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2005-06



UNIVERSITY OF PITTSBURGH

School of Pharmacy  
THE ART and SCIENCE OF EXCELLENCE

*Established 1878*

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## Valuing Our Partners

The University of Pittsburgh School of Pharmacy values our partnerships with the University of Pittsburgh Medical Center (UPMC), and the VA Pittsburgh Healthcare System (VAPHS). 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 sixteen of “America’s Best Hospitals” according to the 2004 U.S. News and World Report rankings and is one of the leading integrated healthcare delivery systems in western 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.

## School Mission and Vision

The School of Pharmacy is dedicated to maximizing human health and well-being by preparing pharmacists to be lifelong learners, by providing pharmaceutical care, by developing innovative practice models, and by advancing science through cutting-edge research.

The School of Pharmacy is committed to achieving and maintaining national recognition for excellence in education, in research, and in promoting the safe, effective and science-based use of medicines and other interventions to mitigate disease and enhance the vitality and quality of human life.

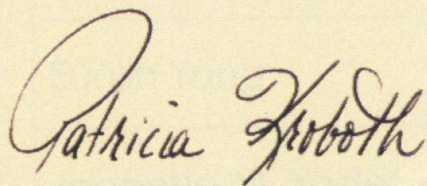
## Patricia D. Kroboth, PhD

Dear Members of the Resident Class of 2006,

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 and the VA Pittsburgh Healthcare System—have provided the rich environments for your residency experiences and learning. You have enriched each other with pharmacy backgrounds from Pennsylvania, West Virginia, Massachusetts, Florida, Nebraska, Ohio, and North Carolina.

You also have another distinction: as a class of residents, you made a commitment to learning clinical research skills through those evening research sessions. 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 upon 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

**Dennis P. Swanson, MS**

**Robert J. Weber, MS, FASHP**

This publication describes the results of the pharmacy residents' research for 2005-2006. Importantly, their work represents countless hours of commitment to learning, reading, writing, and analyzing their research. The School of Pharmacy Residency Research Program is a comprehensive course that combines didactic and group learning to teach the fundamentals of research. During this series, the residents are certified in research fundamentals through the University of Pittsburgh, develop skills in clarifying their research idea, present their ideas and methods as a group learning process, present their project in abstract form at various professional meetings, and prepare their project for peer-review publication.

We would like to recognize Dr. Randall Smith for his commitment to this year's Residency Research Program. He showed patience and respect for the residents and was always there to lend a helping hand. We would be remiss not to mention the fine secretarial support of Susan Parnell and Kathleen Woodburn. The data management skills of Melissa Saul were invaluable, and we thank her for her efforts. Finally, we have the best residents because we have the best faculty, and we thank them for their ongoing commitment to the success of the Residency Program.

# 2005–06 School of Pharmacy Residents

Name	Residency
Melissa M. Benedict	Pharmacy Practice
Jessica E. Bollinger	Pharmacy Practice
Shrina H. Duggal	Pharmacy Practice
Timothy J. George	Oncology
Brian M. Miller	Oncology
Cory A. Murray	Cardiology
Ozioma N. Ogbuokiri	Pharmacy Practice Management
Annette Sanford	Family Medicine
Casey N. Sanner	Critical Care
Patricia L. Saunders	Infectious Disease
Lauren G. Veltry	Primary Care
Eunjin Yang	Pharmacy Practice Management
Jeanette M. Yoder	Pharmacy Practice

## Melissa M. Benedict, PharmD

Pharmacy Practice Resident  
VA Pittsburgh Healthcare System



Melissa was born and raised in the South Hills area of Pittsburgh, Pa. She is a recent graduate of Duquesne University. During her last year of study, she concentrated on rotations and electives that would prepare her for a career in geriatric pharmacy. Prior to graduation, she interned at St. Clair Hospital's inpatient

pharmacy and was able to work with the clinical pharmacist. During that time, she realized that she enjoyed clinical work and decided to complete a pharmacy practice residency at the VA Pittsburgh Healthcare System. Her interests in pharmacy include geriatrics, critical care, and outpatient clinics. Melissa plans to either do a specialty residency or become involved in outpatient clinics. Also, she would like to pursue a faculty position within a school of pharmacy. Her other interests include traveling, shopping, and running.

Faculty Mentor:  
Lauren Trilli,  
PharmD, BCPS

### AUTHORS:

Benedict MM, Weisbord S, Trilli L, Del Sota M, Good C.

### PURPOSE:

Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used analgesics and are associated with potentially deleterious side effects, including acute renal failure (ARF). The presence of chronic kidney disease and concomitant use of diuretics, angiotensin-converting enzyme inhibitors (ACEI), and angiotensin receptor blockers (ARB) increase the risk for ARF from NSAIDs. Despite these well-known associations, the prevalence of NSAID use among veterans at high risk for ARF has not been evaluated.

# Assessment of Non-Steroidal Anti-Inflammatory Drug Use in Veterans at High Risk for Acute Renal Failure

## METHODS:

A retrospective chart review utilizing the VA Computerized Patient Record System (CPRS) from December 1, 2004, to August 1, 2005, was conducted. Data was taken from ten divisions within the VA Healthcare System. Approximately 7,300 patients who received NSAIDs were reviewed. Only patients who had stages 4 and 5 chronic kidney disease will be studied in depth.

## RESULTS:

There were 63 patients found to be in stage 4 chronic kidney disease and 51 patients found in stage 5 chronic kidney disease. It will be assessed if any clinical ramifications were associated with NSAID therapy in this population.

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

It is anticipated that this analysis will demonstrate that NSAID therapy should have been avoided in certain patients who were at high risk for developing acute renal failure. By making providers aware of this potential risk, it is hoped that the incidence of NSAID-associated ARF will be reduced.

Presented at the VISN 4 Pharmacy Conference, State College, Pa., 2005; the 40<sup>th</sup> Annual ASHP Midyear Clinical Meeting, Las Vegas, Nev., 2005; and the 25<sup>th</sup> Annual Eastern States Conference for Pharmacy Residents and Preceptors, Baltimore, Md., 2006.



## Jessica E. Bollinger, PharmD

Pharmacy Practice Resident  
UPMC Presbyterian Shadyside



Jessica is from Nashport, Ohio, and graduated with a PharmD from The Ohio State University in June 2005. As an intern at The Ohio State University Medical Center and through her clinical clerkship rotations, she developed an interest in critical care pharmacy. She decided to leave central Ohio to get an additional

perspective on clinical pharmacy practice. The University of Pittsburgh attracted her because of its vast opportunities to pursue research, teaching, and patient-care-related activities. Following her pharmacy practice residency, Jessica hopes to pursue a specialty residency in critical care. In her spare time, she enjoys camping, playing volleyball, watching collegiate athletics (Go Bucks!), keeping up with the independent music scene, and spending time with her family and dogs (Wiley and Rufus).

