Resident Research
2009–10

University of Pittsburgh
School of Pharmacy

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Valuing Our Partners

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

The University of Pittsburgh Medical Center is ranked among the top thirteen of "America's Best Hospitals" according to the 2009 U.S. News and World Report rankings and is one of the leading integrated healthcare delivery systems in western Pennsylvania. UPMC Presbyterian Shadyside, UPMC Mercy and UPMC St. Margaret hospitals participate in our residency programs.

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

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

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

School Mission and Vision

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

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

Message from the Dean

Patricia D. Kroboth, PhD

Dear Members of the Resident Class of 2010,

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 Mercy, UMPC Health Plan, Blackburn's Physicians Pharmacy, 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 Alabama, Wisconsin, Texas, Pennsylvania, West Virginia, Indiana, Minnesota, South Carolina, Illinois, Massachusetts, and Georgia.

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

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

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

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

The success of this program is a result of the efforts of the working group facilitators and other major contributors: Kim Coley, Colleen Culley, Shelby Corman, Amy Donihi, Trish Klatt, Stacy Lavsa, Jan Pringle, Robert Simonelli, Sue Skledar, Pam Smithburger and Melissa Somma McGivney. Amy Seybert, interim chair, and Robert Weber, past chair of the Department of Pharmacy and Therapeutics, must also be recognized for their 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 time and efforts. We would be remiss not to mention the fine administrative support of Kathleen Woodburn. Most importantly, this program is successful because of the commitment of our outstanding residents and faculty mentors.

Evaluation of the Incidence of Hypoglycemia in Critically Ill Patients Receiving Insulin Human Isophane or Insulin Glargine

Agnew AS, Ganchuk SR

PURPOSE

Hyperglycemia in critically ill patients is typically managed with infusions of intravenous regular insulin. However, as patients become more stable, they may be transitioned to subcutaneous insulin regimens that include basal insulin such as insulin human isophane or insulin glargine. The ideal basal insulin regimen for critically ill patients remains unknown. Hypoglycemia is the most common side effect of insulin. This evaluation was conducted to determine if critically ill patients receiving insulin human isophane or insulin glargine for hyperglycemia experience the same incidence of hypoglycemia.

METHODS

A retrospective chart review was completed to determine if there was a difference in the incidence of hypoglycemia in critically ill patients receiving insulin human isophane or insulin glargine. Patients were included in the study if they were admitted to the intensive care unit over a seven-month study period and received insulin glargine or insulin human isophane insulin in conjunction with sliding scale insulin. An electronic chart review was conducted to determine if the hypoglycemia protocol was initiated in these patients.

RESULTS

Incidence of hypoglycemia in patients receiving insulin glargine was 18/72 (25%) and 5/28 (18%) in those receiving insulin human isophane. Of patients who experienced at least one episode of hypoglycemia, 3/5 (60%) receiving insulin human isophane had more than one episode versus 6/18 (33%) receiving insulin glargine. There were two episodes of severe hypoglycemia in each group, 2/5 (40%) with insulin human isophane and 2/18 (11%) with insulin glargine.

CONCLUSIONS

Insulin human isophane was associated with fewer episodes of hypoglycemia than insulin glargine. However, the incidence of severe hypoglycemia and multiple episodes of hypoglycemia was greater with insulin human isophane than insulin glargine.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Amanda Agnew, PharmD

Amanda received her PharmD from the Duquesne University Mylan School of Pharmacy in 2009. She is currently a PGY1 pharmacy practice resident at UPMC Mercy. She plans to complete a PGY2 oncology residency at UPMC Shadyside and then practice as an oncology clinical pharmacist, likely in the outpatient setting.

Faculty Mentor: Steven Ganchuk, PharmD

Improving Adverse Drug Event Detection in Critically Ill Patients Through Screening Intensive Care Unit Transfer Summaries

Anthes AM, Harinstein LM, Seybert AL, Smithburger PL, Kane-Gill SL

PURPOSE

Medication errors and adverse drug events (ADEs) are common in intensive care units (ICUs) where patients often receive many intravenous and "high-alert" medications. Previous studies indicate ICU patients receive twice as many medications compared to non-ICU patients. The prevention of ADEs is especially important in critically ill patients where the risk of ADEs is substantial. Prevention requires a better understanding of the ADEs occurring in this environment so systematic improvements can be made. Institutions typically employ minimally resource intensive detection strategies. The surveillance of hospital discharge summaries for the detection of ADEs is a reasonably easy method; however, the ADEs detected may not accurately represent ADEs occurrring in the ICU. A logical approach would be to evaluate ICU transfer summaries for the detection of ADEs in the critically ill population; however, this method is not currently used. The purpose of this study is to determine if screening ICU transfer summaries is an effective method for the detection of ADEs occurring in critically ill patients by comparing the number and type of ADEs detected in ICU transfer summaries to ADEs detected in hospital discharge summaries.

METHODS

A retrospective medical record review of 400 patients admitted to the medical ICU during January 1, 2009, through October 1, 2009, was completed. Patients were included if they were ≥18 years of age and had a length of stay of ≥48 hours in the medical ICU. The medical record reviews were completed by two trained reviewers. Medical record review of ICU transfer notes and hospital discharge notes included an evaluation of documented ADEs. If an ADE was detected, three separate ADE scales were applied to provide consistent assessment of each event. The ADE assessment scales included the Harvard Medical Practice Scale, the Leonard Evidence Assessment Scale and the World Health Organization toxicity criteria.

RESULTS/CONCLUSIONS

Pending data collection and analysis.

Ananth M. Anthes, PharmD

Ananth received his Pharm.D. from Shenandoah University in 2008 and completed a pharmacy practice residency at St. Joseph Hospital PeaceHealth in the state of Washington in 2009. Upon completion of a PGY2 critical care residency at UPMC Presbyterian, he will join UPMC Presbyterian as a clinical pharmacist in the surgical intensive care unit.

Faculty Mentors: Sandra Kane-Gill, PharmD, MS, FCCM, FCCP, and Amy Seybert, PharmD

Evaluating the Occurrence of QT Prolongation Resulting from Drug-Drug Interactions

Armahizer MJ, Kane-Gill SL, Smithburger PL, Seybert AL

BACKGROUND

More than 50 prescription medications are known to cause QT prolongation, which can deteriorate into torsades de pointes. Little information has been published on the frequency of QT prolongation due to drug-drug interactions in patients admitted to intensive care units (ICUs). This information is of particular interest to clinicians caring for patients in cardiac ICUs, as this population is at heightened risk for adverse outcomes due to QT prolongation.

PURPOSE

In clinical practice, drug-drug interactions occur for two primary reasons: 1) the clinician is unaware of the effects of combining two drugs, and 2) the benefit of therapy outweighs the risk of a potential adverse event due to the drug-drug interaction. The frequency of QT prolongation due to drug-drug interactions (DDIs) in critically ill patients is not well described in the literature, and clinicians may be more likely to underestimate the risk-to-benefit ratio without a reliable quantification of this frequency. The purpose of this study was to identify DDIs resulting in QT prolongation and scrutinize these drug combinations to determine safe and appropriate concomitant use of these medications.

OBJECTIVES

The primary objective was to determine how often QT prolongation occurs as a result of receiving combinations of medications known to prolong the QT interval in patients hospitalized in the Coronary Care Unit (CCU) and/or Cardiothoracic Intensive Care Unit (CTICU).

METHODS

A retrospective evaluation was performed using the institution's electronic data repository. All patients admitted to the cardiac ICUs between August 1, 2008, and July 31, 2009, who experienced QT prolongation (QTc ≥ 500 ms) were included in the study.

RESULTS

Pending completion of data collection.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Michael J. Armahizer, PharmD

Michael graduated from the Duquesne University Mylan School of Pharmacy in 2009 and is currently completing a PGY1 pharmacy practice residency at UPMC Presbyterian. Next year, Michael will complete a PGY2 critical care specialty residency at UPMC Presbyterian and plans to work as a critical care clinician and pharmacy educator in the future.

Faculty Mentors: Sandra Kane-Gill, PharmD, MS, FCCM, FCCP, and Amy Seybert, PharmD

Impact of a Lidoderm® Patch Prior Authorization on Utilization and Cost

Bhavsar R, Hain JL, Corman SL, Daw JR

PURPOSE

Lidoderm® patches are FDA approved for the relief of pain associated with post-herpetic neuralgia (PHN), but they are widely utilized off label for diagnoses such as low back pain, arthritis, and diabetic peripheral neuropathy. Due to the high cost and off label utilization of this medication a prior authorization policy (PA) requiring the diagnosis of PHN was implemented.

