL IMPLICATIONS:

Overall compliance to palivizumab was not optimal. While compliance was shown to result in higher cost during the immediate RSV season, this can be attributed to higher utilization of a high-cost drug. Compliance resulted in fewer medical claims; therefore, the opportunity exists for future interventions with palivizumab compliance, which may be of benefit for further reduction in medical claims.

# Clinical Impact of Simulation-Based Learning Compared to Traditional Didactic Lecturing on Medication Administration Error Rates in Critically Ill Patients

## AUTHORS:

Ford DG, Seybert AL, Kane-Gill S

## PURPOSE:

Serious errors in the intensive care unit (ICU) are reported at rates of 149.7 per 1000 patient days; 11% of these were potentially life-threatening and 61% were medication errors.<sup>1</sup> ICU patients are at a high risk for medication errors due to the substantial quantity of medications administered, tenuous nature of

the patient and complexity of the environment.<sup>2</sup> Medication administration errors pose a unique problem because this is the last step in the medication use process, thus they are rarely intercepted before reaching the patient. Pharmacists routinely provide educational in-services to nursing staff in an effort to prevent medication errors. The objective of this study is to compare the effect of simulation-based learning to a lecture-style in-service on reducing medication administration errors in the ICU.

---

## Daniel G. Ford, PharmD



Dan graduated in the charter class of 2006 from the University of California, San Diego, Skaggs School of Pharmacy and Pharmaceutical Sciences. He then went on to complete his pharmacy practice residency at the University of California, San Francisco Medical Center. In order to achieve his career goal of becoming a critical care clinical pharmacist, he has finished his residency training at the University of Pittsburgh Medical Center as the critical care specialty resident. Dan has accepted a position at the Western Pennsylvania Hospital where he will help expand the clinical pharmacy services in the intensive care units.

**Faculty Mentors:** Amy L. Seybert, PharmD, and Sandra Kane-Gill, PharmD, MSC, FCCM

## METHODS:

This was a single-center, prospective, controlled study conducted in the medical intensive care unit (MICU) and coronary critical care unit (CCU). The study was approved by the institutional review board. Twelve nurses in the MICU and twelve nurses in the CCU were observed using the Barker method to identify medication administration errors during the baseline and post-intervention periods.<sup>3</sup> All aspects of the medication administration process were documented by the observer then retrospectively reviewed for medication administration errors by an expert panel blind to ICU and nurse name. Baseline data was used to develop the educational content of the in-services and determine the change in medication administration error rates after the intervention. The intervention consisted of educational in-services designed to address medication administration errors. Though covering the same content, the MICU nurses were presented with a traditional lecture and the CCU nurses attended a session using human-patient simulation. In-services were reviewed by a panel of critical care pharmacists not involved with the study to ensure equivalent content. A written quiz was given to each nurse before and after the in-service as well as a subjective assessment.

## RESULTS:

The primary outcome will be the change in medication error rates from baseline in each ICU. Secondary endpoints will be the average improvement in quiz scores and the compiled responses to the subjective in-service

evaluations. As this is a prospective study, final data were not available at the time of this abstract.

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

This study will provide insight into the clinical benefit of simulation-based education and evidence to further integrate simulation-based education into patient care. Potential study limitations include small sample size and the absence of a non-intervention control group in each ICU.

## REFERENCES:

1. Rothschild JM, et al. *Crit Care Med* 2005;33:1694-1700.
2. Kane-Gill S, Weber RJ. *Crit Care Clin* 2006;22:273-290.
3. Barker KN, et al. *Am J Health Syst Pharm* 2002;59:2314-2316.

Presented at the International Meeting on Simulation in Healthcare, Society for Simulation in Healthcare, January 14th, 2008, San Diego, California.

## Generating Demand for Medication Therapy Management Services: Identification of Employee Medication Related Needs and Values

### **AUTHORS:**

Garcia GM, Snyder ME, Harriman SM, Smith RB, McGivney MS

### **PURPOSE:**

To identify patient perceived medication-related needs, elicit patient's expected value of pharmacist-provided medication therapy management (MTM), and preferred strategies for marketing of MTM services.

### **METHODS:**

A qualitative thematic analysis of data collected during three focus group sessions with employees of the University of Pittsburgh was conducted. Study participants were recruited through the University Office of Human Resources 'wellness campaign' champions. Interested employees contacted the project coordinator to be screened for study eligibility. To be included, employees had to have at least one chronic medical condition that was being treated with a minimum of one chronic medication. Focus group moderators facilitated

each discussion through the use of a topic guide developed by the investigators. The topic guide included the following domains: 1) participants' perceived medication-related needs, 2) perceptions of pharmacist practice, 3) perceived value of MTM services, and 4) preferred strategy for marketing of MTM services. Between topic areas 2 and 3, the moderator used a scripted computer-based slideshow to introduce participants to the concept of MTM. During this slideshow, the moderator described the five core components of a MTM encounter and how these would be illustrated during a patient visit. Under each topic area, the moderator had a series of open-ended broad questions and more specific "probe" questions to elicit group discussion. Each session was audio-recorded and transcribed verbatim. Participants also completed an exit survey to collect patient demographic data. All participants received a \$25.00 gift card and all focus group sessions were held on the University campus.

### **RESULTS:**

A total of 26 university employees participated in focus groups. The mean age of these participants was 58 years. Of these employees 3 were male, 23 were female, 21 were staff, and 5 were faculty taking an average of 3-4 chronic medications. Analysis of this qualitative work is ongoing.

### **CONCLUSION:**

Preliminary data imply that understanding and acknowledging patients' perceived medication related needs and values is crucial for the

design of successful marketing strategies for MTM services. Information derived from this study can be incorporated into MTM training programs and public awareness/outreach approaches aimed at increasing patient participation in MTM services.

Presented at the 2008 American Pharmacists Association Annual Meeting, San Diego, California, and the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Gladys M. Garcia, PharmD



Gladys received her PharmD from St. John's University College of Pharmacy and Allied Health. She completed her pharmacy practice residency with emphasis in community care at the University of Pittsburgh School of Pharmacy. She has accepted a position as an assistant professor at the University of the Sciences in Philadelphia College of Pharmacy. Her professional interests include developing pharmacist-patient care practices in the community and completing a Master of Business Administration degree. Outside of pharmacy, she enjoys cooking, Latin music, and spending time with friends and family.

**Faculty Mentor:** Melissa Somma McGivney, PharmD

**Awards:** Recipient of a 2007 APhA Foundation Incentive Grant for Community Pharmacy Residents



## Management of Drug Inventory in the Operating Room Satellite Pharmacy with the Utilization of Computerized Inventory Control System

### **AUTHORS:**

Gonzaga JM, Oriolo VA, Mark SM, Skledar SJ, Culley CM, Lacava AH, Augustine J, Weber RJ

### **PURPOSE:**

Maintaining proper drug control in the pharmacy department helps to ensure appropriate drug availability and decreases drug costs. Drug inventory in the Operating Room Satellite Pharmacy (ORSP) accounts for nearly 10% of the total drug expense for the

pharmacy department at UPMC Presbyterian for fiscal year 07 (FY07). Baseline data for FY07 show a loss of \$500,000 due to lost drug costs or drugs not properly billed. Currently, drug inventory control is a manual system where drug ordering and restocking rely on pharmacy staff members tracking the inventory. This can result in inaccurate inventory and potential loss of revenue. Accountability for the drugs is dependent on the OR billing process, which relies on documentation of

---

### Joedell M. Gonzaga, PharmD, MPH



Joe was raised in Milwaukee, Wisconsin, and received a Bachelor of Science degree in political science from the University of Wisconsin-Madison. He earned a PharmD degree from Northeastern University in Boston, Massachusetts, in 2006. Joe is currently in his second year of the pharmacy management residency at UPMC. Upon completion of the pharmacy management residency, Joe will assume a position as a pharmacy informatics supervisor at Allegheny General Hospital. His professional interests include systems management, informatics, and quality improvement. In his spare time, Joe enjoys golf, tennis, cooking, and chess.

**Faculty Mentors:** Scott M. Mark, PharmD MS, MEd, FASHP, FACHE, and Vince A. Oriolo RPh

the drug given to a patient. The lost drug cost for the undocumented use or waste of drugs affects the overall drug budget of the pharmacy department. New technology such as a computerized inventory control system can reduce the complexity and improve drug inventory and accountability by monitoring inventory distribution. By implementing a computerized inventory control system, drug inventory management should improve.

The hypothesis is that the implementation of a computerized inventory control system in the OR will improve drug accountability and inventory control. The aim of the study is to evaluate the effectiveness of a computerized inventory control system by measuring the decrease in drug purchases and improved availability of drugs in the ORSP compared to data from FY07.