Faculty Mentor:  
Rhonda S. Rea,  
PharmD

### AUTHORS:

Bollinger JE, Coley KC, Saul M, Rea RS

### PURPOSE:

For the treatment of severe sepsis, drotrecogin alfa (activated), or recombinant human activated protein C (rhAPC) is associated with a decrease in 28-day all-cause mortality and an increased risk of serious bleeding. The Extended Evaluation of Recombinant Human Activated Protein C United States Trial (ENHANCE US) is a global, single-arm, phase-3B clinical trial that produced additional efficacy and safety data in adult patients with rhAPC. The purpose of this study is to evaluate baseline patient characteristics, 28-day all-cause mortality, and serious bleeding rates among those patients who received rhAPC at the University of Pittsburgh Medical Center (UPMC) compared to ENHANCE US.

# A Retrospective Evaluation of Outcomes in Patients Treated with Drotrecogin Alfa (activated) at an Academic Medical Center Compared to Patients Enrolled in the ENHANCE US Trial

## METHODS:

Patients were identified retrospectively from November 2001 to November 2005 through an electronic medical record data repository.

Patients who received one course of therapy of rhAPC were included.

Patient demographics, history and physicals, progress notes, discharge summaries, APACHE II scores, laboratory values, date and time of infusion of rhAPC, date of death, and transfusions of packed red blood cells were obtained. Baseline patient characteristics were assessed within 48 hours prior to the start of rhAPC. All-cause mortality was evaluated 28 days after the start of the infusion of rhAPC. Serious bleeding was monitored to day 28.

## RESULTS:

There were 136 patients included with a mean age of  $57.0 \pm 16.7$  years. Nineteen (14.0%) patients were at least seventy-five years of age. Eighty-four (61.8%) patients were male. One hundred ten (81.6%) patients were Caucasian. The mean APACHE II score was  $34.8 \pm 10.0$  at UPMC and  $23.4 \pm 7.4$  in the ENHANCE US trial ( $p < 0.001$ ). All-cause mortality at 28 days was 43.4% at UPMC and 26.4% in the ENHANCE US trial ( $p = 0.0007$ ). The rate of serious bleeding is pending final analysis.

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

The results of this study suggest that patients with severe sepsis treated with rhAPC at UPMC have a significantly higher 28-day mortality rate than patients in the ENHANCE US trial. However, patients with severe sepsis at UPMC also have a significantly higher underlying severity of illness as demonstrated by a 10-point difference in APACHE II score. An understanding of the triad of our baseline patient population, 28-day all-cause mortality rate, and serious bleeding rate in patients treated with rhAPC will be used to guide prescribers in utilization of rhAPC at our institution.

Presented at the 25<sup>th</sup> Annual Eastern States Conference for Pharmacy Residents and Preceptors, Baltimore, Md., 2006.

## Shrina H. Duggal, PharmD

Pharmacy Practice Resident  
UPMC Presbyterian Shadyside



Shrina is originally from Athens, Ohio, and received her PharmD from West Virginia University in May 2005. Her desire to broaden her clinical, research, and teaching knowledge and experience prompted her to complete a pharmacy practice residency. The residency program at the University of Pittsburgh appealed

to her because of the variety of opportunities available to the residents. Upon completion of her residency, Shrina plans to pursue a specialty residency in oncology at UPMC Shadyside. Outside of pharmacy, her interests include rollerblading, hiking, traditional Indian dancing, and spending quality time with friends and family.

Faculty Mentor:  
Rowena N. Schwartz,  
PharmD, BCOP

### AUTHORS:

Duggal SH, Schwartz RN, Somma MA

### PURPOSE:

It is presumed that individuals with cancer may have complicated and dynamic medication regimens secondary to their disease and/or treatments. As the cancer population ages, there is an increasing impact of comorbidities on medication regimens. The aim of this project is to quantify number and types of drug therapy problems and comorbid conditions and to determine the effect of age on the development of drug therapy problems in individuals with cancer at an outpatient pharmacy.

### METHODS:

Individuals with cancer or their caretakers were interviewed in an outpatient pharmacy located within a cancer center. All interviewers were oncology pharmacists trained with regard to use of the data collection form and interview

# Drug Therapy Problems in Individuals with Cancer

techniques to ensure consistency and prevent bias in the interview process. Patients or caretakers were interviewed about drug therapy problems that may have arisen in the past or were currently ongoing with regard to the patient's current medication regimen. Drug therapy problems included adverse reactions, drug-drug interactions, drug-disease interactions, inability to obtain or take medications, problems with compliance, or lack

of understanding about uses and dosing of medications.

## RESULTS:

Preliminary data analysis focused on quantity and types of drug therapy problems. In addition, information regarding demographics, comorbid conditions, number of physicians and pharmacies a patient utilizes, and patients' interests in supportive pharmacy counseling

services regarding their medication management were analyzed.

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

It is anticipated that this project will demonstrate that individuals with cancer have numerous and varied drug therapy problems. These results will be used to further support the creation of a patient-centered medication therapy management service at the outpatient cancer center pharmacy.

Age Range	40-50 n=7	50-60 n=4	60-70 n=7	70-80 n=4
Average number of meds (range)	11.7 (4-23)	7.3 (4-13)	13.6 (7-23)	10.5 (10-11)
Average number of pharmacies (range)	2.1 (1-3)	2 (2)	2.9 (2-4)	2 (2)
Average number of physicians (range)	5.4 (4-8)	4.3 (3-6)	4.9 (2-6)	4.5 (4-6)
Average number of comorbid conditions (range)	7.6 (3-11)	5.8 (3-10)	8.9 (5-14)	7.8 (7-9)
Average number of drug therapy problems (range)	3.6 (0-7)	2.3 (0-4)	5.1 (0-12)	3 (0-7)

Presented at the 25<sup>th</sup> Annual Eastern States Conference for Pharmacy Residents and Preceptors, Baltimore, Md., 2006.

## Timothy J. George, PharmD

Oncology Specialty Resident  
UPMC Presbyterian Shadyside

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Tim is originally from Wheeling, W.Va., and received his PharmD in May 2004 from West Virginia University. To enhance his clinical and academic skills, he decided to leave “Mountaineer Country” to pursue a pharmacy practice residency with the University of Pittsburgh. The residency program appealed to him because

of its wide variety of opportunities and clinical experiences. Tim completed his pharmacy practice residency in June 2005. He decided to stay on at the University of Pittsburgh to begin a clinical specialty residency in oncology. Tim’s outside interests include golfing, running, exercising, playing pool, and reading.

### **AUTHORS:**

George TJ, Schwartz RN

### **PURPOSE:**

A standard conditioning regimen for patients with multiple myeloma undergoing autologous peripheral blood stem cell transplant (Auto-PBSCT) is melphalan 200 mg/m<sup>2</sup>. Dose reduction of melphalan has been recommended for patients with impaired renal function. In clinical practice the dose of melphalan has been arbitrarily reduced in older patients, but this practice is not currently supported in the literature. The objective of this study was to determine whether dose reductions of melphalan are necessary based on age.