METHODS

A retrospective analysis of pharmacy and medical claims nine months before and nine months after the PA implementation was conducted to determine the impact on member utilization and to determine if denial increased narcotic analgesic use or medical costs. The study period for Commercial, Medicare and Special Needs Population was from 4/1/08-9/30/09 and was 5/1/08-10/31/09 for Medicaid. Patients who were continuously enrolled and had at least one paid pharmacy claim for Lidoderm® in the period before PA implementation were included. Other medication utilization before and after the PA implementation was also assessed in this study.

RESULTS

The total number of prescriptions was significantly reduced after the implementation of the PA: 1247 vs. 3868 before the PA (p<0.001). The proportion of members with a PHN diagnosis significantly increased from 6.15% before the PA to 13.15% after the PA; p<0.001. All other medications assessed showed increased utilization. There was a significant decrease in the per member per month (PMPM) total pharmacy costs after the PA, $290.93 vs. $317.13 before (p<0.001). There was also a significant decrease in the PMPM medical costs after the PA, $419.46 vs. $419.32 after (p<0.032).

CONCLUSIONS

The Lidoderm® prior authorization resulted in an increase in the proportion of FDA-approved use from 6.15% to 13.51%. The implementation of the Lidoderm® prior authorization did not result in increased overall medical or pharmacy costs for members previously prescribed Lidoderm®.

Presented at the 22nd Annual Academy of Managed Care Pharmacy for Pharmacists and Pharmacy Residents, San Diego, Calif., 2010, and at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Rameshwari Bhavsar, PharmD

Rameshwari received her PharmD from the Philadelphia College of Pharmacy and completed a managed care pharmacy residency at UPMC Health Plan in 2010. Upon completion of the managed care residency, she plans to practice in a managed care environment.

Faculty Mentor: Shelby Corman, PharmD, BCPS

A Prospective Evaluation of Pharmacist-Run Medication Management Visits with Polypharmacy Patients in a Collaborative Setting

Busby, RM

PURPOSE

Patients taking multiple medications (polypharmacy) are important targets for direct patient care by a pharmacist. The primary objective of this study is to examine the baseline characteristics of and recommendations in polypharmacy patients who are referred in a collaborative care setting to pharmacist-led medication management in family medicine clinics. The secondary objective is to assess the impact of these visits on accuracy of electronic medication lists and patient satisfaction.

METHODS

Polypharmacy patients scheduled for a medication management visit at UPMC St. Margaret Family Health Centers were identified. Patients who agreed to participate had data recorded by a pharmacist after their visit. Participants then received a follow-up telephone call by an investigator every three months from the baseline visit to collect information about their medication list, emergency department visits, hospital visits, and satisfaction with pharmacist integration.

RESULTS

Twenty-eight patients received 103 follow-up telephone calls by investigators. Common co-morbid disease states included hypertension (100%), dyslipidemia (71%), depression/anxiety (54%), gastro esophageal reflux disease (43%), and diabetes (43%). On average, two (0-7) drug-related problems were identified per visit with seven (3-12) interventions per visit. The most frequent interventions included medication education and changes to drug therapy regimens. The mean number of discrepancies with the electronic health record was 4.6 at baseline and 2.6 after one year. Thirty-two percent of participants felt their health care was consistently better throughout the year because a pharmacist works in their doctor's office.

CONCLUSION

Utilizing a physician-pharmacist team approach to medication management may increase medication education, encourage necessary changes to drug therapy regimens, and decrease discrepancies on medication profiles in polypharmacy patients. Some patients consistently feel having a pharmacist at their physician's office improves their health care.

Presented at the 42nd Society of Teachers of Family Medicine Annual Spring Conference, Denver, Colo., 2009.

Presented at the 43rd Society of Teachers in Family Medicine Annual Spring Conference, Vancouver, B.C., 2010.

Rachelle Busby, PharmD

Rachelle received her PharmD from the University of Pittsburgh School of Pharmacy in 2008. After completing a pharmacy practice residency and a family medicine specialty residency at UPMC St. Margaret, she will be providing inpatient and outpatient care as a clinical pharmacist specialist at the University of Chicago Medical Center in Chicago, Ill.

Faculty Mentor: Roberta Farrah, PharmD, BCPS

Evaluation of Venous Thromboembolism Prophylaxis in Post-Orthopedic Procedure Patients

Campbell AR, Wilson GL

PURPOSE

Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are procedures commonly associated with the development of venous thromboembolism (VTE), which has a significant impact on morbidity and mortality in these patient populations. Despite the well-defined need for VTE prophylaxis, the ideal regimen has yet to be described. The primary objective of this study is to evaluate the prophylactic regimens used in orthopedic patients and to assess trends in efficacy and safety associated with each.

METHODS

This was a retrospective chart review of all patients with a diagnosis code equivalent to a total hip or total knee arthroplasty during a three-month period. Information collected included demographic information, procedure performed, risk factors for thromboembolism, type of prophylactic regimen used, duration of prophylaxis, presence of thromboembolic complications at discharge, and evidence of bleeding complications.

RESULTS

A total of 78 patients were reviewed and included in this study. Of these 78 patients, all were found to have been initiated on some form of VTE prophylaxis. Thirty patients were initiated on warfarin alone, forty-two received a low molecular weight heparin (LMWH) alone, five were initiated on a combination of warfarin and a LMWH, and one was started on the combination of warfarin and fondaparinux. Six total adverse events were reported, including three deep vein thromboses, one pulmonary embolism, and two major bleeding events. All of the patients with VTE complications received LMWH alone. Of the two major bleeding events, one was on a combination regimen of warfarin and a LMWH and the other on LMWH alone.

CONCLUSION

It appears orthopedic surgeons are adhering to the guidelines set forth by either the ACCP or AAOS and are adequately utilizing VTE prophylaxis post-operatively.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Allison Campbell, PharmD

Allison received her PharmD from the Duquesne University Mylan School of Pharmacy in 2009. Upon completion of her pharmacy practice residency at UPMC Mercy, she plans to complete a critical care residency at West Virginia University Hospitals.

Faculty Mentor: Gregory Wilson, Jr. PharmD, BCPS

Associations Between Antibiotic Use and *Clostridium Difficile* Infection at UPMC Mercy

Ciamacco CM, Freedy HR

PURPOSE

Hospital-acquired *Clostridium difficile* infection (CDI), which results in increased morbidity and mortality as well as greater healthcare costs, is a growing concern for health care institutions. While reduction of CDI depends in part on proper infection control techniques, overuse of broad spectrum antibiotics is a known risk factor for CDI. This study was conducted to determine which antibiotics are most commonly associated with CDI at UPMC Mercy and to evaluate the appropriateness of antibiotic therapy in patients who develop CDI at our institution.

METHODS

A retrospective chart review was used to collect data on patients who developed CDI from July 2009 through March 2010. Patients were included following a positive *C. difficile* toxin assay within three months of antibiotic exposure at our institution. Information collected included antibiotic regimen, indications for antibiotic use, culture and susceptibility results, days of antibiotic therapy prior to CDI and doses of antibiotics administered reported as defined daily doses (DDD), as well as patient specific data.

RESULTS

Forty-two patients who received a total of 146 courses of antibiotic therapy were included in this study. Ampicillin/sulbactam and piperacillin/tazobactam had the greatest number of DDD prior to the development of CDI at 155 and 123 respectively. Piperacillin/tazobactam additionally had the most days of use prior to CDI (150 days) and was the antibiotic most recent to the positive *C. difficile* toxin assay in the greatest number of patients. Antibiotic use was appropriate in 140 out of 146 cases. Of the six cases of inappropriate antibiotic use, three involved fluoroquinolones while the other three cases involved duplicate antimicrobial coverage.

CONCLUSIONS

Piperacillin/tazobactam was most consistently associated with CDI at our institution based on the total days of use, the number of defined daily doses, second only to that of ampicillin/sulbactam, and the proximity of piperacillin/tazobactam usage to the positive *C. difficile* toxin assay in the greatest number of patients. None of the cases of ampicillin/sulbactam or piperacillin/tazobactam use were judged to be inappropriate; however, further assessment of the use of beta-lactam/beta-lactamase inhibitor agents at our institution is warranted.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Cara Ciamacco, PharmD

Cara received her PharmD from the Duquesne University Mylan School of Pharmacy in 2009. Following completion of a pharmacy practice residency at UPMC Mercy, she will further her training through an infectious diseases pharmacy residency at Barnes-Jewish Hospital in St. Louis, Mo. Cara plans to become an infectious diseases pharmacy specialist at an academic medical center and clinical faculty at a school of pharmacy.