### **METHODS:**

During the study period, drug inventory in the ORSP will be entered into the computerized inventory control system. With the use of barcode technology, inventory will be decremented by the pharmacy staff member upon request by surgery staff. Inventory usage reports generated will be compared to corresponding OR drug charges. Inventory purchasing reports will be compared to the annual FY07 reports to evaluate changes in purchases. Effectiveness will be based on improved inventory accuracy and reduction in lost drugs costs.

### **RESULTS:**

The data showed little improvement in inventory control. The results in difference in drugs ordered to percentage billed from January–April 2007 averaged 38.4% compared to 35.4% during the same period of time in 2008. This 3% decrease resulted in a total drug cost savings of \$16,000.

### **CONCLUSION:**

Although it was predicted that the computerized inventory control system would improve drug inventory management, after four months after implementation of the computerized inventory control system, there was not a significant difference. However, the study was able to identify potential causes such as OR staff members preparing drugs prior to surgery and discarding them if not used. The evidence shows that participation in drug inventory control needs to extend beyond the ORSP. This information will help to further improve inventory management in the ORSP.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

## Analysis of Physician-Identified Medication-Related Needs in the Community and Subsequent Opportunities for Pharmacist-Provided Medication Therapy Management (MTM)

### **AUTHORS:**

Harriman SM, Garcia GM, Pringle JL, Smith RB, Somma McGivney MA

### **PURPOSE:**

Medication Therapy Management requires a comprehensive evaluation of a patient's medication regimen, ideally face-to-face, and collaboration with the patient's physician(s) in order to address all of the medication-related needs of the patient. Yet, not all physicians

know what MTM services are or what to expect from the pharmacist in terms of the clinical contribution to the patient's care beyond the provision of drug product. There is a need for pharmacists to be able to better identify the needs physicians have regarding patient medication regimens and successfully approach the physician in order to propose coordination of patient care. The objective of the study is to identify, from the physician perspective, unmet patient medication-related needs and how these

---

## Stephanie M. Harriman, PharmD



Stephanie graduated from the University of Pittsburgh School of Pharmacy in 2007. As a student pharmacist, Stephanie's internships and clinical rotations led her to pursue her interests in community-based patient care. Stephanie completed the community care pharmacy practice residency with the University of Pittsburgh School of Pharmacy and Rite Aid Corporation. She plans to continue providing patient care in an outpatient setting in the Pittsburgh area. Outside of pharmacy, Stephanie enjoys traveling to visit friends and family.

**Faculty Mentor:** Melissa Somma McGivney, PharmD

**Awards:** Recipient of a 2007 APhA Foundation Incentive Grant for Community Pharmacy Residents and a 2007 NACDS Foundation Mission Advancing Grant

needs can be fulfilled by pharmacist provision of MTM services.

### **METHODS:**

Three scientifically designed focus groups were conducted consisting of primary care physicians practicing in Pennsylvania. Participants were identified through membership in the Pennsylvania Medical Society. Focus groups were conducted in Pittsburgh (n = 9), York (n = 6), and Philadelphia (n = 8). During each focus group session participants were asked a series of literature-based questions through a semi-structured interview process in order to elicit their perceived medication-related patient care needs, probe if and how those needs are currently being met and identify benefits and concerns to pharmacist provision of MTM. Participants were asked to complete an anonymous exit survey upon completion of the focus group session. The dialogue from these sessions was audiotaped and transcribed. These transcripts were subject to qualitative data analysis through an iterative coding process conducted by two independent raters to identify repeating themes.

### **RESULTS:**

Data analysis is currently ongoing.

### **CONCLUSION AND CLINICAL IMPLICATIONS:**

It is believed that there is a great need in the community for physician-pharmacist collaboration in order to best care for patients. Understanding the needs of community-based physicians will aid pharmacists in successfully marketing their services to physicians and ultimately in developing effective collaborative relationships. The results will be disseminated to the pharmacy community, and incorporated into MTM training programs and pharmacy school curriculum.

Presented at the 2008 American Pharmacists Association Annual Meeting in San Diego, California in March 2008 and the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.



## Pharmacist-Provided Immunization: An Opportunity for Identification of Drug-Related Problems

### AUTHORS:

Havrilla PL, Ruby CM, Sokos DR

### PURPOSE:

The need for pharmacist involvement in the medication management of the elderly is evident in the high numbers of drug-related problems and adverse drug reactions that occur in this vulnerable population. Pharmacists have the authority to administer vaccines in nearly every state. Following vaccine administration, patients are asked to wait 15 minutes to observe for serious adverse reactions. This study was

performed to evaluate the recommended waiting period as an opportunity for pharmacists to identify drug related problems in an ambulatory elderly population who otherwise might not have been seen by a pharmacist.

### METHODS:

This was a prospective study that was performed beginning in January 2008 in a university-based geriatric clinic. Patients scheduled an appointment with the geriatric clinical pharmacist to receive the varicella

zoster vaccine due to a referral from their physician. Consent was obtained from each patient prior to inclusion in the study. After the administration of the vaccine, the patients were observed for any signs of anaphylaxis or syncope during a recommended 15-minute post-vaccine waiting period. This time was also utilized by the clinical pharmacist to conduct a medication review using a medication evaluation instrument to identify drug-related problems. The medication evaluation instrument is a combination of the Morisky and Sackett scales, the Medication Appropriateness Index, and the Assessment of Underutilization. Follow-up care was provided to the patients depending upon the drug related problems identified during the medication evaluation.

### CONCLUSION:

The 15 minutes after an immunization session were effectively used by a pharmacist to identify drug-related problems in elderly patients whose medication regimen may not have been otherwise evaluated by a pharmacist. The time after the administration of a vaccine may be used by community pharmacists to improve patient care and the medication taking behavior of their patients.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Pamela L. Havrilla, PharmD



Pam graduated summa cum laude from the University of Pittsburgh School of Pharmacy in 2007. Working with the critical care faculty members during her last year of pharmacy school solidified Pam's primary clinical interest in critical care. Pam completed the pharmacy practice residency at UPMC Presbyterian Shadyside and will remain at UPMC Presbyterian Shadyside to complete a critical care specialty pharmacy residency. She is excited to further explore the world of critical care and gain further experience teaching pharmacy students at the University of Pittsburgh School of Pharmacy. Her career goal is to become a critical care specialist at an academic medical center and a faculty member at an associated school of

pharmacy. Outside of her pharmacy career, Pam loves spending time with her family and friends, watching the Pittsburgh Penguins, and baking cookies.

**Faculty Mentors:** Christine M. Ruby, PharmD, BCPS, FASCP, and Denise R. Sokos, PharmD, BCPS

### RESULTS:

Interim results for 11 patients that participated in the study are reported. Overall, 21 drug-related problems were discovered while interviewing patients. The number and types of drug-related problems that are identified, as well as, the follow-up care that is received by the patient will be documented and presented. On average, the medication evaluation was conducted in 12 minutes and greater than 2 drug-related problems were found per patient. The most common drug-related problems identified were presence of osteoporosis and the patient not taking a bisphosphonate or calcium, incorrect dose, and incorrect directions. The majority of patients had their physician contacted with recommendations, and all patients received further education by the pharmacist as a follow-up activity.

## Early Detection of Persistent Post-Kidney Transplant Anemia

### AUTHORS:

Hung WY, Corman SL, Schonder KS

### PURPOSE:

Anemia following kidney transplantation is expected to resolve within two to six months; however, 30-40% of patients will have persistent anemia. Post-transplantation anemia (PTA) may increase the risk of cardiovascular events and is associated with worsening graft function. The use of erythropoiesis stimulating agents (ESAs) immediately after transplant is controversial owing to the lack of clinical evidence, safety concerns, and high cost of

these agents. The early identification of patients at risk for persistent PTA could aid in the selection of patients most appropriate for ESA therapy.

### METHODS:

This retrospective, case-cohort study included patients who received kidney transplants at the University of Pittsburgh Medical Center between January 1, 2002, and June 30, 2007. Data were collected from inpatient and outpatient electronic medical records and were de-identified by an honest broker. Patients with persistent PTA, defined as hemoglobin less

than 11 g/dl two months post-transplant, were identified. The characteristics of these patients were compared to those without persistent PTA using univariate and multivariate analysis in order to determine which demographic and clinical characteristics, if present in the first week post-transplant, are predictors of persistent PTA. In addition, the time to resolution of PTA in patients receiving ESAs will be compared to that in patients who were not treated with ESAs.

### RESULTS:

Data analysis is in progress. Significant predictors of persistent PTA will be reported.