Faculty Mentor:  
Rowena Schwartz,  
PharmD, BCOP

# Elderly Patients with Multiple Myeloma: The Impact of Melphalan Dosing on Time to Engraftment and Toxicity Following Autologous Stem Cell Transplant

## METHODS:

Retrospective chart review and/or electronic medical record evaluations were conducted of adult patients with multiple myeloma receiving an AutoPBSCT between 2000 and 2006. The primary endpoint of mean time to engraftment was compared between two patient populations stratified according to age. Data collection also included parameters indicative of toxicities (e.g., mucositis) such as the requirement of intravenous (IV) pain medications, ability to

maintain oral (po) intake, and requirement for total parenteral nutrition (TPN).

## RESULTS:

Of the 60 patient records reviewed to date, the interim analysis includes 24 patients that met inclusion criteria. The population sample was predominantly male (66.7%). The following table depicts further interim results.

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

Mean time to engraftment appears similar between patient groups who receive full dose melphalan regardless of age. Mucositis may occur more frequently in older patients; however, its true clinical significance is yet to be determined. Further data and statistical analysis are ongoing; however, it is anticipated that this pilot project will serve as a basis to discourage arbitrary reductions in melphalan doses for AutoPBSCT conditioning regimens in elderly patients based on age alone.

Study Parameters	Age < 65 (n=14)	Age > 65 (n=10)
Primary Endpoint		
Mean time to engraftment (days)	11.9 ± 1.25	12.4 ± 2.5
Secondary Endpoints		
Patients who developed mucositis	64%	80%
Patients w/mucositis requiring IV pain medications	44.4%	50%
Patients w/mucositis unable to maintain po intake	33.3%	50%
Patients requiring TPN	0	0
Mean number red blood cell transfusions	2.21 ± 1.78	3.7 ± 3.35
Mean number platelet transfusions	2.07 ± 1.62	1.7 ± 1.73

## Brian M. Miller, PharmD

Oncology Specialty Resident  
UPMC Presbyterian Shadyside

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Brian is originally from Wheeling, W.Va., and received his PharmD from Duquesne University in 2004. He came to the University of Pittsburgh in order to gain valuable experience in clinical, teaching/precepting, and research skills. Brian completed the pharmacy practice residency in June 2005 and began a specialty

residency in oncology at UPMC Shadyside. He plans to pursue a clinical pharmacy position after finishing the specialty residency. In his leisure time, he enjoys weightlifting/exercising, participating in athletics, watching sports, and spending time with family and friends.

### **AUTHORS:**

Miller BM, Schwartz RN

### **PURPOSE:**

Over the last several years, a number of new antifungal agents have become available and have increased the prophylactic and treatment options for fungal infections. The most current Infectious Disease Society of America (IDSA) guidelines address empiric antifungal coverage during neutropenic fever, but individualized decisions and clinical judgment should play a vital role in treatment selection of available antifungal agents. There are currently no guidelines addressing drug selection for empiric antifungal therapy for patients with cancer during neutropenic febrile episodes at UPMC. This project was conducted to evaluate current clinical practice and provide the basis for development of institutional guidelines.

Faculty Mentor:

Rowena N. Schwartz,  
PharmD, BCOP

# Evaluation of Antifungal Therapy in Patients with Neutropenic Fever

## **METHODS:**

The project was a retrospective chart review (August 2005 to March 2006) of patients being empirically changed from fluconazole to a different antifungal agent. The percentage of patients with a documented reason for change in treatment, change in dose, and/or addition of another antifungal agent was determined and reported. Reasons for the change in therapy, if documented in the patient record, were also documented and evaluated based on current IDSA guidelines.

## **RESULTS:**

Of the 19 patient charts reviewed to date, there were 32 changes in antifungal agent(s). The majority of changes in drug therapy included voriconazole, caspofungin, and amphotericin B liposomal complex. In addition, one patient received posaconazole, which was investigational at the time of this review. Eighty-four percent of patients had a documented reason for changing antifungal treatment, with fever being the most common factor (47%). Fever plus a CT scan, positive cultures, renal failure, drug interactions, oxygen desaturation, sinus congestion, and a positive urine aspergillosis antigenemia were other documented reasons for therapy modification. The average number of antifungal therapy changes per patient was 1.68 (range 1–3), with the majority of changes being an alteration in agent, 6% with dose increase, and 9% having a combination of antifungals. Only 41% of the 32 changes were consistent with following with the current IDSA Guidelines.

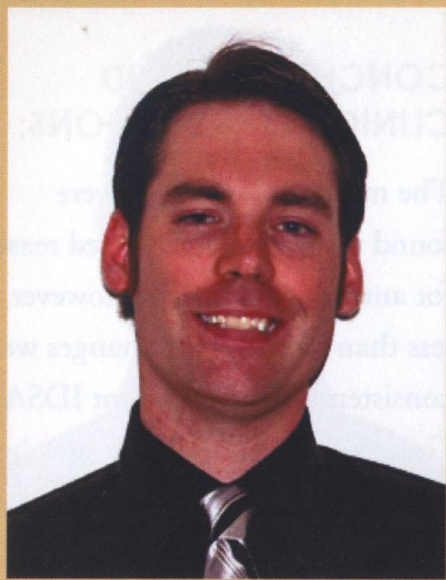
## **CONCLUSIONS AND CLINICAL IMPLICATIONS:**

The majority of patients were found to have a documented reason for antifungal changes. However, less than half of these changes were consistent with the current IDSA Guidelines. This data can now be utilized to develop a new protocol at this institution for utilizing antifungal agents in prolonged neutropenic fever based upon the IDSA Guidelines and clinical experience.



## Cory A. Murray, PharmD

Cardiology Specialty Resident  
UPMC Presbyterian Shadyside



Cory is originally from Ellwood City, a small town located north of Pittsburgh. He received his PharmD from Duquesne University in May 2004 and immediately began a pharmacy practice residency at the University of Pittsburgh. After completing that program, he continued in

the residency program as a specialty resident in cardiology. Upon completing his specialty residency, Cory hopes to work closely in a clinical environment with physicians, nurses, and other healthcare professionals to provide optimal pharmaceutical care and education to patients. In addition, he hopes to balance his clinical interests in cardiology with those of teaching by becoming a clinical faculty member at a school of pharmacy.

Faculty Mentor:  
Amy L. Seybert,  
PharmD

### AUTHORS:

Murray CA, Seybert AL

### PURPOSE:

To assess clinical pharmacotherapy skills of fourth-year student pharmacists before and after exposure to simulation-based learning (SBL).