Faculty Mentor: Henry Freedy, PharmD

An Analysis of Antihypertensive Medication Adherence Among Patients Receiving Prescriptions Through a 90-Day Maintenance Program at Retail Compared with Mail Order

Conforti B, Hutchins D

PURPOSE

The purpose of this study is to evaluate antihypertensive medication adherence of patients enrolled in a new pharmacy benefit, CVS Caremark's Maintenance Choice™ plan (MChoice), and compare adherence rates based on medication acquisition method through retail and mail order channels.

HYPOTHESIS

With cost being constant, CVS Caremark's MChoice patients opting for the retail service will have improved adherence to prescriptions for antihypertensive medications when compared to mail order due to increased medication access in the retail setting as well as higher quality patient care provided through personal interactions with the retail pharmacist.

METHODS

This is a retrospective database analysis of prescription claims for MChoice patients receiving key antihypertensives to compare medication adherence among patients selecting different distribution channels (i.e., retail versus mail order). Key antihypertensives (hydrochlorothiazide (HCTZ), amlodipine, Angiotensin Converting Enzyme Inhibitors (ACE-Is), Angiotensin Receptor Blockers (ARBs) and their HCTZ combinations) reflect medications determined to be the most commonly prescribed agents for the treatment of hypertension by combining information from JNC-7 and the PBM preferred drug list with the researcher's clinical judgment. The timeline for the study is as followed: 6 month pre-period (07/01/2008 – 12/31/2008), 3 month index window (01/01/2009 – 03/31/2009) and a 9 – 12 month evaluation period (04/01/2009 – 12/31/2009). The primary outcome metric for this analysis is the medication possession ratio (MPR) with a MPR ≥ 80% identifying adherence. A secondary MPR calculation will be performed on patients identified as non-adherent (MPR < 80%) if the patient received an alternative agent to treat hypertension, identified by any agent listed by JNC-7, to determine whether medication switching is a possible reason for non-adherence. Therefore, an important inclusion/exclusion criterion is that patients must index on only key antihypertensives in regard to hypertension therapy.

RESULTS

The MPR results for patients indexed on key antihypertensives and for suspected switch therapy, in the non-adherent population, will be recorded and compared based on channel as well as patient age, sex, geographic region, and automatic refill status.

Brandon C. Conforti, PharmD

Brandon stayed close to home while earning his PharmD from Wilkes University in 2009. He decided to pursue a residency in pharmacy management when the University of Pittsburgh developed a community-based program associated with CVS Caremark, a company he has been working with for nearly 10 years. He will complete an MS in pharmacy administration in the second year of the residency.

Faculty Mentors: Colleen Culley, PharmD, BCPS, and Scott Mark, PharmD, MS, MEd, FASHP

Evaluating the Impact of a Health System Pharmacy Dashboard across a Multi-hospital System

Davis SJ, Weber RJ, Skledar SJ, Potoski BA, Mark SM

PURPOSE

Dashboards are an effective means of providing timely information. Hospitals and health care organizations depend on data for daily management as well as strategic planning of patient-centered services. Medication turn-around-time (TAT) is a significant pharmacy operational concern of physicians and nurses. The pharmacy department must systematically monitor TAT and develop agreed-upon standards for acceptable times.

METHODS

We compared Key Performance Indicator (KPI) metrics from fiscal year 2009 as well as a prospective review of KPI metrics targets (*pharmacy administered immunizations; AcuDose-RX® restock errors/1000 restocks < 0.50%; medication order processing < 85 minutes; < 150 Defined Daily Doses (DDD)/1,000 patient days; and Implementation of McKesson Automation Decision Support (ADS), etc.*) post-implementation of a system wide dashboard from July 2009 through March 2010. We surveyed pharmacy directors to assess their perceptions on the effectiveness of the dashboard.

RESULTS

Medication TAT improved after the implementation of the health system pharmacy dashboard with 70% of hospitals meeting their KPI target vs 30% pre-dashboard. Fluoroquinolone DDD, AcuDose restock error rates, pharmacists administered immunizations, and ADS also improved post-implementation of the health system pharmacy dashboard.

CONCLUSION

The health system pharmacy dashboard helped a majority of hospitals to reach their KPI targets. It served as an effective visual aid and a measuring tool for improving performance. It was also effective in providing pertinent information within the pharmacy department and served as a valid communication tool outside the pharmacy department.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Stephen J. Davis, PharmD, MS

Stephen received his PharmD from Auburn University Harrison School of Pharmacy in 2008 and a MS in pharmacy administration at the University of Pittsburgh School of Pharmacy in 2010. Upon completion of the health-system pharmacy administration residency at UPMC Presbyterian, he will join Texas Children's Hospital Main Campus in Houston, Texas, as a pharmacy manager.

Faculty Mentors: Susan Skledar, RPh, MPH, FASHP, and Scott Mark, PharmD, MS, MEd, FASHP

Combination Therapy Options for Extreme Drug Resistant *Acinetobacter* (XDR-AB) Not Susceptible to Colistin and Tigecycline

Dorobisz MJ, Shields RK, Nguyen MH, Doi Y, Clancy CJ, Potoski BA

PURPOSE

We recently demonstrated *in vitro* synergy and favorable clinical outcomes for the combination of doripenem (DOR) and colistin (COL) against pan-resistant *Acinetobacter* (susceptible only to COL). XDR-AB (resistant to all agents including COL) is increasingly isolated from patients at our center. In order to identify useful treatment combinations, we evaluated susceptibility of XDR-AB isolates to three agents (DOR, COL and ampicillin/sulbactam (A/S)) alone and in combination.

METHODS

Six XDR-AB isolates were typed by PFGE and screened for synergy using E-test. E-test results were confirmed by: a) checkerboard microdilution (CM) testing (DOR, COL, and A/S concentrations: 0.125-128, 0.5-512 and 0.5-512 µg/mL, respectively); and b) time-kill assays (TKA) using clinically achievable DOR, COL and A/S serum concentrations (8, 1, and 16 µg/mL, respectively) alone and in combination.

RESULTS

Isolates were genetically diverse by PFGE and non-susceptible to COL, DOR, and A/S (MIC range: 8->512, 8-32, 32-64 µg/mL, respectively). Synergy or additivism was demonstrated by E-test and CM method with DOR + COL against 67% and 100%, respectively, A/S + COL against 100% by both methods, and A/S + DOR against 67% and 100%, respectively. A/S + DOR and DOR + COL lowered the MIC of each drug to achievable serum levels in all isolates by CM testing. A/S + COL exhibited similar results in 67% of isolates. By TKA, all DOR + COL and A/S + COL were cidal (≥ 3 $\log_{10}$ decrease in CFU/mL) by 8 hours. DOR + COL and A/S + COL resulted in complete eradication with no regrowth after 12 and 24 hours, respectively. DOR + COL exerted more rapid cidal action than A/S + COL. A/S + DOR, however, exhibited rapid regrowth between 8 and 24 hours.

CONCLUSIONS

The combinations of DOR + COL and A/S + COL may be valuable options for patients infected with XDR-AB. Clinical studies are needed to explore the value of these potential therapies. The regrowth seen with A/S + DOR suggests caution in using these agents simultaneously.

Abstract submitted to the 50th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

Monica Dorobisz, PharmD

Monica received her PharmD from Northeastern University in Boston, Mass., in 2008 and completed a PGY1 pharmacy practice residency at Seton Family of Hospitals in Austin, Texas. Upon completion of an infectious diseases residency at UPMC Presbyterian, she will be joining Kent Hospital in Warwick, R.I., as an infectious diseases pharmacy specialist.

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

The Effect of Transitioning from Charge on Dispense to Charge on Administration on Charge Capture Rate

Eggers GG, Oriolo V, Lacava A, Skledar S, Culley C, Saenz R, Mark SM

BACKGROUND

In order to ensure more accurate patient billing for medications administered to inpatients, many hospitals have transitioned from a traditional charge on dispense (COD) patient billing system to a charge on administration (COA) system. A COD billing system can result in inappropriate billing of patients due to medications being dispensed, charged to the patient, and never administered to the patient. Accurate medication billing is important to hospitals because insurance audits revealing patient overcharging can result in charges of fraud, fines, and decreased reimbursement from third-party payers. The process of COA requires accurate and consistent charting of administered medications in order for the hospital to capture all billable charges. As a result of the transition from COD to COA, charge capture rate can be significantly reduced.

METHODS

We performed a retrospective review of medication purchase, dispense and charge data from 3/1/08 to 8/31/08 (COD) and from 3/1/09 to 8/31/09 (COA) to calculate charge capture rate for five high-cost per dose continuous infusions (milrinone, argatroban, lepirudin, bivalirudin, and nicardipine) and five low-cost per dose continuous infusions (dopamine, heparin, propofol, dobutamine, and PrismaSate®). A Chi-squared test was performed to determine the statistical significance of change in charge capture rate for each individual drug.