### CONCLUSION:

It is expected that this project will identify predictors of persistent PTA that can be identified within one week following kidney transplant. Identifying these factors will help clinicians to determine which patients are most likely to benefit from ESA therapy.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Whitney Hung, PharmD



Whitney received her BS degree in pharmacy in Taiwan in 2001. Through three years of experience working at a pharmaceutical company, she became interested in infectious diseases and critical care. Whitney traveled to the United States and earned her PharmD from NOVA Southeastern University in 2006 and completed the pharmacy practice residency at UPMC Presbyterian. She set a career goal to become a clinical pharmacist and researcher at a teaching hospital. Outside of her work in pharmacy, Whitney loves music, traveling, photography, and watching professional basketball games.

**Faculty Mentor:** Kristine S. Schonder, PharmD

## Assessment of Outpatient Anticoagulation Management at UPMC St. Margaret Family Medicine Residency Program

### AUTHORS:

Jonkman LF, Farrah RM, Klatt PM

### PURPOSE:

The management of outpatient anticoagulation is an important skill for every family physician to master, as warfarin is well known as a contributor to numerous emergency department visits. Family medicine residents at UPMC St. Margaret learn and practice the safe and effective management of anticoagulation in multiple ways, but specifically during their medication management rotation during the

second year. The hypothesis is that residents who have completed their medication management rotation will be more proficient in managing outpatient warfarin therapy.

### METHODS:

A series of outpatient warfarin case scenarios was developed to evaluate the safe and effective management of warfarin. Scenarios were designed from actual medication management patient encounters and were reviewed by 3 clinical pharmacists for content. The survey was piloted by family medicine

faculty development fellows. Family medicine residents at UPMC St. Margaret were asked to anonymously provide responses to the patient case scenarios. In addition, residents were asked to rate their comfort in managing outpatient anticoagulation (10 point Likert scale). Two of the investigators independently scored the responses to patient case scenarios for both safety and appropriateness of dosing regimen and interval for re-evaluation. Mean scores between groups were analyzed using ANOVA.

### RESULTS:

A total of 24 family medicine residents completed the assessment (65% response rate). Of these, 7 were interns, 7 were second-year residents and 8 were third-year residents. Of the second-year residents, 4 had finished their medication management rotation. For interns, second year and third year, mean score on patient cases was 7.29 (95% CI, 6.13-8.45), 6.43 (95% CI, 5.25-7.61), 7.25 (95% CI, 6.38-8.12), respectively. For interns, 2nd year and 3rd year, mean Likert score for self-rated comfort with anticoagulation management was 3.42 (95% CI, 2.25-4.60), 5.07 (95% CI, 2.40-7.75), 5.75 (95% CI, 3.98-7.52), respectively. No statistically significant differences were identified between years.

### CONCLUSIONS:

Based on the sample size, no statistically significant differences were identified between resident years. All residents on average scored relatively low on the anticoagulation assessment, indicating a need for further training and practice.

---

## Lauren Fields Jonkman, PharmD



Lauren grew up in Bethlehem, Pennsylvania, and attended the University of Pittsburgh, receiving her PharmD in 2006. She subsequently began a two-year residency program at UPMC St. Margaret focusing in pharmacy practice, family medicine, and faculty development. She is additionally pursuing a Master in Public Health degree. Other interests include community-oriented primary care, health behavior theory, care to the underserved, and global health. She is planning to remain in Pittsburgh next year where she will be able to finish her MPH, continue volunteering at Birmingham Clinic, and attend as many Pirates games as possible.

**Faculty Mentor:** Roberta M. Farrah, PharmD, BCPS

## Implementation of Periprocedural Anticoagulation Bridging Therapy Guidelines

### **AUTHORS:**

Kruger LM, Kruszewski M, Trilli L, Burke T, Gerber L

### **PURPOSE:**

Patients at risk of arterial or venous thromboembolism commonly receive chronic oral anticoagulant therapy with warfarin. Occasionally in these patients chronic warfarin therapy may need to be interrupted to allow surgery or other invasive procedures to be performed. One way to manage the problem of maintaining anticoagulation is to

discontinue warfarin prior to the procedure and initiate periprocedural 'bridge' therapy with unfractionated heparin (UFH) or low molecular weight heparin (LMWH) around the time of the procedure. Unfortunately, there is lack of consensus on appropriate periprocedural management due to the lack of large-scale clinical trials evaluating safety, efficacy, and cost effectiveness of different agents. The objective of this study was to develop appropriate periprocedural anticoagulation guidelines.

---

### Laura M. Kruger, PharmD



Laura is originally from Edinboro, Pennsylvania, and received her PharmD degree from the University of Pittsburgh in April 2007. Her desire to expand her clinical knowledge and experience led her to choose the pharmacy residency at the VA Pittsburgh Healthcare System. She hopes to enhance her patient-care skills and become a more confident and proficient clinician. Outside of pharmacy, she enjoys spending time with friends and family, movies, live music, shopping, and traveling.

**Faculty Mentors:** Lauren Trilli, PharmD, BCPS, and Matthew Kruszewski, PharmD, BCPS

### **METHODS:**

A thorough review of the literature that discusses the risks of thromboembolism and bleeding associated with periprocedural bridging therapy have been integrated to develop guidelines for appropriate periprocedural bridging therapy. The guidelines will focus on appropriate use of SQ agents (LMWH and fondaparinux) over UFH to decrease costly inpatient hospitalizations and length of stay. A drug-ordering template will be implemented into the computerized patient record system (CPRS) that encompasses the recommendations for dosing, monitoring, and appropriate follow-up. A baseline drug-utilization evaluation (DUE) has been performed to assess overall VAPHS costs, use of LMWH and UFH, and length of stay. This baseline DUE will be compared to a follow-up DUE after implementation of the guidelines.

### **RESULTS:**

The results of the baseline DUE show that the average duration of bridge therapy was 10 days. Average length of stay was 6.2 days, but varied greatly from 9.6 days to 1.3 days based on whether the patients received UFH or SQ agents. These results show that there is potential for VAPHS to save ~\$240,000 per quarter if patients were switched to SQ agents due to reduction in length of stay. The guidelines are in the process of being implemented into CPRS. After implementation, the follow-up DUE will be performed.

### **CONCLUSIONS AND CLINICAL IMPLICATIONS:**

The implementation of periprocedural bridging therapy guidelines should increase provider awareness of the recommendations for dosing, monitoring, and follow-up in order to promote maximal efficacy and safety. It is anticipated that implementation of periprocedural anticoagulation guidelines will reduce overall costs at VAPHS due to decreasing length of stay.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

Planned presentation at VISN 4 Pharmacy Strategic Planning Conference, State College, Pennsylvania, 2008.



## Retrospective Evaluation of Postoperative Glycemic Control and Outcomes in Liver Transplant Recipients

### AUTHORS:

Lat A, Johnson HJ, Donihi AC

### PURPOSE:

Hyperglycemia is common in hospitalized patients and has been correlated with increased morbidity and mortality in critically ill patients with and without diabetes. Currently, it is unknown whether postoperative tight glycemic control benefits patients following liver transplantation. This study examined the effect of maintaining postoperative glycemic control in liver transplant recipients on the incidence of

postoperative infections, length of stay (LOS), and mortality.

### METHODS:

Medical records of all adult patients admitted during 2006 for liver transplantation were collected from the Medical ARchival System (MARS) by an honest broker. Baseline recipient and donor demographics and morbidity and mortality outcomes were compared between liver transplant recipients who achieved postoperative glycemic control and those who did not.

### RESULTS:

During 2006, 127 unique patients were admitted to our hospital and received a liver transplant during the index admission; 22 patients were excluded. Of the 105 included patients, 52 (49.5%) achieved glycemic control and 53 (50.5%) were poorly controlled. Though not statistically significant, more patients in the glycemic control group required preoperative hemodialysis, had more severe liver disease as measured by mean MELD scores, and had longer median preoperative hospital lengths of stay. More patients in the poor glycemic control group were known diabetics.

Recipients in the glycemic control group spent significantly more time at control than the poorly controlled group, but more patients also experienced hypoglycemic episodes (7 versus 1,  $P = 0.02$ ). Postoperative infections and median ICU and hospital LOS did not differ significantly between the groups, though tended to be worse in the glycemic control group. There were three in-hospital deaths among the study participants, and all three deaths occurred in the glycemic control group while in the ICU (3 versus 0,  $P = 0.12$ ).