# Assessment of Simulation-Based Learning (SBL) in Fourth-year Pharmacy Students while on an Experiential Rotation

## METHODS:

Students on experiential rotation were divided into intervention (SBL) and control (no SBL) groups. A face-validated survey and test at the beginning and end of the rotation assessed clinical skills and knowledge. Scores were reported as percent (%) and percentage (%) correct, respectively. Control and intervention group test scores were compared using an independent t-test while both intervention and control test scores pre- and post-rotation were compared using paired t-test.

## RESULTS:

The intervention group included 22 fourth-year students, with 20 as controls. Survey scores regarding clinical confidence and effects of SBL on knowledge and skills improved from baseline in the intervention group. Minimal or no improvement was noted in control group. Intervention group pre- and post-rotation test scores were 42% and 70% ( $p < 0.05$ ), while control group test scores were 43% and 46% ( $p = 0.48$ ) respectively. No difference in pre-rotation test scores was noted between groups ( $p = 0.79$ ). Comparison of post-rotation test scores between groups indicated a significant difference favoring the intervention group ( $p < 0.05$ ).

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

Intervention student post-rotation test scores improved after SBL when compared to a control group and baseline. SBL provides an innovative learning technique that improves knowledge and clinical performance of student pharmacists in a safe practice environment.

## Ozioma N. Ogbuokiri, PharmD

Pharmacy Practice Management Resident  
UPMC Presbyterian Shadyside



Ozioma grew up in Willingboro, N.J. She received her PharmD from Northeastern University in May 2004. She then completed a pharmacy practice residency at Children's National Medical Center in Washington, D.C. Her clinical interest is in pediatrics. As a pharmacy management resident, her goal was to continue

to develop her leadership and management skills. After this residency, Ozioma plans to pursue a management position in a pediatric institution and teach. During what little time she has outside of pharmacy, she enjoys reading and shopping.

Faculty Mentor:  
Robert J. Weber,  
MS, FASHP

### AUTHORS:

Ogbuokiri ON, Weber RJ, Handler S, Mark SM

### PURPOSE:

UPMC recently implemented bar-coded medication administration (BCMA) as a patient-safety initiative. Evaluating the true value and impact of new technology is essential in improving efforts to decrease medication errors. BCMA has been proven to decrease medication errors. While adverse drug events (ADEs) can result from medication errors, it is unclear whether BCMA prevents ADEs. The objective of this study was to determine the percentage of intercepted errors identified by BCMA that have the potential to cause an ADE and to identify classes of medications involved in intercepted errors and potential adverse drug events (PADE).

# Analysis of Intercepted Medication Errors Identified by a Bar-Code Medication Administration System

## METHODS:

This study was a retrospective review of intercepted medication errors generated by the BCMA system based on alerts fired at the time of administration. Following a preliminary review to eliminate false positives, approximately 100 intercepted medication errors were reviewed to determine the probability of causing an ADE. A multidisciplinary expert panel consisting of a pharmacist, a physician, and a nurse was assembled using members of the ADE subcommittee at UPMC. A de-identified case report was prepared for expert panel review and included pertinent patient information within 24 hours of the date the medication error was prevented. The expert panel then determined by consensus if an ADE would have occurred had the medication been given. PADEs were defined according to literature definitions and were then classified as the potential to cause harm due to: 1) serious drug interaction; 2) allergy; 3) duplicate therapy; 4) contraindicated therapy; 5)

inappropriate dose; and 6) no indication. The statistical analysis will include calculating the kappa coefficient to determine inter-rater reliability based on independent expert panel review.

## RESULTS:

Out of 100 intercepted errors reviewed, 69% were identified as PADEs. Anti-infectives, opioids, cardiovascular agents, and glyce-mic agents were associated with 73% of PADEs. These results mirror national and regional data that show that these classes of drugs are most likely to cause harm when an error occurs. Other medication classes associated with PADEs were vitamins, minerals, and electrolyte supplements (13%), anti-emetics (4%), and sedative/hypnotic agents (3%). Out of 69 PADEs, 63% were classified as duplicate therapy, followed by no indication (30%), inappropriate dose (10%), allergy (9%), contraindication (5%), and drug interaction (3%).

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

The BCMA system implemented at UPMC has the potential to prevent serious ADEs. The results of this study serve as a starting point for evaluating the effectiveness of BCMA, determining the root causes for intercepted medication errors, and the optimizing the utility of the administration alerts associated with the system.

Presented at the 25<sup>th</sup> Annual Eastern States Conference for Pharmacy Residents and Preceptors, Baltimore, Md., 2006.

# Annette Sanford, PharmD

Family Medicine Resident  
UPMC St. Margaret



Annette received her PharmD from Lake Erie College of Osteopathic Medicine (LECOM) School of Pharmacy in Erie, Pa., in June 2005. Although new to pharmacy, she is not new to medicine as she is also a registered nurse. Through her residency in family medicine, Annette hopes to develop a strong clinical and

academic background. She chose the University of Pittsburgh because of its strong commitment to education and collaborative approach to patient care. She enjoys camping, swimming, and spending time with her family and friends.

## **AUTHORS:**

Sanford A, Skledar SJ

## **PURPOSE:**

Lawrenceville Family Health Center (LFHC) has had a Free Medicine Program in operation for 18 months. To date, there has been no formal assessment of the program. The aim of the project was to estimate the rate of refill pickup and identify differences in specific characteristics between patients who pick up and do not pick up prescriptions.

## **Faculty Mentors:**

Frank D'Amico, PhD

Roberta M. Farrah,  
PharmD, BCPS

# Systems Approach to Improving the Rate of Free Prescription Pickup

## METHODS:

This quality improvement project was approved by the hospital Total Quality and Patient Safety Committee in December 2005. A single-center study performed at LFHC prospectively followed new patients to initially gather baseline data to determine the number of enrollees, rate of patient prescription pickup and the time takes for them to return for their refill. A process improvement was undertaken by a multidisciplinary team to identify causes of poor prescription pickup rates and to increase the percent of free prescription pick-up from LFHC.

## RESULTS:

Baseline data collection revealed that 15%–30% of patients return to pick up medications within a one-month period. The process improvement revealed that 50% of the poor prescription pickup problem was related to no consistent process for patient re-notification. The improvement cycle objective was to implement a new patient notification process whereby the patient is notified via telephone the first week by the pharmacy intern and by phone or letter by the pharmacy resident. Outcome measures were obtained through weekly sampling of the specified medication location and by dividing the number of patient prescriptions picked up per week by the number of patient prescriptions available for pickup. Weekly data collection started November 1 and continued to March 30, 2006. A total of 106 were enrolled in the quality improvement project. Patients were given four months to pickup their prescriptions. The mean time of pickup was 2.9 weeks, median time two weeks, and the rate of pickup

was ninety-two percent (97/106). Four prescriptions remained in the drawer at the end of the study, and five prescriptions were censored (removed from the drawer and returned to stock).