RESULTS

Transitioning from charge on dispense to charge on administration resulted in a statistically significant ($p<0.05$) decrease in charge capture rate for seven of the study medications (milrinone, lepirudin, bivalirudin, nicardipine, heparin, propofol, and PrismaSate®) and a statistically insignificant decrease in charge capture rate for argatroban and dopamine. Dobutamine showed a statistically significant increase in charge capture rate after changing from charge on dispense to charge on administration.

DISCUSSION

Changing from charge on dispense to charge on administration can significantly decrease charge capture rate for several continuous infusion medications. Further research is needed to determine the sources of these lost charges.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Garrett Eggers, PharmD

Garrett received his PharmD from the University of Wisconsin School of Pharmacy in 2008 and is currently a pharmacy practice management resident at UPMC Presbyterian and is a graduate student at the University of Pittsburgh. Upon completion of his residency, he plans to pursue a position in inpatient pharmacy management.

Faculty Mentors: Susan Skledar, RPh, MPH, FASHP, and Scott Mark, PharmD, MS, MEd, FASHP

Medication Reconciliation in Large Primary Care Clinic Patients Recently Discharged from the Hospital

Elrod SE, Donehoo J, Wishwa K, Fischer G, Hall DG

PURPOSE

The purpose is to assess the number of medication discrepancies in University of Pittsburgh Physicians General Internal Medicine – Oakland (GIMO) patients who have been recently discharged from the hospital by comparing outpatient medication lists with the inpatient discharge summary. In addition, this project aims to identify risk factors which may increase the potential for medication discrepancies between inpatient and outpatient medication lists of GIMO patients recently discharged from the hospital.

METHODS

A retrospective, cohort study will be used to compare medication lists from inpatient discharge summaries with outpatient electronic medical records in patients who have been recently discharged from a University of Pittsburgh Medical Center (UPMC) inpatient facility. Existing GIMO patients at least 18 years of age who have been discharged to home from a UPMC inpatient facility will be eligible for this study. Currently, as a part of usual care, a GIMO clinical pharmacist receives a list of patients who have been discharged from a UPMC inpatient facility and calls all clinic patients who have been discharged to home within 48 hours of discharge. A panel of three pharmacists will review potential medication discrepancies to ensure confirmation of an actual medication discrepancy. Only GIMO PCP medication lists contained in the outpatient electronic medical record occurring within 14 days of the index admission discharge date will be assessed for discrepancies. Medication discrepancy will be defined for the purpose of the study as any inconsistency between the name, frequency, and route of administration between the two medication lists.

RESULTS

Results will be available in June 2010.

Shara Summers Elrod, PharmD

Shara graduated from the University of Texas at Austin College of Pharmacy in 2008, and completed a PGY1 community pharmacy residency at the University of Pittsburgh in 2009. After completing an ambulatory specialty residency Shara will join Nova Southeastern University as an Assistant Professor of Pharmacy Practice helping to manage comorbidities in an HIV/AIDS clinic in Fort Lauderdale, Fla.

Faculty Mentor: Deanne Hall, PharmD, CDE

Impact of Clinical Decision Support Alerts on Incidence, Type and Severity of Opioid-related Adverse Drug Events in Elderly Inpatients

Foley JJ, Kane-Gill SL, Smithburger PL

PURPOSE

Opioid analgesics are the most common therapeutic class implicated in adverse drug events (ADEs) among hospitalized adults. Elderly patients are at increased risk of harm from ADEs due to declining hepatic and renal function, multiple comorbidities and complex drug therapy. Clinical decision support (CDS) is a broad category of automated tools intended to enhance the accuracy of the medication ordering process, and includes dose-range checking, allergy and renal function alerts. Combining CDS with computerized physician order entry (CPOE) has been offered as a strategy to prevent medication errors occurring at the point of prescribing, but few studies have examined the effectiveness of CDS for prevention of ADEs. The purpose of this investigation was to evaluate the impact of dose-range checking (DRC) alerts on the incidence, type and severity of opioid-related ADEs in elderly inpatients.

METHODS

Inpatients on one of nine study units between January 2009 and October 2009 were included if age ≥ 70 years and were administered intravenous fentanyl, remifentanyl, hydromorphone, morphine and/or meperidine. Medical records were retrieved by an electronic search of the University of Pittsburgh Medical Center (UPMC) Medical Archival Repository System (MARS) database and reviewed independently for the occurrence of an ADE by two clinical pharmacists. A training protocol was developed to enhance the validity and reliability of the judgments of the individual reviewers. If an ADE was suspected during chart review, assessments of causality and severity were performed using two validated assessment tools. Any disagreement between reviewers on causality or severity was discussed until consensus was reached. Statistical analyses of these results will be conducted using descriptive statistics: Chi-square and student t-tests, when appropriate. All patient-specific data were produced by a third party and de-identified before delivery to the investigators for this study.

RESULTS

The incidence, type and severity of opioid-related ADEs in our study population will be recorded and results will be presented.

CONCLUSIONS

We anticipate this study will show that these alerts, activated at the point of prescribing, will reduce dosing errors by physicians and lead to a reduction in the incidence and severity of opioid-related ADEs.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

John J. Foley, PharmD

John received his PharmD from the Temple University School of Pharmacy in 2009 and completed a pharmacy practice residency at UPMC Presbyterian in 2010. John will return to Philadelphia as a clinical specialist with the Hospital of the University of Pennsylvania in their outpatient Anticoagulation Clinic.

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

An Innovative Technique to Reduce Pharmacy Dispensing Errors

Forsberg EA, Campbell RJ

PURPOSE

Despite the implementation of high-cost, technologically-advanced dispensing systems, pharmacy dispensing errors persist in U.S. hospitals and represent a deficiency in the delivery of safe, efficient, high-quality pharmacy services. Rates of pharmacy dispensing errors have been associated with noise, prescription workload, lighting levels, and interruptions. A survey of pharmacy technician staff at UPMC St. Margaret revealed that telephone calls were rated as the top distraction encountered while filling prescription orders. The purpose of this study was to determine whether the implementation of unit-based pharmacy technicians with portable telephones will reduce both pharmacy filling error rates and numbers of telephone calls to the central filling area.

METHODS

A pre-intervention baseline rate of filling errors and telephone calls was obtained during daily one-hour intervals over a 10-day period. Following the implementation of unit-based pharmacy technicians, rates of filling errors and number of telephone calls were then collected in the same manner over the next 10 days. Doses were included if they were obtained from the pharmacy shelving area or the automated medication carousel. Extemporaneously compounded IV doses were excluded. The primary outcome is rate of filling errors. The secondary outcome is number of phone calls. Distractions measured included the number of phone calls to the technician filling area and number of doorbell rings. Additionally, pharmacy and nursing staff were surveyed to assess acceptability of the intervention.

RESULTS

A total of 940 doses were evaluated in the pre- and post-intervention phases. There was a reduction in the number of filling errors, from 10 to 6 errors, but this difference was not noted to be statistically significant. Additionally, there was a non-significant reduction in the number of phone calls from 164 to 113. However, pharmacy and nursing surveys showed positive response to the new workflow.

CONCLUSIONS

The implementation of unit-based pharmacy technicians with portable phones did not result in a statistically significant decrease in the rate of filling errors, but was a well-accepted workflow change. Further studies with a larger number of doses are necessary to determine statistical significance.

Presented at the 43rd Annual Society of Teachers of Family Medicine Spring Conference, Vancouver, B.C., 2010.

Elizabeth Forsberg, PharmD

Liz earned her PharmD from the University of Pittsburgh School of Pharmacy in 2009. Liz is completing a PGY1 pharmacy residency at UPMC St. Margaret, where she will remain as a clinical pharmacist.

Faculty Mentor: Ronald Campbell, PharmD, BCPS

Use of an Abnormal Laboratory Value-Drug Combination Alert to Detect Drug-Induced Thrombocytopenia in Critically Ill Patients

Harinstein LM, Kane-Gill SL, Smithburger PL, Seybert AL

PURPOSE

Thrombocytopenia commonly occurs in intensive care unit (ICU) patients. The occurrence of thrombocytopenia in critically ill patients has a significant negative impact on mortality, duration of mechanical ventilation, and risk of bleeding. Adverse drug reactions (ADRs) comprise one of many possible causes of thrombocytopenia in the ICU, but remain difficult to accurately elucidate. Implementation of strategies, such as computerized clinical event monitors (CEM) that generate alerts for potential ADEs, are needed to aid in the identification of drug-induced thrombocytopenia. The primary purpose of this study was to determine the performance of an alerting system for drug-induced thrombocytopenia in the medical and cardiac ICUs by calculating the positive predictive value (PPV) for the alert.