When patients were compared based upon  $<75\%$  time  $\leq 150$  mg/dL ( $n = 28$ ) versus  $\geq 75\%$  time at  $\leq 150$  mg/dL ( $n = 77$ ), significant baseline differences were present. The group that spent the majority of time at BG control had higher MELD scores (22.7 versus 17.8,  $P = 0.03$ ), more preoperative renal failure (35.7% versus 6.5%,  $P = <0.01$ ), and longer preoperative hospital LOS (median 1 day versus 0 days,  $P = <0.01$ ). This group also had significantly

worse postoperative outcomes, with more infections (67.9% versus 42.9%,  $P = 0.03$ ), longer postoperative ICU LOS (median 16.0 versus 7.0,  $P = 0.04$ ), and increased mortality (3 deaths versus 0 deaths,  $P = 0.02$ ).

### CONCLUSIONS AND CLINICAL IMPLICATIONS:

Liver transplant recipients with mean postoperative BG  $\leq 150$  mg/dL did not have improved morbidity and mortality outcomes compared to patients with mean postoperative BG  $>150$  mg/dL. Patients  $\geq 75\%$  time at  $\leq 150$  mg/dL had longer postoperative ICU LOS and increased mortality and infections than those with  $<75\%$  time at  $\leq 150$  mg/dL, but were also more severely ill prior to transplant. These findings suggest that postoperative tight glycemic control in liver transplant recipients may not be sufficient to improve morbidity and mortality outcomes in patients already at high risk for poor outcomes.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

## Asma Lat, PharmD



Asma received her PharmD degree from The University of Texas at Austin in 2007. She developed an interest in infectious diseases and critical care during her clinical rotations as a student. Asma completed the PGY1 pharmacy residency at UPMC Presbyterian Shadyside, and has accepted a position for a PGY2 specialty residency in infectious diseases at the South Texas VA and University of Texas Health Science Center at San Antonio. Upon completion of her postgraduate training, Asma plans to obtain a position as an infectious diseases specialist at an academic medical center. Her outside interests include reading, watching Texas Longhorns sports, and spending time with family and friends.

**Faculty Mentors:** Heather J. Johnson, PharmD, BCPS, and Amy C. Donihi, PharmD, BCPS

## Assessment of Fall Risk in Psychiatric Inpatients: a Case-Controlled Study

### AUTHORS:

Lavsa SM, Fabian TJ, Shirley KL, Corman SC, Coley KC

### PURPOSE:

Among hospitalized patients falls are the leading cause of inpatient accidents. Identification of the patients at highest risk of falling is essential to ensure effectiveness of a fall prevention program. Our inpatient psychiatric institution currently utilizes a fall risk assessment tool designed for a general inpatient population which is used throughout the health system. Few data are available

regarding factors associated with fall risk in psychiatric inpatients; however, this patient population may be at increased risk for falls due to multiple psychotropic medications. The purpose of this study was to investigate the association between select medications and diagnoses and increased fall risk among psychiatric inpatients.

### METHODS:

The study was conducted at the Western Psychiatric Institute and Clinic (WPIC) and included adult psychiatric inpatients with documented falls in the WPIC falls database.

Cases were matched to controls (1:1) by admission year, sex and age and additional data were collected from the Medical ARchival System (MARS) by an honest broker. Univariate logistic regression models were developed for each risk factor to determine its impact on fall risk. Significant factors ( $p < 0.1$ ) from the univariate models were entered into a multivariate regression model.

### RESULTS:

Variables in the multivariate regression showing a statistically greater risk of falling included non-selective alpha-blockers, non-benzodiazepine sleep aids, benzodiazepines, histamine-2 blockers, lithium, atypical antipsychotics, selective serotonin-reuptake inhibitors, dementia and Alzheimer's disease, atypical antidepressants, anticonvulsants, opiates, traditional antipsychotics, laxatives and stool softeners and beta-blockers. Drug dependence is associated with a statistically lower risk of falling.

### CONCLUSIONS AND CLINICAL IMPLICATIONS:

Medications and diagnoses found to be significantly associated with falling in this study can be used to identify patients at highest risk falling. Fall prevention assessment tools can be better designed based on the results of this study to improve fall prevention programs in this patient population.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Stacey M. Lavsa, PharmD



Stacey received her PharmD degree from the University of Pittsburgh School of Pharmacy in 2007. Her areas of interest include drug information/drug use management, internal medicine, and research. After completion of her pharmacy practice residency, she will be staying at the University of Pittsburgh Medical Center to complete a drug information residency. She plans to pursue a faculty position that includes responsibilities in drug information/drug use management, internal medicine, research, and teaching. Outside of pharmacy, she enjoys spending time with friends, gardening, bowling, and watching Pitt men's basketball.

**Faculty Mentors:** Kim C. Coley, PharmD, FCCP, and Tanya J. Fabian, PharmD, PhD



## A Study of Order-Entry Time after Implementation of an Electronic Medication Administration Record

### **AUTHORS:**

McMillen K, Mark SM, Oriolo VA, Skledar SJ, Culley CM, Weber RJ

### **PURPOSE:**

The growth of health care technology has resulted in the implementation of complex integrated computer systems. This has led to establishing best patient practices and increasing medication safety. However, the implementation of new technology may include additional steps in the workflow process requiring additional staffing support. The

goal of this study is to measure the change in key volume indicators (KVI) and required full-time equivalents (FTEs) following the implementation of barcode medication administration (BCMA) and electronic medication administration record system (eMAR) at a large academic medical institution.

### **METHODS:**

During the months of November and December 2007, the pharmacy department performed time-motion studies to determine the time required to complete order-entry activities.

The order-entry activities were identified through a Cerner Pharmnet® Pharmacy Workload Activity Report. Order entry activities were divided into three categories: intravenous (IV) medications, oral medications and total parental nutrition (TPN). Each category was evaluated separately to account for the time difference required to complete each activity due to task complexity and the differentiation of activities defined in the Workload Activity Report.

### **RESULTS:**

Results showed an increase in the amount of time required to perform order-entry activities. Over the two months, the number of order-entry observations in the assessment of pharmacy productivity and workload included a total of 1,312 observations. Seventy (5.3%) orders were excluded. Of the remaining 1,242, there were 1,049 oral medication order entry observations, 182 IV medication order entry observations, and 81 TPN order entry observations. The current order entry standard was compared to the new observed order entry standard to reflect the difference in the time required to perform the activity. Results of the observations show that oral medications reflected a 0:38 second (30%) increase, IV order entry reflected a 0:20 second (11%) increase, and TPNs increased by 1:11 minutes from the current standard in the time required to perform the respective activity after implementation of eMar and BCMA.

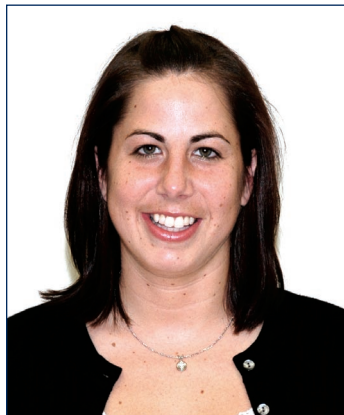
### **CONCLUSION:**

This project has demonstrated the value of assessing order-entry workload after implementation of eMAR and BCMA. At UPMC, this information was used to justify the additional FTEs required for the increase in direct required hours.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Katie McMillen, PharmD, MPH



Katie is from Pittsburgh, Pennsylvania, and received her PharmD degree from the University of Pittsburgh in 2005 and Master in Public Health degree in 2008. She worked as an intern and pharmacist at UPMC Western Psychiatric Institute & Clinic prior to beginning the pharmacy practice management residency at UPMC. She is excited to be one of the first residents to graduate from the two-year program that now includes a Master of Public Health degree in hospital pharmacy administration. Katie has accepted an operations manager position at UPMC Presbyterian. Katie's outside interests include shopping and watching the Pitt men's basketball team.

**Faculty Mentors:** Robert J. Weber, MS, FASHP, and Scott M. Mark, PharmD, MS, MEd, FASHP, FACHE

## Risk Factors for Piperacillin/Tazobactam Resistance in Extended-Spectrum Beta-Lactamase (ESBL) Producing Bacteria

### AUTHORS:

Polisetty RS, Potoski BA, Paterson DL

### PURPOSE:

Organisms producing ESBLs are resistant to multiple antimicrobial agents, and treatment options are limited. In documented ESBL infections, beta-lactams should not be used as treatment; however, uncertainty exists as to whether piperacillin/tazobactam (P/T) is an appropriate agent. Due to this uncertainty, P/T may be used for the treatment of ESBL organisms. Identifying the risk factors

associated with P/T resistance may allow for more appropriate antimicrobial selection. We therefore designed this retrospective study in an attempt to determine those risk factors.