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

The next phase of the study will identify barriers that may have affected the pickup rate. This process improvement increased prescription pickup rates from 30% to 92%, with the majority of prescriptions being picked up within one to two weeks over the course of one month. Telephone and written notification was successful in increasing patient prescription pickup in a timely fashion.

Presented at the 25<sup>th</sup> Annual Eastern States Conference for Pharmacy Residents and Preceptors, Baltimore, Md., 2006.

## Casey N. Sanner, PharmD

Critical Care Specialty Resident  
UPMC Presbyterian Shadyside

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Casey is originally from Erie, Pa., and is the critical care/ cardiology specialty resident at UPMC Presbyterian. He received his PharmD from Duquesne University and also completed the certificate program in pharmacy administration at Duquesne. Casey went on to complete a pharmacy practice residency at

Hamot Medical Center in Erie, Pa. There he became very interested in cardiology and critical care medicine, specifically in the areas of heart failure, sepsis, and clinical pharmacy's impact on patient care. He plans to pursue a faculty/clinical position at a major teaching hospital. Outside of work, he enjoys traveling and golf.

### AUTHORS:

Sanner CN, Falcione B, Benedict N, Donahoe M, Rea RS

### PURPOSE:

To evaluate a pharmacist-initiated protocol and recommendation for the treatment of severe sepsis with recombinant human Activated Protein C (rhAPC) in patients with this diagnosis who meet University of Pittsburgh Medical Center Presbyterian (UPMC-P) Pharmacy and Therapeutics Committee (P&T) guidelines for rhAPC.

Faculty Mentor:  
Rhonda S. Rea,  
PharmD

# Pharmacist Initiated Screening for Severe Sepsis and the Impact on Proper Utilization of Recombinant Human Activated Protein C (drotrecogin)

## METHODS:

This was a prospective study of all patients admitted to either of two physician teams in the UPMC-P medical intensive care unit (MICU). Enrollment took place between January 31, 2006, and April 28, 2006. Adult patients admitted to the MICU were screened in the first 24 hours of admission to determine if they met P&T criteria for rhAPC. A critical-care pharmacist participating in multidisciplinary rounds on one of the two MICU physician teams actively made recommendations for rhAPC treatment when the patients met P&T criteria. Patients on the physician-only team served as the control group; they were screened by a pharmacist but no active recommendations for treatment were made. The control patients could receive the drug if the physicians assessed the patient themselves and P&T criteria for treatment were met. The primary outcome was the number of patients treated with rhAPC in the pharmacist vs. physician-only (control) team.

## RESULTS:

One-hundred and eighty-three patients were screened for severe sepsis during the study period. Twenty five patients (14%) met criteria for treatment with rhAPC with no contraindications to treatment: 14/25 (56%) in the pharmacist group and 11/25 (44%) in the control group. Four patients (29%) in the pharmacist group received treatment with rhAPC, versus zero in the control group. The secondary outcome is to evaluate the reasons why physicians do not prescribe rhAPC in patients who meet criteria for treatment. Physicians' responses to why rhAPC was not used in patients who met criteria for the drug are currently under evaluation.

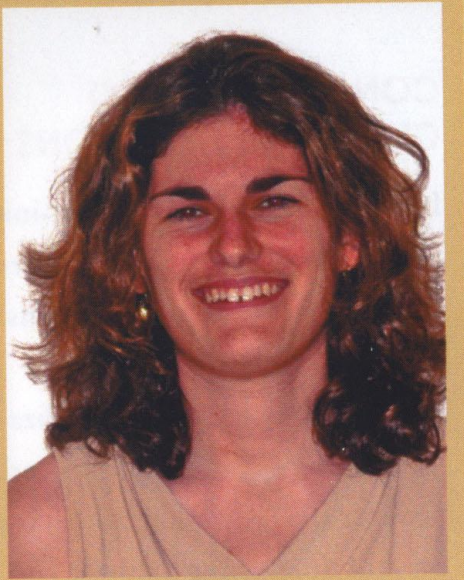
## CONCLUSIONS AND CLINICAL IMPLICATIONS:

In this analysis, a pharmacist-initiated protocol and recommendation for the treatment of severe sepsis with rhAPC did not promote a significant increase in the utilization of rhAPC. Physician attitudes towards the utilization of the drug are still undergoing analysis.



## Patricia L. Saunders, PharmD

Infectious Disease Specialty Resident  
UPMC Presbyterian Shadyside



Patricia Saunders is originally from Buenos Aires, Argentina, but spent most of her life in Florida. She earned her PharmD at the University of Florida in 2004. She then continued her education by completing a pharmacy practice residency at Hartford Hospital in Hartford, Conn. During clinical rotations

at the University of Florida and then at Hartford Hospital, Patricia developed a strong interest in infectious diseases and decided to pursue an infectious disease specialty residency at the University of Pittsburgh. During this residency, she hopes to gain clinical experience in the various areas of infectious diseases as well as research and teaching skills.

Faculty Mentor:  
Brian A. Potoski,  
PharmD

### AUTHORS:

Saunders PL, Capitano B, Paterson DL, Potoski BA

### PURPOSE:

A criticism of antibiotic management programs that require prospective antibiotic approval is that they may delay the patient's receipt of antibiotic therapy through impedance of the medication ordering process. However, it can be postulated that such a delay occurs only when the prescriber is non-compliant with the procedure, thus necessitating an additional pharmacist intervention. The objective of this study was to determine the impact of prescriber non-compliance to the antibiotic management program (AMP) procedure on the medication ordering process time.

# Does Prescriber Compliance with Prospective Approval Procedure of an Antibiotic Management Program Affect Medication Ordering Process Time?

## **METHODS:**

Antibiotic orders were collected in the central pharmacies of the two academic medical centers where the AMP currently operates. Orders received by the pharmacy with an approval number indicate prescriber compliance with the prospective antibiotic approval procedure. Orders received without an approval number denote prescriber non-compliance with the procedure. The medication ordering process time was measured based on the following: the time the medication order is received by the pharmacist, the time needed to contact the physician regarding antibiotic approval, the time needed for the AMP approval call, and the time the antibiotic is entered into the pharmacy system. The average time of the medication ordering process for antibiotics ordered by compliant prescribers was compared to that of non-compliant prescribers.

## **RESULTS:**

In this observational study of a sample of 156 antimicrobial orders, we found that prescriber non-compliance with antimicrobial pre-approval significantly lengthened the medication ordering process time (2.87 vs. 74.22 minutes,  $p < 0.0001$ ). Between January and April 2006, we collected 72 orders with approval numbers and 84 without approval numbers, of which 72 were included in the comparison analysis. When the average length of the AMP call was added to the medication ordering process time of compliance orders and compared to the time for non-compliance orders, a significant difference was still found (5.38 vs. 74.22 minutes,  $p < 0.0001$ ). There was no significant difference in medication ordering process time between day and evening shifts.