METHODS

Quality Improvement Committee approval was obtained prior to commencement. Subjects included all adults admitted to the medical ICU (MICU) and cardiac ICU (CICU) at UPMC Presbyterian during an eight-week period from January 25, 2010, through March 21, 2010, who were identified by the ADE:Drug-induced thrombocytopenia alert contained in the CEM, TheraDoc®. The alert is generated after a patient meets the criteria for a low platelet count and is receiving a potentially causal medication. Demographic information and data necessary to calculate severity of illness scores were obtained through the electronic medical record. A pharmacist was responsible for evaluating the alert for the presence of an ADR using three different published causality instruments. A 2-out-of-3 agreement of possible or greater between instruments indicated the presence of an ADR. The PPV for the alert was calculated as the number of times the alert detected an ADR divided by the total number of alerts fired.

RESULTS

At four weeks, 34 patients met inclusion criteria with 27 in the MICU and seven in the CICU.
A total of 238 alerts fired with beta-lactam antibiotics, vancomycin and acetaminophen as the three most common potential drug causes. The PPV of the thrombocytopenia alert was 0.42 resulting in a number needed to alert of 2.38 to detect one potential ADE.

CONCLUSIONS

Pending data collection and analysis.

Presented as a poster presentation at the American Society of Health-System Pharmacists Midyear Clinical Meeting, Las Vegas, Nev., 2009.

Lisa M. Harinstein, PharmD

Lisa received her PharmD from the University of Michigan College of Pharmacy in 2008 and completed a pharmacy practice residency at UPMC St. Margaret in 2009. Upon completion of a PGY2 critical care residency at UPMC Presbyterian, she will be working as a surgical ICU clinical specialist at Cleveland Clinic.

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

Risk of Hypoglycemia in Hospitalized Patients Prescribed a Sulfonylurea

Hedrick CM, Coley KC, Donihi AC

PURPOSE

To identify the incidence of and risk factors associated with hypoglycemia in patients taking sulfonylureas in a tertiary care hospital.

METHODS

A nested case-control study of adult patients who received a sulfonylurea while an inpatient at UPMC Presbyterian between November 1, 2008, and October 31, 2009, was performed. Case patients included those who experienced hypoglycemia (BG <70 mg/dL) during sulfonylurea treatment. Control patients included those who never experienced hypoglycemia. Controls were matched one-to-one with cases based on gender and number of days treated with a sulfonylurea. Potential risk factors for the development of hypoglycemia including patient age, incidence of renal insufficiency (defined as GFR $\leq$30 ml/min/1.73m^2), NPO status, concomitant use of insulin and beta blockers, and nursing unit location (ICU vs. non-ICU) were compared between cases and controls using Mann Whitney U tests or Chi-square tests as appropriate. Covariates with p values $\leq$ 0.1 were included in a multivariate logistic regression model.

RESULTS

Overall 16% of patients who received a sulfonylurea experienced at least one episode of hypoglycemia. A total of 117 case patients were matched to 117 control patients. The median number of days, that patients were charged for a sulfonylurea was 4 (range 1-13) days and 56% of patients were female. Cases were more likely to be $\geq$65 (73.5% vs. 53%, p<0.001), have renal insufficiency (18% vs. 7%, p=0.013), receive long-acting insulin (28% vs. 14.5%, p=0.012) and be prescribed glyburide (39% vs. 29%, p=0.99). Cases were less likely to receive glipizide (44% vs. 57%, p=0.05). There were no differences in NPO status (17% vs. 14%), treatment with beta blockers (62% vs. 53%), and ICU location (3% vs. 2%). Age $\geq$65 (odds ratio [OR] = 3.07, p<0.001), long-acting insulin (OR = 3.01, p=0.002), and renal insufficiency (OR = 3.64, p<0.006) were identified as predictors of hypoglycemia and use of glipizide (OR = 0.44, p<0.005) was found to be protective in the multivariate logistic regression model.

CONCLUSIONS

These results can be used to identify hospitalized patients for whom sulfonylurea agents should be avoided due to their high risk for sulfonylurea-related hypoglycemia.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Christina Hedrick, PharmD

Christina received her PharmD from West Virginia University School of Pharmacy in 2009. Upon completion of a pharmacy practice residency at UPMC Presbyterian, she plans to practice in a hospital setting, continue to develop her clinical skills, and precept students.

Faculty Mentor: Amy Donihi, PharmD, BCPS

COPD and Dosing of Systemic Corticosteroids According to the GOLD/ATS Guidelines

Henry JM, Gingo LL

PURPOSE

The objective of this study is to assess the appropriateness of systemic corticosteroid prescribing in the management of COPD exacerbation in hospitalized patients with respect to dosage, frequency, and duration of therapy recommended by the GOLD/ATS Guidelines. The primary outcome was compliance with guideline recommendations. The secondary outcome was the incidence of hyperglycemia in low-moderate-and high-dose steroid groups.

METHODS

The use of systemic corticosteroids for COPD exacerbation at UPMC St. Margaret was reviewed retrospectively to assess appropriateness of prescribing according to the GOLD/ATS Guidelines. Medical charts of patients admitted from May 2009 to October 2009 with the primary diagnosis of COPD exacerbation were examined. Data that was collected that included direct versus emergency department admission, past medical history, medication use during admission, ordered diet, length of stay, smoking history, and demographic data. Information pertaining to corticosteroid use was collected that included the dose, route, and frequency. Order set utilization was also examined along with in-house versus discharge taper of the steroid. Patients were also assessed for relapse of COPD, by examining the rates of 30-day readmission post discharge for exacerbation.

RESULTS

Two hundred and fifty-nine admissions for exacerbation of COPD (218 patients) were identified during the study period. High dose steroid (>200 mg of prednisone equivalent) was prescribed for 72% of the study population. A moderate dose (100-200 mg of prednisone equivalent) was prescribed for 20% of the study population, and finally a low dose (<100 mg prednisone equivalent) was prescribed for 8% of the patients. The number of blood glucose values >200 mg/dl (average per patient) was 14.84 for the low-dose group, 13.58 for the moderate-dose group, and 15.85 for the high-dose group.

CONCLUSION

This retrospective study demonstrated that currently most patients admitted for COPD exacerbation are not dosed according to guideline recommendations and that high-dose regimens resulted in a higher incidence of hyperglycemia.

Presented at the Society of Teachers in Family Medicine Conference, Vancouver, B.C., 2010.

Jessica Henry, PharmD

Jessica is originally from Mechanicsburg, Pa. She earned B.S. degrees in both biology and psychology from Penn State before earning her PharmD from the LECOM Shool of Pharmacy. Upon completion of her PGY1 pharmacy practice residency at UPMC St. Margaret, she plans to complete a PGY2 psychiatry and neurology specialty residency at the Cleveland VA.

Faculty Mentor: Leslie Gingo, PharmD, BCPS

Impact of an OxyContin® Formulary Change on Member Opioid Utilization and Prescriber Practice

Holzworth A, Hain J, Corman S, Daw J

PURPOSE

FDA and Centers for Medicaid and Medicare Services (CMS) have recognized OxyContin® for its high abuse, misuse, and diversion potential. UPMC Health Plan placed a prior authorization on OxyContin® for Commercial members and removed it from formulary for Medicaid and Medicare members. This study was conducted to determine the impact of the formulary management techniques for OxyContin® on prescription utilization and both pharmacy and medical costs.

METHODS

A retrospective claims analysis was conducted using de-identified pharmacy and medical claims. The study evaluated the utilization of OxyContin® 9 months pre-and post-formulary change implementation in each line of business. The study analyzed the cost and utilization of narcotic analgesics and overall medical expenses for members with a paid claim for OxyContin® before the formulary change who were denied access to OxyContin® as a result of the change. The study analyzed the change in prescribing patterns of the top 20 OxyContin® prescribers nine months pre- and post-formulary change.

RESULTS

Overall OxyContin® utilization changed from 11,475 total prescriptions pre-formulary change to 3,556 total prescriptions post-formulary change ($p<0.001$). A total of 1639 members had a paid claim for OxyContin® pre-formulary change; 329 (20.1%) remained on OxyContin® post-formulary change. Of the 1301 (79.9%) members who did not receive OxyContin® post-formulary change, 1142 (87.2%) switched to an opioid alternative and 168 (12.8%) did not switch to any other opioid alternative. Change in opioid prescription costs and medical costs (per member per month) pre- to post-formulary change was $153.85 to $62.58 ($p<0.001$) and $486.52 to $314.58 ($p<0.001$), respectively. Prescribing patterns changed post-formulary change with the number of OxyContin® prescriptions decreasing, while the number of Opana ER®, morphine sulfate ER, and fentanyl patch prescriptions increased.