### METHODS:

Patients admitted to the University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, between 07/2004 through 08/2007 were queried to identify eligibility for this study which employed a case-control design. The resistant and susceptible case groups consisted of patients with clinical

cultures positive for P/T resistant ESBLs and P/T susceptible ESBLs respectively. Patients with positive cultures within the first 72 hours of admission were excluded. Controls were randomly selected from the same medical and surgical services as cases in a 2:1 ratio. Patients selected as controls could not be cases. Data for each patient were obtained via comprehensive review of the microbiology and pharmacy databases, as well as electronic patient records. Variables analyzed as risk factors included demographics, medical comorbidities, and receipt of antibiotics in the last 30 and 90 days.

### RESULTS:

Sixty-five patients were identified for each of the case groups. The control group was made up of 130 patients. In the multivariate model, admission from a nursing home (OR 22.77; 95% CI 5.5-93.7), transfer from outside hospital (OR 4.95; 95% CI 1.58-15.50), mechanical ventilation (OR 4.87; 95% CI 1.61-14.80), length of stay (OR 1.08 96% CI 1.05-1.12), receipt of ampicillin/sulbactam 30 days prior (OR 13.08; 95% CI 3.27-52.25), and receipt of ciprofloxacin 30 days prior (OR 8.38; 95% CI 1.87-37.54) were risk factors specific for P/T resistance in ESBL organisms.

### CONCLUSIONS:

Risk factors identified by this study highlight the importance of prior antibiotic exposure and patient status when evaluating initial therapy for ESBL producing organisms. This data may lead to better antibiotic selection, particularly in institutions that endorse the use of P/T in the treatment of organisms producing ESBLs.

Presented at the Making a Difference in Infectious Diseases (MAD-ID) meeting in Orlando, Florida, in May 2008

Abstract submitted to the 48th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy and 46th Annual Meeting of the Infectious Diseases Society of America (ICAAC/IDSA), Washington, D.C., October 2008.

---

## Radhika S. Polisetty, PharmD, BCPS



Radhika graduated from the University of Kentucky College of Pharmacy in 2006. She became extremely interested in infectious diseases during her clinical rotations in pharmacy school. Radhika completed the pharmacy practice residency at the University of Pittsburgh Medical Center (UPMC) Presbyterian Shadyside and stayed on to complete an infectious diseases specialty residency. Radhika has accepted a position as an infectious diseases clinical pharmacist at Hahnemann University Hospital in Philadelphia, Pennsylvania, where she hopes to combine her interest in clinical practice with teaching and clinical research. Outside of the pharmacy world, Radhika likes to travel and spend time with family and friends.

**Faculty Mentor:** Brian A. Potoski, PharmD, BCPS

## Cost Savings of Retrospective DUR on NSAID Therapeutic Duplications in the Elderly Population

### **AUTHORS:**

Steadman RL, Tracy CJ, Legal JD, Kasper K

### **PURPOSE:**

Prospective Drug Utilization Review (DUR) is currently conducted on prescriptions filled at retail or mail-order pharmacies. Pharmacy benefit management (PBM) companies offer retrospective DUR as an additional cost savings program to monitor for scenarios such as therapeutic duplications (TDs), drug-drug interactions, and brand to generic opportunities. The goal of this study was to

demonstrate the cost savings of a retrospective DUR program related to non-steroidal anti-inflammatory drug (NSAID) TDs in the elderly population ( $\geq 65$  y.o.).

### **METHODS:**

This study was a retrospective, single center, cohort study conducted at a large PBM that compared total cost savings related to NSAID prescriptions involved in TDs between a group enrolled in the retrospective DUR program and a group not enrolled in the program. The costs were reviewed for one year following an

initial NSAID duplication. For inclusion in the study, the initial duplication had to occur in the observational period between April 1, 2006, and June 30, 2006. The primary outcome of this study was to compare the NSAID cost savings (from the observational and follow-up periods) between the two groups. The secondary outcome was to compare the decrease in mean NSAID day supply after the initial TD. Baseline data collected included gender, age, baseline costs (member costs and plan costs), generic utilization, number of NSAIDs filled, number of TDs, number of multiple pharmacy TDs, number of multiple provider TDs, number of multiple pharmacy/provider TDs and number of interventions (letters to prescribers) that occurred in the DUR group.

### **RESULTS:**

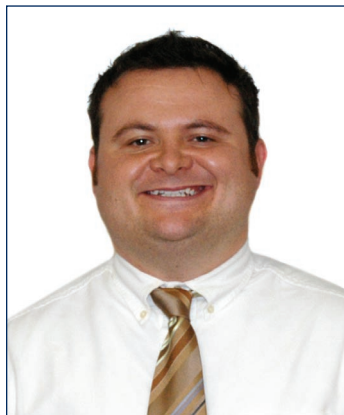
There were a total of 1,215 NSAIDs filled yielding 306 TDs in the DUR group and 1,295 NSAIDs yielding 335 TDs in the non-DUR group. Out of the 306 TDs in the DUR group, pharmacists intervened with a letter to the prescriber(s) on 130 TDs. Plan sponsors saved \$38.75 per-member-per-month (PMPM) in the DUR group compared to \$22.26 PMPM in the non-DUR group ( $p < 0.001$ ) with regards to NSAID prescriptions involved in the initial TD. The DUR group also had a \$21.55 PMPM day decrease in mean NSAID day supply compared to an \$18.75 PMPM day decrease in the non-DUR group.

### **CONCLUSIONS AND CLINICAL IMPLICATIONS:**

A retrospective DUR program focusing on therapeutic duplications is an effective cost savings tool to reduce costs and decrease future therapeutic duplications. These findings will show plan sponsors the benefit of a retrospective clinical program by showing how savings were improved through enrollment in the program. Although no clinical outcomes were determined based on the limited database information, a future study may incorporate medical claims or diagnosis codes to determine the clinical impact of this type of program.

Presented at the 20th Academy of Managed Care Pharmacy Annual Meeting, San Francisco, California, 2008.

## Ryan L. Steadman, PharmD



Ryan is from Cincinnati, Ohio and received his PharmD from the University of Cincinnati College of Pharmacy in 2007. His professional interests include the control of costs and trends in health care utilization. After completing his residency, Ryan hopes to continue working in the pharmacy benefit management component of managed care and to pursue a Master of Business Administration degree. When not at work, Ryan enjoys biking, hanging out with family and friends, vacationing, and attending Cincinnati Reds and Cincinnati Bengals games.

**Faculty Mentors:** Sandra Kane-Gill PharmD, MSc, Shelby L. Corman, PharmD, BCPS

## Impact of a Geriatric Palliative Care Service on Suboptimal Prescribing

### AUTHORS:

Suhrie EM, Aspinall SL, Hanlon JT, Sevick MA, Ruby CM, Jaffee E

### PURPOSE:

Currently three-fourths of older adults die either in the hospital or nursing home. Further, medication use in terminally ill patients is often suboptimal. The primary aim of this study is to determine whether a geriatric palliative care team improves suboptimal prescribing for older veteran nursing home patients.

### METHODS:

The design of the study is a retrospective case series study involving patients who were admitted to, and subsequently died on, the Geriatric Palliative Care Unit between August 1, 2005, and July 31, 2007. There was no intervention. We observed the effect of the interdisciplinary care provided by the multidisciplinary geriatric palliative care team on medication prescribing. A trained clinical pharmacist, not originally involved in the care of the patients, created a chart abstract for each patient from the most recent admission to the palliative care unit until death. Evidence

of unnecessary drug use was determined by paired clinical pharmacists using the Medication Appropriateness Index (a reliable and standardized measure) applied to information derived from the clinical abstract. Discordance among evaluators was resolved by clinical consensus conference. Unnecessary drug use was evaluated at two points in time: 1) upon transfer/admission to the palliative care unit, and 2) the last 30-day medication review prior to death. Paired t-tests were utilized to compare medication use at two points in time.

### RESULTS:

Eighty-nine patients were identified for this study. Average length of stay on the unit was 123.6 days  $\pm$  222.8. Average number of chronic medical conditions was 8.4  $\pm$  4.3. A majority of patients, 97.8%, were male and 78.7% were white. Number of scheduled medications decreased from 9.7  $\pm$  4.3 at admission to 7.4  $\pm$  3.6 at close-out with a p-value of <0.001. Number of unnecessary medications decreased from 1.7  $\pm$  1.5 at admission to 0.6  $\pm$  0.8 at close-out with a p-value of 0.003. Classes of unnecessary medications included GI, vitamins, CNS, endocrine, and antithrombotic agents. Limitations of this study include lack of control group, no evaluation of under-prescribing, and generalizability to non-VA setting.