## **CONCLUSIONS AND CLINICAL IMPLICATIONS:**

Prescriber non-compliance with the AMP prospective approval process significantly lengthened the medication ordering process time. Even though orders were not matched to the corresponding calls, this study showed how the order-entry process is delayed when a prescriber does not follow antimicrobial pre-approval procedure.

Presented at the ACCP Spring Practice and Research Forum, Monterey, Calif., 2006; and Making a Difference in Infectious Diseases Pharmacotherapy (MAD-ID), Orlando, Fla., 2006.

## Lauren G. Veltry, PharmD

Primary Care Specialty Resident  
UPMC Presbyterian Shadyside



Lauren is originally from Barboursville, W.Va., and she graduated with a PharmD from West Virginia University in 2004. After graduation, she chose to pursue a pharmacy practice residency at the Lexington VA Medical Center in Lexington, Ky. Both her rotations and her residency fueled Lauren's interest

in primary care. Her outside interests include traveling, reading, cooking, and shopping, though not necessarily in that order.

Faculty Mentor:  
Deanne L. Hall,  
PharmD

### AUTHORS:

Veltry LG, Hall DL, Schonder KS

### PURPOSE:

In July 2004, approved alterations to the enoxaparin package insert included dosage recommendations for patients with severe renal impairment, defined as creatinine clearance (CrCl)  $< 30\text{mL}/\text{min}/1.73\text{m}^2$ . No specific recommendations were made for patients with mild to moderate renal impairment (CrCl 30-60mL/min), thus promoting the use of standard dosing in this population. The purpose of this study is to correlate enoxaparin doses and incidence of major bleeding in patients with renal dysfunction, defined as a glomerular filtration rate (GFR)  $\leq 60\text{mL}/\text{min}/1.73\text{m}^2$ .

# Enoxaparin Dosing and Incidence of Bleeding in Patients with Renal Dysfunction

## METHODS:

This was a retrospective evaluation of electronic medical records to identify patients with a calculated  $\text{GFR} \leq 60\text{mL}/\text{min}/1.73\text{m}^2$  who received at least two consecutive doses of enoxaparin from July 1, 2004, through August 31, 2005. Patients were stratified into two groups:  $\text{GFR } 30\text{-}60\text{mL}/\text{min}/1.73\text{m}^2$  and  $< 30\text{mL}/\text{min}/1.73\text{m}^2$ . Incidences of bleeding will be identified by ICD-9 CM codes and changes in lab values consistent with bleeding. The bleeding rates of regimens with standard dosing recommendations were compared to the rates of regimens with deviations in dosages recommended from the package insert.

## RESULTS:

Approximately 350 patients with a  $\text{GFR} < 60\text{mL}/\text{min}/1.73\text{m}^2$  were identified as having received at least two consecutive doses of enoxaparin during the specified time frame. Bleeding incidences will be evaluated for each group and will be correlated with enoxaparin dose.

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

This information will be used to improve education and recommendations for enoxaparin dosing in patients with renal dysfunction.

## Eunjin Yang, PharmD

Pharmacy Practice Management Resident  
UPMC Presbyterian Shadyside



Eunjin obtained her BS in pharmacy from Kyung Hee University in Seoul, Korea, and her PharmD from Creighton University, located in Nebraska. She worked as a clinical pharmacist at Johns Hopkins Hospital in Baltimore, Md., and was a clinical manager at Bayhealth Medical Center

in Dover, Del. Eunjin's resident project is to determine pharmacy outcomes and measure the impact of pharmacist involvement in medication education. She enjoys hiking and shopping.

Faculty Mentor:  
Amy C. Donihi,  
PharmD, BCPS

### AUTHORS:

Yang E, Donihi AC, Weber RJ,  
Mark SM

### PURPOSE:

At UPMC, hospitalized patients prescribed 10 or more oral medications are provided medication education by an Education Pharmacist. This study was conducted to assess whether patient ability to recall medication information after hospital discharge is affected by the timing of education during hospitalization.

# Optimal Scheduling of Medication Education for Hospitalized Patients

## METHODS:

For a 10-week period, all patients who received medication education from an Education Pharmacist and who were discharged to home were included. Patients discharged more than 14 days after education, those for whom education was directed to the caregiver, and those who routinely see an outpatient clinical pharmacist were excluded. Included patients were called 48 to 72 hours following hospital discharge and asked to participate in a survey to test their recall of name, indication, dose/frequency and side effects of two medications that the Education Pharmacist reviewed with them. These two medications were selected because they were ones focused on during the session. Answers were recorded and will be analyzed according to each measurement versus the number of days between the time of education and discharge.

## RESULTS:

Among 285 patients educated during the study period, 212 patients met criteria and 100 patients participated in the survey. The percentages of patients who could tell at least one correct indication, name, dose, and side effect were approximately 90%, 85%, 80%, and 35% respectively when the education was provided 2–3 days before discharge. This was about 10% to 20% higher than the patients who received the education on the day of discharge and slightly higher than the patients educated on the other days. The differences are not statistically significant. Correct recall rates for frequency were similar (85% or 90%) between the patients groups. Males, those older than 55 years, and those not recalling the pharmacist tended to have worse recall.

## CONCLUSIONS AND CLINICAL IMPLICATIONS:

Patients educated 2–3 days prior to hospital discharge had slightly better recall. Since patients didn't recall better on day of discharge, it may not be necessary to wait to counsel patients until the day of discharge.

Presented at the 25<sup>th</sup> Annual Eastern States Conference for Pharmacy Residents and Preceptors, Baltimore, Md., 2006.

## Jeanette M. Yoder, PharmD

Pharmacy Practice Resident  
VA Pittsburgh Healthcare System



Jeanette graduated from Campbell University School of Pharmacy, located in Buies Creek, N.C., in 2005. She decided to come to Pittsburgh after meeting some of the pharmacists from the VA Pittsburgh Healthcare System at the ASHP Midyear Meeting last year in Orlando.

Her main interests are geriatrics

and pharmacist-run clinics, so the VA was a perfect fit. When she completes her pharmacy practice residency, Jeanette hopes to pursue a career in the clinic setting. She would like to help manage drug therapies for patients with hyperlipidemia, hypertension, diabetes, and clotting disorders. She enjoys singing, traveling, and visiting friends and family.

Faculty Mentor:  
Lauren Trilli,  
PharmD, BCPS

### **AUTHORS:**

Yoder JM, Trilli L

### **PURPOSE:**

Recombinant human erythropoietin is a costly medication that has high potential for inappropriate use and monitoring. At the VAPHS, a drug-use evaluation of patients receiving erythropoietin showed that only 18% had a complete anemia workup prior to initiation of erythropoietin. In addition, 6% of patients had a baseline hemoglobin that was already at goal ( $>11\text{g/dL}$ ) and therefore had no indication for erythropoietin. Inappropriate screening may lead to the use of erythropoietin in patients who have no indication for the drug. Inappropriate laboratory monitoring after the medication is initiated may lead to inadequate dose titration and drug failure. In addition, patients may be continued on an expensive medication with potential adverse effects when erythropoietin therapy is no longer indicated. The purpose of this quality improvement project is to

# Implementation of Erythropoietin Guidelines for Use at the Veterans Affairs Pittsburgh Healthcare System (VAPHS)

implement dosing and monitoring guidelines for the use of erythropoietin at VAPHS.