CONCLUSIONS

The OxyContin® formulary change did not result in an adverse cost increase while helping to shape prescribing and utilization of opioids to preferred formulary alternatives. Of the patients not receiving OxyContin® as a result of the formulary change, 12.8% did not receive any opioid alternative to OxyContin®.

Presented at the 22nd Annual Academy of Managed Care Pharmacy for Pharmacists and Pharmacy Residents, San Diego, Calif., 2010, and at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Ashley Holzworth, PharmD

Ashley received her PharmD from the University of Pittsburgh School of Pharmacy in 2009. Upon completion of the pharmacy managed care residency at the UPMC Heath Plan, Ashley will join Blue Cross Blue Shield of Western New York in Buffalo, NY as a clinical pharmacy specialist.

Faculty Mentor: Jocelyn Hain, PharmD

Assessment of the Impact of Dashboards and Scorecards on Pharmacist Activities

Jenkins MT, Saenz R, Culley CM, Skledar SJ, Schilling DE, Mark SM

PURPOSE

Health systems use data analysis across all areas of the pharmacy department from operations to clinical services. Benchmarking aids an organization in identification of areas of excellence in performance, areas for improvement, and potential areas of new services—in this case clinical pharmacy services. One challenge facing directors of pharmacy is how to encourage pharmacists to voluntarily report their clinical interventions.

Dashboards are visual performance representations which may be used by health-system pharmacy administrators to track and display operations indicators other than financial indicators. This study looks to assess the utility of using both a dashboard and scorecard system as a visual feedback mechanism to influence pharmacist behavior in regard to intervention documentation.

METHODS

A retrospective review of documented clinical interventions using Theradoc® databases was performed examining the timeframe from January 1, 2009, to December 31, 2009. Pre-implementation data defined in 2009 was compared to data from February 1, 2010, through April 30, 2010. Metrics for assessment were chosen based on pharmacist activities plus national patient safety goals and national core quality measures.

RESULTS

Total interventions per month rose in February to 2933 compared to an average of 740 in 2009. Across the three pharmacy service lines, the greatest changes observed as an average per pharmacist were as follows: Critical Care Medicine: IV to PO conversion (60 v. 14.40), antibiotic duration of therapy (53 v. 28.5); Medicine: Pharmacist review of anticoagulation regimens (205 v. 60), avoidance of inappropriate therapy (99 v. 24.25), pharmacist dosing of warfarin (57 v.13.6); Transplant: IV to PO conversion (17 v. 0) and avoidance of inappropriate therapy (3 v. 0.25).

CONCLUSION(S)

Providing pharmacists with a feedback mechanism on their performance can improve documentation of performed interventions.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Matthew T. Jenkins, PharmD

Matt received his PharmD from the Auburn University in 2009 and is completing the first of two years in a pharmacy practice management residency at UPMC Presbyterian. Upon completion of his residency, he plans to practice in a hospital setting and has a strong interest in pharmacy practice model change.

Faculty Mentors: Rafael Saenz, PharmD, MS; Susan Skledar, RPh, MPH, FASHP; and Scott Mark, PharmD, MS, MEd, FASHP

The Impact of Tacrolimus Monotherapy on the Development of Hyperlipidemia After Liver Transplantation

Johnson D, Johnson HJ, Schonder KS

PURPOSE

Cardiovascular disease is a leading cause of mortality in liver transplant patients, accounting for nearly 20% of non-immune related death after liver transplantation. Hyperlipidemia, a risk factor for the development of cardiovascular death and disease, occurs in 16-58% of liver transplant patients. Immunosuppressive therapy contributes to hyperlipidemia, where the degree of hyperlipidemia is dependent on the immunosuppressive regimen used after transplantation. This study is the first to test the whether liver transplant patients treated with complete tacrolimus monotherapy have lower rates of hypercholesterolemia within the first year of transplantation compared to those treated with both tacrolimus and steroids.

METHODS

Patients who received a liver transplantation between 1994 and 2008 and were 18 years or older at the time were stratified on the basis of steroid use at discharge. Hyperlipidemia was assessed at 1, 3, 6, and 12-months after transplantation. Hyperlipidemia was defined as any of the following: (1) total cholesterol ≥ 200 mg/dL, (2) LDL ≥ 130 mg/dL or LDL ≥ 100 mg/dL in patients with diabetes mellitus, (3) triglycerides ≥ 150 mg/dL, or (4) initiation of cholesterol-lowering medications.

RESULTS

Baseline characteristics were similar between groups. Patients were predominately white and male. As expected the primary reason for liver transplantation was alcoholic cirrhosis and hepatitis C infection, Non-alcoholic Steatohepatitis (NASH), Post-Necrotic Cirrhosis, and Primary Sclerosing Cholangitis. Total cholesterol was significantly higher in the dual therapy group vs. mono therapy, 6 months after transplantation 175.5 mg/dL, 154.7 mg/dL, p= 0.021. Additionally patients treated with both tacrolimus and steroid were more likely to have total cholesterol ≥ 200 mg/dL, p= 0.011 and triglycerides ≥ 150 mg/dL, p=0.002, 3 months after transplantation than patients treated with monotherapy.

CONCLUSION

Dual therapy immunosuppression with tacrolimus and steroid after liver transplantation significantly increases the risk for hyperlipidemia compared to immunosuppression with tacrolimus monotherapy. Future studies should investigate the impact of tacrolimus monotherapy on cardiovascular events.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

David Johnson, PharmD

Originally from Sumter, SC, David graduated from the University of Pennsylvania in 2005 where he earned a BA degree in neuroscience and earned his PharmD from the University of Michigan in 2009. After completing the PGY1 pharmacy residency at UPMC Presbyterian, David will pursue his interests in the area of solid organ transplantation in PGY2 Transplant Pharmacy Residency at UPMC Presbyterian.

Faculty Mentor: Heather Johnson, PharmD, BCPS, and Kristine Schonder, PharmD

Pharmacist Integration into the Medical Home: A Qualitative Analysis

Kozminski ME, Busby RM, McGivney MS, Klatt PM, Merenstein JH

PURPOSE

The medical home is a means to improve primary care in the United States through improved coordination and management of a patient's care. Given the growing complexity of medication regimens and increasing medication-related problems, pharmacists' incorporation into the medical home may significantly improve patient care. The purpose of this qualitative study was to assess the thoughts and feelings of members of an interdisciplinary team regarding their experience during pharmacists' integration into the medical home.

METHODS

Family medicine physicians, staff, pharmacists, and patients were interviewed to determine their early perceptions during pharmacists' integration into the medical home. Patients were surveyed or interviewed after a pharmacist's evaluation. Monthly interviews were conducted with pharmacists. All interviews were performed over a three-month period. Interview questions included standardized trigger questions focused on how the pharmacists' integration affected the practice with probing questions designed to more fully capture thoughts and feelings. All interviews were conducted by study investigators and continued until model saturation occurred.

RESULTS

Eighty-four interviews were conducted: 21 with family medicine practitioners, 26 with clinical staff, 9 with non-clinical staff, 13 with patients, 6 with pharmacists, 8 with the office managers, and 1 with the study coordinator. Themes were identified using the principles of Grounded Theory. Practitioners thought having a pharmacist in the office increased the quality of care due to the increased time the pharmacist had to spend with patients. Staff utilized pharmacists to answer patient questions. Patients liked the convenience of having the pharmacist in their doctor's office and did seem to value the service, but did not always understand the pharmacist's role. Pharmacists felt like part of the team within a couple months, but time management continued to be a challenge.

CONCLUSION

All interviewees expressed a positive experience with the inclusion of pharmacists in the medical home. Including a pharmacist in the medical home improves the quality of patient care and provides a valuable resource for all providers, staff, and patients.

Presented at the 2010 American Pharmacists Association Annual Meeting and Exposition in Washington D.C.

Melinda M. Kozminski, PharmD

Mindy received her PharmD from the University of Pittsburgh in April 2009. After completing a community pharmacy practice residency at the University of Pittsburgh and Rite Aid, she will be working for Gateway Health Plan as a clinical pharmacist.