### CONCLUSIONS AND CLINICAL IMPLICATIONS:

Based on the results of this study, it can be concluded that this geriatric palliative care unit reduces the overall number of drugs as well as the number of unnecessary drugs taken by older veteran nursing home patients. Further studies assessing suboptimal prescribing should be conducted in VA and non-VA nursing homes.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Erin M. Suhrie, PharmD



Erin is originally from Canonsburg, Pennsylvania, and received her PharmD from Ohio Northern University in 2007. Her main areas of interest are geriatrics and palliative care. Erin chose to complete a pharmacy residency at the VA Pittsburgh Healthcare System because of their palliative care program and the opportunities to work with the elderly. Erin completed her residency at VAPHS and accepted a PGY2 residency specializing in palliative care and pain management at the University of Maryland. Her career goal is to practice in both the inpatient and outpatient settings, providing pain and symptom management in alignment with patients' specific goals of care. Outside of pharmacy, Erin enjoys hiking, rollerblading, traveling (especially road trips), and Steelers football.

**Faculty Mentor:** Sherrie L. Aspinall, PharmD, MSc



## Pharmaceutical Intervention in Reducing the Risk of Inpatient Falls

### AUTHORS:

Sullivan KM, Sakely HA, Schafer JJ, D'Amico FJ

will assist in improving the established falls risk assessment processes.

### PURPOSE:

An inpatient fall can lead to injuries which lengthen hospital stay and increase overall cost. Studies have shown fall-focused medication interventions decrease the rate of falls and hospital cost. Although unit-based pharmacists at UPMC St. Margaret perform daily falls risk medication reviews, these pharmacists' impact on number of inpatient falls has not been established. Determining the outcome of pharmacists' interventions on number of falls

### METHODS:

A four-week prospective fall-focused medication review was completed by collecting a daily list of patients with a high fall risk score. A complete chart review was performed (including patient age, past medical history, admission diagnosis, vitals, labs, medications, and administration times), and interventions on any offending medications were placed in both the paper and electronic medical record. Comparison data was collected retrospectively

from existing unit-based pharmacist fall medication review documentation. A retrospective review was completed to determine the number of interventions accepted or not accepted by the physician, as defined by implementation of the intervention within 48 hours. Finally, data on any fall occurring during the study time period was collected from the UPMC St. Margaret Fall Risk Committee.

### RESULTS:

Of 194 high-risk patients reviewed by the baseline unit-based pharmacist group, 4 medication interventions were made, and 2 falls had occurred in patients where no interventions were made. Of the 4 interventions, 1 intervention was accepted by the physician. In 190 high-risk patients included in the fall-focused intervention program, 26 medication interventions were made, and 4 falls had occurred in patients where no interventions were made. Of the 26 interventions, 50% were accepted by the physician. No statistical significance was found between number of falls and pharmacist interventions for either the unit-based pharmacist group ( $p=0.959$ ) or the fall-focused intervention group ( $p=0.552$ ).

### CONCLUSIONS:

More information is needed to determine a direct impact of pharmacists' interventions on number of inpatient falls. Future process improvement initiatives may be performed on the unit-based pharmacist fall risk medication review using the fall-focused intervention process as a model to increase number of interventions and number of physician-accepted interventions.

Presented at the 27th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pennsylvania, 2008.

---

## Katherine M. Sullivan, PharmD



Katie graduated from the University of Rhode Island College of Pharmacy in 2007. Through completing her pharmacy practice residency at UPMC St. Margaret, she has strengthened her existing love for ambulatory and primary care. Next year, Katie will continue her residency experience within UPMC St. Margaret by completing a family medicine specialty with a focus in faculty development. Outside of pharmacy, Katie enjoys traveling, cooking, and spending time with her friends and family.

**Faculty Mentors:** Heather A. Sakely, PharmD, BCPS

## Impact of a Meta-Analysis Indicating Potential Safety Risks of Rosiglitazone on Physician-Prescribing Decisions

### AUTHORS:

Wisniewski CS, Corman SL

### PURPOSE:

A recently published meta-analysis indicated an increased risk of cardiovascular events in patients taking rosiglitazone versus comparator agents. The objective of this study was to determine whether this publication changed rosiglitazone prescribing, and the factors that influenced physicians' prescribing decisions.

### METHODS:

A retrospective review of prescriptions dispensed at a hospital-based outpatient pharmacy was conducted. The study compared the proportion of rosiglitazone prescriptions filled to the total number of oral antidiabetic prescriptions filled six months before and after the meta-analysis publication. Additionally, a survey was distributed to physicians at the associated hospital to evaluate their awareness of, and reactions to, the meta-analysis. Questions asked respondents to assess their familiarity with the findings, describe the

findings' impact on their prescribing, and rate factors influencing their decision.

### RESULTS:

Findings indicated a significant reduction in the prescribing of rosiglitazone when compared to the total number of oral antidiabetic prescriptions filled six months before (12.3%) and six months after (7.1%) the publication of the meta-analysis ( $p < 0.0001$ ). Survey responses ( $n=127$ ) indicated most physicians considered themselves familiar (90%) with this issue, 74% of whom answered it affected their prescribing. Inpatients not on rosiglitazone, 50% of familiar respondents stopped writing new rosiglitazone prescriptions, 46% stopped in certain patient populations, and 4% did not alter prescribing. In patients prescribed rosiglitazone, 72% of physicians stopped rosiglitazone in specific populations, while 17% stopped in all patients and 11% made no adjustments. Physicians altering prescribing indicated the meta-analysis, other published information, patient preference, and physician leadership recommendations were highly influential factors.

### CONCLUSION:

Both the retrospective review and the survey showed decreased rosiglitazone prescribing following the publication of the meta-analysis. There is an opportunity for pharmacists to improve upon their communicative role as medication and medical literature specialists.

Presented at the Spring Research and Practice Forum of the American College of Clinical Pharmacy, Phoenix, Arizona, April 2008.

---

## Christopher S. Wisniewski, PharmD



Chris received his PharmD from the Philadelphia College of Pharmacy at the University of the Sciences in Philadelphia in 2004. He completed a pharmacy practice residency at Saint Thomas Hospital in Nashville, Tennessee, and a drug information specialty residency at the University of Pittsburgh Medical Center. He has accepted a position as an assistant professor at the South Carolina College of Pharmacy, on the Medical University of South Carolina Charleston campus. Outside of pharmacy, he enjoys reading, sports, and outdoor activities.

**Faculty Mentor:** Shelby L. Corman, PharmD, BCPS



## School of Pharmacy Residency Programs

---

### Rite Aid and UPMC Falk Pharmacy: Community Care Pharmacy Practice Residency

The Community Care Pharmacy Practice Residency is a joint program offered by the University of Pittsburgh School of Pharmacy in collaboration with both Rite Aid Corporation and UPMC (University of Pittsburgh Medical Center) Falk Pharmacy. The goal of the residency program is to provide a structured, postgraduate training experience that focuses on the knowledge and skills needed to provide pharmaceutical care and develop medication therapy management practices for patients in the community setting.

The University of Pittsburgh School of Pharmacy along with our partners at the Rite Aid Corporation and UPMC Falk Pharmacy have developed a comprehensive Medication Therapy Management (MTM) Service. Pharmacists provide individualized patient care to identify, prevent, and solve drug therapy problems in collaboration with the patient's physician(s). The service is based in four, specially designed Rite Care<sup>SM</sup> Centers of Excellence in the Pittsburgh area, and at the UPMC Falk Pharmacy, an institutional outpatient pharmacy for patients and employees of the UPMC Health System. Pharmacists interview patients utilizing a standard documentation system. Pharmacists

educate the patient on their drug regimen, provide therapeutic recommendations to the patients and/or their physicians, and ensure follow-up of patient care. Pharmacists collaborate with local physicians that may include actively seeing patients in a respective physician's office. In addition to the direct patient care activities in the pharmacy, pharmacists also do community-based talks and evaluations in their local area.

The four Rite Aid Corporation-Rite Care<sup>SM</sup> Centers of Excellence in Pittsburgh and the UPMC Falk Pharmacy will serve as the primary teaching laboratories for the resident. The resident will gain patient care and management skills through active participation in the provision of medication therapy management services to patients, the development of community outreach programs, the development of collaborative relationships with medical practices in the community, and through projects with Rite Aid, UPMC, and School of Pharmacy executive teams. The resident will have a structured educational component in collaboration with School of Pharmacy faculty. The resident will also collaborate with clinical and research faculty from the University of Pittsburgh to complete a community pharmacy research project. The resident will participate in teaching student pharmacists.

**Program Director:**  
Melissa Somma McGivney, PharmD

## School of Pharmacy Residency Programs

---

### UPMC Health Plan: Managed Care Pharmacy Residency

UPMC Health Plan offers a full range of group health insurance, Medicare, CHIP, Medicaid, behavioral health, employee assistance, and workers' compensation products and services to nearly 1 million members. UPMC Health Plan has received an excellent rating for all lines of business from the National Committee for Quality Assurance.