## **METHODS:**

Guidelines for the use of erythropoietin at VAPHS have been developed and a drug-ordering template that encompasses the recommendations for dosing and monitoring of erythropoietin is currently under development. After the template is implemented, hemoglobin values will be recorded using the VA's Computerized Patient Record System (CPRS). The percentage of patients with a goal hemoglobin level will be compared before implementation of the guidelines and 12 weeks post-implementation. This time frame was chosen because it provides adequate time for patients initiated on the medication to achieve maximal benefit if appropriate dosage adjustments are performed. Drug acquisition costs will also be compared before and after implementation of the guidelines.

## **RESULTS:**

The results of this study are pending. It is anticipated that a higher percentage of patients will achieve a goal hemoglobin of  $>11\text{g/dL}$  after the implementation of erythropoietin guidelines due to increased provider awareness of dosing and monitoring recommendations. At this time, it is difficult to anticipate the impact of the guidelines on drug acquisition costs. It is possible that they could decrease if there are a significant number of patients in which erythropoietin therapy is discontinued. Alternatively, drug acquisition costs may increase if providers' awareness of dosage recommendations leads to utilization of higher doses of erythropoietin.

## **CONCLUSIONS AND CLINICAL IMPLICATIONS:**

The goal of implementing guidelines for erythropoietin is to increase provider awareness of recommendations for dosing and monitoring in order to promote maximal efficacy and safety of patients treated with erythropoietin at VAPHS.



## **Children's Hospital of Pittsburgh: Pediatric Pharmacy Practice Residency**

The Children's Hospital of Pittsburgh (CHP), in conjunction with the University of Pittsburgh, offers a residency program specializing in pediatric pharmacy practice. This residency is designed to develop and enhance the knowledge, skills, and attitudes necessary for providing quality clinical pharmacy services to pediatric patients. Rotation opportunities include general pediatrics, neonatal intensive care, pediatric intensive care, cardiology, hematology/oncology, transplantation, ambulatory care (longitudinal), infectious disease and drug information. Elective rotations may be designed based on availability and resident interest. The resident will be responsible for providing clinical services in addition to clinical and didactic teaching, completion of a research project, participation in the clinical on-call therapeutic drug monitoring (TDM) service, and other departmental activities. Children's Hospital of Pittsburgh is dedicated to improving the health and well-being of all children through excellence in patient care, teaching, and research.

CHP will be opening a new state-of-the-art facility in 2007. It will be one of the first hospitals in the nation incorporating environmentally "green" technology. Plans for this 1.45 million square foot facility call for three parking garages, two helipads, 14 operating rooms, 41 ER exam rooms, 235 inpatient beds including 28 NICU and 48 critical care. As the only hospital in western Pennsylvania devoted solely to the care of infants, children and young adults, CHP has been named consistently to several elite lists of pediatric healthcare facilities, including ranking seventh among children's hospitals (FY 2002) in funding provided by the National Institutes of Health. The hospital also is renowned for cardiology, cardiothoracic surgery, critical care medicine, diabetes, hematology/oncology, neurosurgery, organ and tissue transplantation, orthopaedics, otolaryngology (ENT), and pediatric surgery. CHP is also the only accredited Level 1 Regional Resource Pediatric Trauma Center in western Pennsylvania and one of only three in the state.

**Program Director: Amy Potts, PharmD**

## **PharmaCare: Pharmacy Benefits Management Residency**

The University of Pittsburgh and PharmaCare Management Services, Inc., 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 Drug Utilization Review (DUR) criteria development, clinical intervention activities, 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, client service and marketing support. Academic activities, such as contributions to internal newsletters and professional journals, are encouraged. Furthermore, the resident will participate in undergraduate and graduate student instruction, as well as in the development of educational programs for the PharmaCare professional staff.

The training site for this residency program is the Clinical Department of PharmaCare located in Pittsburgh, Pa. PharmaCare 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. PharmaCare's customer relationships are based on value, trust and integrity.

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

Program Director: Julie Legal, PharmD

**Rite Aid:  
Community Care Pharmacy Practice Residency**

The community care pharmacy practice residency is a joint program offered by the University of Pittsburgh School of Pharmacy and Rite Aid Corporation. 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 and the Rite Aid Corporation have partnered to develop a comprehensive medication therapy management (MTM) service, Rite Care<sup>SM</sup>. 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, Pa., area. Using a standard software documentation system, pharmacists interview patients. Pharmacists educate patients 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, which 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 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 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 hold a clinical instructor position at the University of Pittsburgh School of Pharmacy and participate in teaching pharmacy students.

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

## **UPMC Presbyterian Shadyside: Cardiology Specialty Residency**

The cardiology residency provides opportunities for a resident to enhance his/her clinical skills while becoming exposed to the functions of health system and academic institutions. In addition, the resident will experience both didactic and experiential teaching opportunities as an adjunct instructor and preceptor within the University of Pittsburgh School of Pharmacy. The resident will concentrate on cardiovascular patients and projects and will be involved in ongoing department and independent research projects. The resident will have the opportunity to develop and present a research project and a formal seminar, and will participate in discussion series and formal department programs. At the conclusion of the program, the resident will have developed into an accomplished clinical practitioner, with an emphasis in cardiology, who has gained valuable insight into the elements necessary to grow and develop professionally.

Program Director: Amy L. Seybert, PharmD

## **UPMC Presbyterian Shadyside: Critical Care Specialty Residency**

The critical care residency at UPMC Presbyterian hospital is designed for the individual interested in developing specialized clinical expertise in pharmaceutical care for critically ill patients. The critical care 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. Formal seminars, patient cases, journal clubs, and inservice education for UPMC staff are mandated throughout the year. Through affiliation with the University of Pittsburgh, the resident holds an adjunct instructor position with didactic and experiential teaching responsibilities to PharmD candidates during their clinical clerkships.

Program Director: Amy L. Seybert, PharmD

**UPMC St. Margaret:  
Pharmacy Practice/Family Medicine Residency**

UPMC St. Margaret is a 250-bed community teaching hospital with a medical family medicine residency and fellowship program. The pharmacy practice, family medicine residency at UPMC St. Margaret is a two-year program: year one comprises a pharmacy practice residency, and year two is a specialty residency in family medicine. The 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. 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.