Faculty Mentor: Melissa McGivney, PharmD, FCCP

Assessing the Impact on Patient Safety of Barcode Verification and an Electronic Drug Dosing Library for Patient-Controlled Analgesia

Little JD, Skledar SJ, Niccolai CS, Mark SM, Simmons RL

BACKGROUND

Opioids are among medication classes with the highest risk of causing adverse drug reactions. When used for patient-controlled analgesia (PCA), opioids are particularly dangerous due name confusion, potency differences, complex dosing regimens, and in some cases the lack of a commercially available premixed PCA product. Errors with opioids can occur at any step of the medication use process, including prescribing, dispensing, and administration. The last critical step in PCA administration is manual programming of the infusion pump to deliver the medication to the patient. Programming errors are particularly dangerous and difficult to detect. These reasons led the University of Pittsburgh Medical Center (UPMC) to purchase software to enhance the existing PCA pumps allowing for barcode medication recognition of the PCA product and concentration. This software which also required the creation of a PCA drug library which includes soft and hard limits for dosing within specialty care area profiles was implemented on July 6, 2009.

METHODS

A retrospective review of naloxone administration for opioid reversal and reported medication errors and adverse drug events related to PCA use in hospitalized inpatients was performed at UPMC Presbyterian. Pre-implementation data from 1/1/09 through 6/30/09 were compared to post-implementation data from 8/1/09 through 1/31/10.

RESULTS

There were 3,468 patients in the pre-implementation group and 3,310 patients in the post-implementation group. Preliminary analysis indicates that the rate of naloxone use did not change after implementation of the software. The number of reported potentially serious errors due to PCA pump programming decreased from six in the pre-implementation period to zero in the post-implementation period.

CONCLUSION

It is anticipated that the upgrade to PCA barcode recognition software and development of a drug dosing library will demonstrate a decrease in potentially serious medication errors and adverse drug events associated with PCA use.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Jeffrey D. Little, PharmD, MPH

Jeff received his PharmD from the University of Kansas in 2008 and his Master's in public health from the University of Pittsburgh School of Public Health in 2009. Jeff is completing the second of two years in a health-system pharmacy administration residency at UPMC Presbyterian. Upon completion of the residency in June 2010, Jeff will begin a position as manager of Central Pharmacy at Children's Mercy Hospital in Kansas City, Mo.

Faculty Mentors: Susan Skledar, RPh, MPH, FASHP, and Scott Mark, PharmD, MS, MEd, FASHP

Differences in Dietary Supplement Use Between College Student Athletes and the General Student Body

Lowry BE, Coley KC, McGivney MS, Swanson DP

PURPOSE

While NCAA has taken a firm stance against the use of dietary supplements in student athletes, it is unclear what impact this position has had. The objective of this study was to compare the use of and attitudes toward dietary supplements by NCAA-regulated student athletes, college students both involved in club sports and not involved in organized athletics.

METHODS

A 16-item survey containing questions about demographics, use of specific dietary supplements, reasons for supplement use, sources of information about supplements, and views about dietary supplement use was conducted among undergraduate NCAA Division I student athletes (DIA), club sport athletes (CA), and students (NA) not formally affiliated with organized athletics at the University of Pittsburgh.

RESULTS

A total of 422 surveys were completed (135 DIA, 116 CA, 171 NA). There was a greater percentage of males among the DIA (56% versus 33%). A total of 60.3% of participants reported using dietary supplements in the last six months, the most common being multivitamins (29%), vitamin C (25%), protein (17%), calcium (16%), and vitamin D (11%). The reasons for use among all participants were to maintain health (28%), prevent illness (23%), provide extra vitamins and minerals in their diet (19%), increase energy (12%) and to treat an illness or health condition (12%). However, DIA were more likely to take dietary supplements to enhance performance than the other two study groups ($p=0.04$). The most commonly used source of information about dietary supplements among all groups was family and friends. Division 1 athletes used their trainers (26%) as the next most common source while CA and NA used health care providers (25% and 29%, respectively) as their next most common source. Participants agreed that dietary supplements were safe, but did not feel they were more effective than prescription medications.

CONCLUSIONS

Use of dietary supplements was common among our study population with family and friends serving as the main source of information. Reasons for use were similar among groups except that Division I athletes reported performance enhancement as a top reason for use, which differed from the club sport athletes and non-athlete students.

Brooke E. Lowry, PharmD

Brooke received her PharmD from the University of Pittsburgh in April 2009. After completing a community pharmacy practice residency at the University of Pittsburgh, she will join the St. John Fisher College Wegmans School of Pharmacy as an assistant professor of pharmacy, with a clinical patient care site at a Wegmans Food Market store in Rochester, N.Y.

Faculty Mentors: Dennis Swanson, RPh, MS; Melissa McGivney, PharmD, FCCP; and Kim Coley, PharmD, FCCP

What if You Build it and No One Comes? Development of a Patient Care Practice - the Role of Needs Assessment

McLaughlin SM, Kozminski ME, Pringle JL, Smith RB, McGivney MS

PURPOSE

We determined the feasibility of providing a new medication therapy management service by evaluating patient perceptions of need, attitudes of potential referring physicians, and pharmacy staff to this service.

METHODS

A qualitative study of key stakeholders was conducted to better understand the medication-related needs of patients from the perspective of patients, physicians and pharmacy staff associated with two independent pharmacies across Pennsylvania. Adult patients with a diagnosis of a chronic disease and/or patients on five or more chronic medications were targeted to participate in focus groups. Patient-focused surveys were used to determine unmet medication related needs. Local prescribing physicians and their staff were interviewed to elicit their thoughts and perspectives on unmet needs in the communities. Lastly, pharmacy staffs were interviewed to assess their perceptions on how the implementation of a patient care practice may benefit their patients and pharmacies.

RESULTS

Preliminary survey results indicate that 55% of patients feel they have no problems with their medications. However, 65% of patients agree that talking with their pharmacist will help them achieve their health goals. Assessment of willingness to pay for a pharmacist service showed patients have difficulty defining a value. A theme from prescribers and physician office staff is that a comprehensive discussion about medications would benefit the patient but there is rarely time in the physicians' office to have this discussion. Future analysis will identify additional key themes from each stakeholder group, which will assist in identifying strategies for successful service implementation.

CONCLUSION

The results of this study emphasize the importance of a needs assessment that includes attitudes and beliefs when developing a new service in the community pharmacy. These results suggest that creating awareness among patients and referring physicians will be important elements in a successful implementation. Pharmacy staff may not see the value in patient centered services, and an education program for staff should be part of the plan.

Presented at the 2010 American Pharmacists Association Annual Meeting and Exposition in Washington D.C.

Shannon McLaughlin, PharmD

Shannon received her PharmD from the University of Pittsburgh School of Pharmacy in April 2009. After completing a community pharmacy practice residency with the University of Pittsburgh and Blackburn's Physicians Pharmacy, she will pursue a clinical pharmacist position with Sunshine Pharmacy, an independent pharmacy chain in Naples, Fla.

Faculty Mentors: Melissa McGivney, PharmD, FCCP, and Randall Smith, PhD

The Impact of Pharmacy Process Changes on Nursing Unit Scanning Compliance

Mulvanity ML, Wasicek KA, Culley CM, Skledar SJ, Mark SM

PURPOSE

Barcode medication administration (BCMA) is an important patient safety initiative. In order for implementation to be successful the technology utilized must be end-user friendly and unit-dose medications must be available in barcode-readable format. Historically many institutions have struggled with successful implementation due to limited scanner device functionality, a lack of available barcode-readable medications from the manufacturer, as well as a failure to recognize the necessary training resources and need for an integrated informatics, nursing and pharmacy support team. A unique approach utilizing centralized distribution of known barcode-readable medications and daily review of barcode scanning failures was expected to increase BCMA scanning compliance across the system hospitals by providing an inventory of ready-to-scan products at the bedside and timely resolution of issues.

METHODS

A retrospective review of inpatient nursing unit scanning compliance rates from a previously implemented system was compared with a newly implemented BCMA application and enhanced pharmacy process changes at a one of the academic tertiary care facilities within a large integrated health-system. Data collection and retrospective review occurred on a weekly basis after an initial implementation wash out period from September - November 2009. Post-implementation scanning compliance rates were compared to rates from September - November 2008. Scanning failures reported via a daily e-mail distribution review were tabulated and categorized.

RESULTS

Aggregate post-implementation scanning compliance rates were 74.5% in September, 80.1% in October and 81.5% in November 2009 compared to 23.9%, 21% and 19.5% respectively, from the previous application in 2008. Additionally, the reported scanning failures decreased over time throughout the study period from 213 in September to 138 in October and 76 in November.

CONCLUSION

New process changes, including centralized distribution of barcode readable medications and daily review of scanning failures, contributed to the increase in medication scanning compliance.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Meredith L. Mulvanity, PharmD, MS

Meredith received her PharmD from the University of Pittsburgh School of Pharmacy in 2008 and an MS degree in pharmacy administration from the University of Pittsburgh School of Pharmacy in 2010. After completing a health-system pharmacy administration residency at UPMC Presbyterian, Meredith will join Arnold Palmer and Winnie Palmer Hospitals in Orlando, Fla., as an inpatient operations coordinator.