The integration of resources from UPMC Health Plan, the University of Pittsburgh Medical Center, Community Care Behavioral Health, and the University of Pittsburgh School of Pharmacy creates a challenging environment for the resident. Residents are provided the opportunity to apply safe and effective evidenced-based medicine practices to individual patients and populations throughout the Health Plan. The Health Plan provides access to complete health management of plan members (inpatient admissions, outpatient laboratory values, diagnoses, etc.).

The training site for this residency is the UPMC Health Plan Pharmacy Services Department located in the city of Pittsburgh. The pharmacy department includes two main areas, clinical and operations. The clinical portion supports the development of pharmacy benefits for three distinct lines of business: Commercial,

Medicaid, and Medicare. The operational side of the department implements pharmacy benefits via the pharmacy benefits manager and responds to provider requests through the pharmacy call center.

The managed care resident will have the opportunity to create criteria for drug utilization reviews and evaluations, develop clinical intervention activities in conjunction with medication therapy programs, participate in Health Plan Pharmacy and Therapeutics Committee activities, and assist in formulary management and policy development in collaboration with physicians. The Health Plan develops and implements evidence-based formularies in order to provide high-quality, cost-effective medicine to its members.

The residency is affiliated with the University of Pittsburgh. Residents participate in journal clubs, present seminars, and complete a research project. In addition, residents have opportunities for teaching, research, and other scholarly activities.

The successful residents will become competent in the knowledge, skills, and attitudes required to optimize pharmacotherapy outcomes and provide a high level of patient care to diverse populations in a managed care environment.

**Program Director:** Jessica R. Daw, PharmD

## School of Pharmacy Residency Programs

---

### CVS Caremark: Managed Care Pharmacy Practice

The University of Pittsburgh and CVS Caremark, one of the nation's largest pharmacy benefit management (PBM) firms, offers an opportunity to practice in a dynamic PBM environment and gain a clinical and administrative perspective in managing pharmacy benefit plans for a wide variety of clients. The resident will be involved in multiple aspects of the PBM including clinical intervention activities, Drug Utilization Review (DUR) criteria development, disease state management, Pharmacy and Therapeutics committee activities, and clinical information systems development. In addition, the resident will also have an opportunity to obtain valuable insight about new business development, clinical account management, manufacturer contracting, and the proposals process. Academic activities, such as contributions to internal newsletters and professional journals, are encouraged. Furthermore, the resident will participate in undergraduate and graduate student instruction at the University of Pittsburgh School of Pharmacy, as well as in the development of educational programs for the CVS Caremark professional staff.

The training site for this residency program is the Clinical Operations Department of CVS

Caremark located in Pittsburgh, Pennsylvania. CVS Caremark is a chain-based pharmacy benefits management firm that provides superior prescription benefit services, along with cost-effective plan management. The company's mission is to provide innovative products and services that deliver high-quality, low-cost solutions. CVS Caremark's customer relationships are based on value, trust, and integrity.

In addition to being involved in the clinical activities of CVS Caremark, the resident will also have the opportunity to participate in the professional activities of CVS Caremark, a pioneer in the mail service pharmacy industry with advanced robotics and radio frequency dispensing technology.

**Program Director:** Julie D. Legal, PharmD

## School of Pharmacy Residency Programs

---

### UPMC Presbyterian Shadyside: Pharmacy Residency

The University of Pittsburgh Medical Center (UPMC) is the premier health system in Western Pennsylvania and one of the most renowned academic medical centers in the United States. The health system consists of tertiary, specialty and community hospitals, physician offices, and rehabilitation facilities. By integrating the resources of the University of Pittsburgh School of Pharmacy and UPMC, this residency program offers a challenging yet flexible environment where pharmacy residents learn to provide safe and effective, evidenced-based pharmacotherapy to individual patients.

Residents are actively involved in the design and completion of a residency project suitable for publication and the development and implementation of drug-use initiatives. Residents are members of multidisciplinary hospital committees, participate in journal clubs, and present seminars. Residents will have both didactic and experiential teaching opportunities at the University of Pittsburgh School of Pharmacy. Flexibility is provided to meet the individual resident's goals and objectives. Each resident is eligible for a financial stipend to attend professional meetings.

The goal of the pharmacy residency program is to gain the knowledge, skills, attitudes, and abilities necessary to independently and competently optimize pharmacotherapy outcomes through direct patient care and pharmacy practice management. Program objectives include: (1) demonstrate proficiency, confidence, and compassion in providing direct patient care to diverse populations; (2) demonstrate professionalism and effective communication skills in all components of pharmacy practice; (3) optimize pharmacotherapy and safe medication practices; (4) provide effective education to healthcare professionals; and (5) apply clinical and outcomes research concepts to professional practice.

**Program Director:** Denise R. Sokos, PharmD, BCPS

## School of Pharmacy Residency Programs

---

### UPMC St. Margaret: Pharmacy Residency

UPMC St. Margaret is a 250-bed community teaching hospital with a physician family medicine residency and fellowship program. The Pharmacy Residency at UPMC St. Margaret is ASHP accredited. This one-year, PGY1 pharmacy residency provides the resident direct patient care experiences in a variety of settings throughout the year, allowing mastery of the applications of pharmaceutical care principles to practice. The program curriculum is flexible to enable the resident to develop his or her own career interests in addition to participating in the longitudinal experiences of the residency. An opportunity to work on a casual basis in the hospital pharmacy also is available and encouraged.

The pharmacy resident will have numerous opportunities to give formal and informal presentations to healthcare professionals, precept pharmacy students, and teach at the University of Pittsburgh School of Pharmacy. A variety of practice-based research experiences exist and the resident is expected to present his or her research findings at a national pharmacy meeting.

As part of the University of Pittsburgh Pharmacy Residency Program, the residents at UPMC St. Margaret participate in resident

group seminars and journal clubs with pharmacy residents in other training programs at the University of Pittsburgh. The purpose of the residency is to train a highly motivated, team-oriented pharmacy resident in advanced patient medication management skills, teaching techniques, and practice-based research methods to prepare him or her to be a leader in the medical/academic community.

**Program Director:** Patricia M. Klatt, PharmD, BCPS  
**Assistant Director:** Roberta M. Farrah, PharmD, BCPS

## School of Pharmacy Residency Programs

---

### VA Pittsburgh Healthcare System: Pharmacy Residency

The VA Pittsburgh Healthcare System (VAPHS), in conjunction with the University of Pittsburgh School of Pharmacy, offers a PGY1 pharmacy residency program. The VAPHS has a 128-bed tertiary care facility that serves as the referral center for other VA hospitals in Pennsylvania and West Virginia, and provides a wide range of inpatient and outpatient services.

The residency provides an integrated experience in acute care, ambulatory care, drug information and practice management with an emphasis on primary care. The pharmacy residency is tailored to address the needs of the individual resident, while providing the basic foundation necessary for a high level of clinical pharmacy practice. Under the guidance of clinical faculty members at the VAPHS, each resident gains invaluable experience in balancing their schedules to provide a “real-life” approach to pharmacy practice. Each resident is involved in the drug use evaluation committee, pharmacy and therapeutics committee functions, and didactic and experiential education. Residents participate in journal club, prepare pharmacy newsletters, and provide staff and patient education. Residents are also required to complete a research project suitable for presentation and publication and to present

two seminars of interview quality to peers, faculty, students, and staff.

**Program Director:** Lauren Trilli, PharmD, BCPS

## School of Pharmacy Residency Programs

---

### UPMC Presbyterian Shadyside: Ambulatory Care Pharmacy Residency

The ambulatory care pharmacy residency at the University of Pittsburgh Medical Center (UPMC) is designed for the individual seeking to further develop skills necessary to assess, design, implement, and monitor a safe and effective evidence-based individualized medication therapy plan in a collaborative setting. The UPMC is one of the leading integrated health care delivery systems in western Pennsylvania consisting of tertiary, specialty, and community hospitals, physician offices, and rehabilitation facilities. This setting allows the ambulatory care pharmacy resident to gain experience in both institutional and community-based clinics involved in direct care of a diverse patient population. The resident is expected to become proficient in the management of diabetes, anticoagulation, hypertension, and lipid disorders. In addition, the resident will gain expertise in managing special populations such as the elderly and immunosuppressed patients.

The ambulatory care pharmacy resident is also actively involved in designing and conducting a residency project suitable for publication. Other activities include developing/implementing

drug-use initiatives, participating in resident journal clubs, and presenting two seminars. Each resident will gain experience precepting pharmacy students during their experiential rotations and leading small-group practicum sessions. Flexibility is provided to meet the individual resident's goals. The ultimate goal of the program is to enable the resident to become adept in the knowledge, skills, and attitudes required to optimize pharmacotherapy outcomes and produce proficient practitioners providing patient care to diverse populations.