Director: Patricia Klatt, PharmD, BCPS

Assistant Director: Roberta Farrah, PharmD, BCPS

## **UPMC Presbyterian Shadyside: Infectious Disease Pharmacy Residency**

The infectious disease specialty residency at the University of Pittsburgh Medical Center (UPMC) is designed for the individual who is interested in developing specialized clinical skills in the area of infectious diseases pharmacotherapy. The infectious disease specialty resident will gain expertise in many aspects of pharmaceutical care including, but not limited to, the interpretation of microbiological culture and susceptibility data, antimicrobial pharmacokinetics/pharmacodynamics, antimicrobial therapy in the general as well as specialized patient populations and research.

The resident will be integrally involved in research opportunities and the education of students and other healthcare professionals. The resident will work in close collaboration with not only pharmacist practitioners but physicians of the Division of Infectious Diseases. Through affiliation with the University of Pittsburgh, the resident will hold didactic and experiential teaching responsibilities to Doctor of Pharmacy candidates. The resident will also complete an infectious disease research project through participation in a mentored residency research training program.

Program Co-Director: Blair Capitano, PharmD

Program Co-Director: Brian Potoski, PharmD

**UPMC Presbyterian Shadyside:  
Oncology Specialty Residency**

The University of Pittsburgh Cancer Institute (UPCI) and the University of Pittsburgh Cancer Centers are part of the University of Pittsburgh Medical Center (UPMC) that serves patients with hematologic and oncologic diseases. Disease-focused centers within the UPCI include a world-renowned melanoma center, as well as centers devoted to brain tumors, breast cancer, colon and gastrointestinal cancer, head and neck cancer, leukemia and lymphoma, liver cancer, lung cancer, oral cancer, ovarian and gynecologic cancers, prostate and urologic cancers, and stem-cell transplantation.

The oncology residency at the UPCI is designed for clinical pharmacists interested in specializing in the pharmaceutical care of patients with cancer. The oncology resident will gain expertise in the management of various malignant solid tumors, lymphomas, leukemias, as well as the management of patients receiving autologous and allogeneic stem cell transplants. The resident will also be involved in the provision of supportive care to patients with cancer including, but not limited to, pain management, nutrition, and hospice care. A wide variety of teaching opportunities is available; including one-on-one teaching of Doctor of Pharmacy students, formal large and small group teaching in courses at the School of Pharmacy and the UPMC Cancer Centers, and informal in-services throughout UPMC.

Program Director: Rowena Schwartz, PharmD, BCOP

## **UPMC Presbyterian Shadyside: Pharmacy Practice Residency**

The University of Pittsburgh Medical Center (UPMC) is ranked among the top sixteen of “America’s Best Hospitals” according to the 2004 U.S. News and World Report rankings and is one of the leading integrated health-care delivery systems in western Pennsylvania. 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 Presbyterian Shadyside, this residency program offers a challenging yet flexible environment where highly motivated pharmacy residents may ensure the application of safe and effective, evidenced-based medicine practices to individual patients and in populations throughout the Health System.

Residents are actively involved in the design and participation 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 resident journal clubs, and present seminars. A unique aspect of this program is that each resident holds an adjunct instructor position with opportunities to prepare lectures for pharmacy and allied health students, lead student group discussions, and precept PharmD students during their clerkship rotations. Flexibility is provided to meet the individual resident’s goals and objectives. Each resident will be eligible for a financial stipend to attend professional meetings. The ultimate goal of the program is to enable residents to become competent in the knowledge, skills, and attitudes required to optimize pharmacotherapy outcomes and provide a high level of patient care to diverse populations.

Program Director: Denise Sokos, PharmD, BCPS



### **UPMC Presbyterian Shadyside: Pharmacy Practice Management Residency**

The pharmacy practice 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. Specific rotations and competencies include departmental administration (including P&T Committee and drug information services), health system and hospital operations management, pharmacoinformatics and outcomes research, drug use and disease state management, pharmacy automation, finance and information services.

The resident will be integrally involved in research opportunities and education of students and other health-care professionals. Formal seminars, patient 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 research project focused on pharmacy practice management, suitable for publication or presentation at a national meeting, is required.

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

## **UPMC Presbyterian Shadyside: Primary Care Specialty Residency**

The University of Pittsburgh Medical Center (UPMC) is ranked among the top sixteen of “America’s Best Hospitals” according to the U.S. News and World Report rankings and is one of the leading integrated healthcare delivery systems in western Pennsylvania. 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 highly motivated primary care specialty residents may ensure the application of safe and effective, evidenced-based medicine practices to individual patients and in populations throughout western Pennsylvania.

In addition, residents are actively involved in the design and participation of a residency project suitable for publication, development and implementation of drug-use initiatives, as members on multidisciplinary hospital committees, and as participants in resident journal clubs and seminar. Unique to this program, each resident holds an Adjunct Instructor position with opportunities to prepare lectures for pharmacy and allied health students, lead student group discussions, and directly precept PharmD students during their clerkship rotations. Flexibility is provided to meet the individual resident’s goals and objectives. Each resident will be eligible for a financial stipend to attend professional meetings. The ultimate goal of the program is to enable primary care specialty residents to become competent in the knowledge, skills, and attitudes required to optimize pharmacotherapy outcomes and produce proficient practitioners providing patient care to diverse populations.

Program Director: Deanne Hall, PharmD

### **UPMC Drug Information Center: Drug Information Residency**

The University of Pittsburgh Medical Center (UPMC) is one of the leading integrated healthcare delivery systems in western Pennsylvania. The technologically advanced UPMC Drug Information (DI) Center is located in close proximity to UPMC and the University of Pittsburgh School of Pharmacy. This specialty residency in drug information presents an innovative and challenging program to help optimize the knowledge base, skills, and experience of those interested in a drug information career. Practitioners in the DI Center provide unbiased, accurate, and comprehensive drug information to healthcare professionals both within and outside UPMC.

All aspects of DI practice will be explored during the one-year residency. Principles of evidence-based medicine, information retrieval and analysis, and literature evaluation are applied to formulary management, pharmacovigilance, and initiatives development through the nationally recognized Drug Use and Disease State Management Program. The resident is an integral member of multidisciplinary hospital committees, participates in resident journal clubs, and presents seminars. Opportunities to educate students and other healthcare 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. Further DI opportunities and elective rotations include industry, managed care, and a poison center.

Program Director: Colleen Culley, PharmD, BCPS

## **VA Pittsburgh Healthcare System: Pharmacy Practice Residency**

The VA Pittsburgh Healthcare System, in conjunction with the University of Pittsburgh, offers a residency program in pharmacy practice. 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.

The residency provides an integrated experience in acute care, ambulatory care, drug information and practice management, with an emphasis on primary care. The program 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 VA, residents gain invaluable experience in balancing their schedules to provide a “real-life” approach to the residency. 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 of publishable quality and to present two seminars of interview quality to peers, faculty, students, and staff.

Program Director: Lauren Trilli, PharmD, BCPS

**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)

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