**Program Director:** Deanne L. Hall, PharmD, CDE

## School of Pharmacy Residency Programs

---

### UPMC Presbyterian Shadyside: Cardiology Pharmacy Residency

The cardiology pharmacy residency at the University of Pittsburgh Medical Center (UPMC) provides residents the opportunity to develop specialized clinical expertise in the management of patients with cardiovascular disease. UPMC is the premier health system in western Pennsylvania and one of the most renowned academic medical centers in the United States. During the program, the resident will concentrate on cardiovascular patients and will be involved in ongoing department and independent research projects. Many opportunities to present formal seminars, patient cases, journal clubs, and in-service education for UPMC staff occur throughout the year. In addition, the resident will design and conduct a research project suitable for presentation and publication. The resident will gain experience in both didactic and experiential teaching at the University of Pittsburgh School of Pharmacy. At the conclusion of the program, the resident will have developed into an accomplished clinical pharmacy practitioner with expertise in cardiology, and will have gained valuable insight into the elements necessary to grow professionally.

**Program Director:** Amy L. Seybert, PharmD



## School of Pharmacy Residency Programs

---

### UPMC Presbyterian Shadyside: Critical Care Pharmacy Residency

The critical care pharmacy residency at the University of Pittsburgh Medical Center (UPMC) is designed for the individual interested in developing specialized clinical expertise in pharmaceutical care for critically ill patients. UPMC is the premier health system in Western Pennsylvania and one of the most renowned academic medical centers in the United States. The critical care pharmacy resident will gain expertise in interpretation of hemodynamic monitoring, pathophysiology of acute illness and resulting sequela, nutritional support, therapeutic drug monitoring, infusion therapy, support devices, and pharmacy practice issues of the intensive care unit.

The resident will be integrally involved in research opportunities and education of students and other healthcare professionals. Many opportunities to present formal seminars, patient cases, journal clubs, and in-service education for UPMC staff occur throughout the year. In addition, the resident will design and conduct a research project focused on critical care that is suitable for presentation and publication. The resident will gain experience in both didactic and experiential teaching at the University of Pittsburgh School of Pharmacy.

Highly motivated individuals with a strong interest in critical care who are committed to providing optimal pharmaceutical care within a team-oriented setting are encouraged to apply.

**Program Director:** Amy L. Seybert, PharmD

## School of Pharmacy Residency Programs

---

### UPMC Presbyterian Shadyside: Drug Information Residency

The University of Pittsburgh Medical Center (UPMC) is the premier health system in western Pennsylvania and one of the most renowned academic medical centers in the United States. The technologically advanced UPMC Poison and Drug Information (PDI) Center is located in close proximity to UPMC and the University of Pittsburgh School of Pharmacy.

This PGY2 drug information residency is an innovative and challenging program that will optimize the knowledge base, skills, and experience of those interested in a drug information career. Practitioners in the PDI Center provide unbiased, accurate, and comprehensive drug and poison information to health care professionals from both within and outside the UPMC.

All aspects of drug information practice will be explored during the residency program. Principles of evidence-based medicine, information retrieval and analysis, and literature evaluation are applied to formulary management. In addition, the resident will participate in pharmacovigilance programs and drug-use initiatives through the nationally

recognized Drug Use and Disease State Management Program at UPMC. The resident is an integral member of multidisciplinary hospital committees, participates in resident journal clubs, and presents seminars. Opportunities to educate students and other health care professionals exist through didactic and experiential teaching focused on drug information practices and principles. The resident is actively involved in the design and completion of a residency project suitable for presentation and publication.

**Program Director:** Shelby L. Corman, PharmD, BCPS

## School of Pharmacy Residency Programs

---

### UPMC St. Margaret: Family Medicine Residency

UPMC St. Margaret is a 250-bed community teaching hospital with a physician family medicine residency and fellowship program. This two-year pharmacy residency at UPMC St. Margaret is a program in which the resident will actually complete two residency programs. Postgraduate year one (PGY1) comprises an ASHP-accredited pharmacy residency with conditional continuation to year two (PGY2) which is a Specialty Residency in Family Medicine. The two-year experience offers the benefit of continuity of learning environment and opportunities. After building a strong foundation the first year, the resident will accomplish the establishment of an independent practice in the second year. The resident will have numerous opportunities to give formal and informal presentations to health care professionals, precept pharmacy students, and teach at the University of Pittsburgh School of Pharmacy. A variety of practice-based research experiences exist and the resident is expected to present his or her research findings at a national pharmacy meeting. The program curriculum is flexible to enable the resident to develop his or her own career interests in addition to participating in the longitudinal experiences of the residency. An opportunity to work on

a casual basis in the hospital pharmacy is also available and encouraged.

As part of the University of Pittsburgh Pharmacy Residency Program, the residents at UPMC St. Margaret participate in resident group seminars and journal clubs with pharmacy residents in other training programs at the University of Pittsburgh. The purpose of the residency is to train a highly motivated, team-orientated pharmacy resident in advanced patient medication management skills, teaching techniques, and practice-based research methods to prepare him/her to be a leader of change in the medical/academic community.

**Program Director:** Patricia M. Klatt, PharmD, BCPS

**Assistant Director:** Roberta M. Farrah, PharmD, BCPS

## School of Pharmacy Residency Programs

---

### UPMC Presbyterian Shadyside: Infectious Diseases Pharmacy Residency

The infectious diseases pharmacy residency at the University of Pittsburgh Medical Center (UPMC) is designed for the individual who is interested in developing specialized skills in infectious diseases pharmacotherapy. UPMC is the premier health system in western Pennsylvania and one of the most renowned academic medical centers in the United States. The resident will gain expertise in many aspects of pharmaceutical care including the interpretation of microbiological culture and susceptibility data, antimicrobial pharmacokinetics and pharmacodynamics, antimicrobial therapy in the general and specialized patient populations, and research. The resident will learn and practice in a multi-disciplinary environment including, but not limited to, collaboration with pharmacist practitioners and physicians from the Division of Infectious Diseases.

The resident will gain experience in both didactic and experiential teaching at the University of Pittsburgh School of Pharmacy. The education of students and other health care professionals is an integral component of this residency. In addition, the resident will complete an infectious diseases-focused

research project through participation in a mentored residency research training program. Highly motivated individuals with a strong interest in infectious diseases who are committed to providing optimal pharmaceutical care within a team-oriented setting are encouraged to apply.

**Program Director:** Brian A. Potoski, PharmD, BCPS

## School of Pharmacy Residency Programs

---

### UPMC Presbyterian Shadyside: Pharmacy Management Residency

The PGY2 pharmacy management residency at the University of Pittsburgh Medical Center (UPMC) provides opportunities for the resident to develop leadership and expert pharmacy management skills in an academic medical center. Residents will develop a strong foundation in pharmacy services management through flexible rotations in health-system and hospital pharmacy operations management, outcomes research, information technology, automation, finance, asset management, drug use management, and medication safety and education. Integration with the University of Pittsburgh School of Pharmacy will allow for interaction with faculty and students and other experiences necessary for success in an academic health system.

The resident is integrally involved in research opportunities and education of students and other healthcare professionals. Formal seminars, management cases, journal clubs, and education for UPMC pharmacy staff are mandated throughout the year. Through affiliation with the University of Pittsburgh, the resident will have didactic and experiential teaching responsibilities to PharmD candidates during their clinical clerkships. One pharmacy

management-focused research project suitable for presentation and publication is required. In addition, the clinical rotations offered in the PGY1 pharmacy residency are available as electives based on preceptor availability and resident interest.

**Program Director:** Scott M. Mark, PharmD, MS, MEd, FACHE, FASHP, FABC

## School of Pharmacy Residency Programs

---

### Upcoming PGY2 Residency Programs

UPMC Presbyterian Shadyside: Transplant Pharmacy

**Program Director:** Heather J. Johnson, PharmD, BCPS

**Assistant Director:** Michael Shullo, PharmD

University of Pittsburgh Cancer Institute/UPMC Cancer Centers: Oncology Pharmacy

**Program Director:** James Natale, PharmD

Western Psychiatric Institute and Clinic of UPMC Presbyterian Shadyside:  
Psychiatric Pharmacy

**Program Director:** Kara L. Shirley, PharmD, CGP, BCPS, BCPP

## **Residency Program Contact Information**

---

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

Kathleen Woodburn  
304 Scaife Hall  
200 Lothrop St.  
Pittsburgh, PA 15213

[www.pharmacy.pitt.edu/programs/rxresidency](http://www.pharmacy.pitt.edu/programs/rxresidency)  
[woodburnkm@upmc.edu](mailto:woodburnkm@upmc.edu)