Faculty Mentors: Kelley Wasicek, RPh; Collen Culley PharmD, BCPS; Susan Skledar RPh, MPH, FASHP; and Scott Mark, PharmD, MS, MEd, FASHP

Teaching through Collaboration: Measuring Medical Resident Education on a Medication Management Rotation Experience

Owens NW, Farrah RM

PURPOSE

Pharmacist-directed medication management services in an outpatient setting represent a new step toward the concept of the patient-centered medical home. The impact of these collaborations on medical resident education has not been fully explored. UPMC St. Margaret's medication management service has been integrated into the family medicine residency's curriculum for more than 5 years, providing a unique setting for collaborative learning where pharmacy and medical residents see patients together. This research project is being conducted to determine the impact of a one-month medication management rotation on Family Medicine Residents' ability to conduct a complete medication history and their confidence performing the skills described in the core competencies of the medication management rotation curriculum.

METHODS

A prospective pretest/posttest study design is being used to compare family medicine residents' ability to conduct a complete medication history as measured through videotaped standardized patient encounters before and after a one-month collaborative medication management rotation experience. Video reviewers blinded to when the standardized patient encounters occurred will assess the medical residents' performance utilizing a medication history assessment tool. Additionally, medical residents' confidence performing the core competencies of the medication management rotation curriculum will be assessed through surveys before and after the rotation.

TIMELINE

This two-year research project is currently in progress with video taped standardized patient encounters occurring at monthly intervals. The scheduled completion date for this project is June 1, 2011.

Presented at the 43rd Annual Society of Teachers of Family Medicine Spring Conference, Vancouver, B.C., 2010.

Nicholas Owens, PharmD

Nick earned his PharmD from the University of Pittsburgh School of Pharmacy in 2009 and is currently completing a PGY1 pharmacy residency at UPMC St. Margaret. He will be continuing his residency training at UPMC St. Margaret with a second year specialty residency in family medicine.

Faculty Mentor: Roberta Farrah, PharmD, BCPS

Comparison of Pharmacist Versus Physician Management of Inpatient Warfarin Therapy

Prosenjak AR, Wilson LM

PURPOSE

Tight control of the INR reduces the risk of adverse effects due to warfarin therapy, while providing better long-term health outcomes for the patient. Literature supports pharmacist management of warfarin and has shown benefit in anticoagulation control, specifically by documenting fewer INR's greater than 5 and a greater time spent within INR goal range. In July 2007, UPMC Mercy developed a treatment protocol for an inpatient pharmacy warfarin management service. The treatment protocol was developed based on current literature, in conjunction with the CHEST guidelines and was approved by the Pharmacy and Therapeutics Committee. This service has been widely used among the in-hospital rehabilitation population. This study compared pharmacist management versus physician management of warfarin among the in-hospital rehabilitation population.

METHODS

In this pilot study, a retrospective design was used to compare the two treatment groups. Patients were included if they were receiving warfarin while admitted to a rehab floor. They were excluded if they were less than 18 years of age, they did not reach therapeutic INR goal range during length of stay, or they were already therapeutic or supratherapeutic upon admission to rehab or at the time of pharmacy consultation. The primary endpoint was time to reach therapeutic INR (Days). Secondary endpoints included time maintained in therapeutic INR goal range (%) and number of INRs ≥ 4.

RESULTS

No significant difference was shown between those patients managed by pharmacists versus those patients managed by physicians regarding time to therapeutic INR, time spent within therapeutic INR goal range and the number of INRs ≥ 4 that were recorded.

CONCLUSIONS

There was no difference noted in patients managed by our pharmacy warfarin management service and those patients managed by rehab physicians. Additional research with a larger and expanded sample size would be necessary to show a statistically significance difference in the treatment groups.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Amanda R. Prosenjak, PharmD

Amanda received her PharmD from the Duquesne University Mylan School of Pharmacy in 2009. Upon completion of a pharmacy practice residency at UPMC Mercy in 2010, she plans to pursue a career in an ambulatory care setting.

Faculty Mentor: Laura Wilson, PharmD, BCPS

Evaluation of Ceftriaxone MICs for *Staphylococcus Aureus* Isolated from Blood and Sterile Body Sites

Pursglove ML, Freedy H, Hariri R, Yassin M

PURPOSE

Ceftriaxone has a broad spectrum of activity against both gram negative and positive bacteria, including methicillin susceptible *Staphylococcus aureus* (MSSA).Ceftriaxone has been a popular option due to once daily administration and lack of need to adjust based on renal function. As in most hospitals, MSSA susceptibility to ceftriaxone is not routinely performed at UPMC Mercy Hospital laboratory. The Clinical and Laboratory Standards Institute guidelines define MS susceptibility to ceftriaxone as a MIC of ≤8 mcg/mL. Resistance is defined as an MIC ≥64 mcg/mL. At UPMC Mercy MICs for MSSA isolates obtained from patients with osteomyelitis have been ≥ 8mcg/ml. Clinical failures among patients with severe MS infections treated with ceftriaxone have also been observed. The objective of this study is to determine ceftriaxone MICs for clinical isolates of MSSA to help guide treatment decisions and improve patient outcome.

METHODS

Cultures from blood and sterile body sites were included (n=100). *S. aureus* confirmation was done by colony morphology, presence of hemolysis, and catalase and coagulase positive characteristics. Susceptibility to ceftriaxone was assessed using Etest methodology, results of which were interpreted by the same two experimenters throughout the study.

RESULTS

A total of 35 isolates were tested with a median MIC of 6 mcg/mL (2 to >32mcg/ml) and the MIC_{90} was 16 mcg/mL. The median MIC was. According to the CLSI guidelines 28 isolates (80%) were considered susceptible, 5 isolates (14%) intermediate, and 2 isolates (6%) resistant.

CONCLUSIONS

Although approved for use in severe MS infections, early publications document much lower MIC_{90} values than those seen at UPMC Mercy. Even if susceptible as defined by the CLSI guidelines, isolates with MICs > 2 mcg/mL may not be low enough to successfully treat deep tissue infections. Alternative treatment options may be more reasonable if known susceptibility to ceftriaxone is > 2 mcg/mL.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Marci Pursglove, PharmD

Marci received her PharmD from the West Virginia University School of Pharmacy in 2009. Upon completion of a PGY1 pharmacy residency at UPMC Mercy, she plans to pursue a career in a hospital setting.

Faculty Mentor: Henry Freedy, PharmD

Comparison of Effectiveness in Promoting Adherence to Clinical Practice Guidelines Between Quarterly and 72-hour Retrospective DUR Programs

Sadtler AK, Markuss JJ, Tracy CJ, Kubilius J, Legal JD

PURPOSE

To improve clinical and economic outcomes managed care organizations utilize a variety of interventions to promote adherence to clinical practice guidelines. The purpose of this study was to evaluate the effectiveness of two retrospective drug utilization review (DUR) programs (quarterly vs within 72 hours of claim adjudication) in promoting adherence and providing cost savings.

METHODS

A retrospective cohort study was conducted to compare the effectiveness of the two retrospective DUR programs. Interventions targeting the management of asthma, migraines and Alzheimer's disease were the focus. Administrative pharmacy claims data were reviewed from January 1, 2009, through December 31, 2009, for continuously enrolled members of two national employer groups: one participating in a quarterly retrospective DUR program and one in a 72-hour retrospective DUR program. The outcomes measured for both programs were success and cost savings on a daily per member basis.

RESULTS

No significant differences were observed in the success rates between the two programs for interventions focused on Alzheimer's disease, asthma, migraines, and the three as an aggregate (p=0.641, p=0.528, p=0.461, p=0.914, respectively). Retrospective DUR interventions resulted in daily cost savings of $2.54 vs. $3.17 for quarterly and 72-hr DUR, respectively (p=0.058) The average daily cost savings of the Alzheimer's disease intervention were comparable but not significant with $0.28 v $0.73 (p=0.162). Both the migraine ($8.42 v $11.04, p=0.005) and asthma ($1.47 v $1.28, p=0.021) interventions produced significant differences in average daily cost savings for the quarterly and 72-hour DUR programs, respectively.

CONCLUSIONS

While success rates are comparable between the quarterly and 72-hour programs, differences emerge when analyzing the daily cost savings provided by the two. When extrapolated to monthly, quarterly, or yearly cost savings, these differences would be influential in decision making for clinical program offerings of a managed care organization.

Presented at the 22nd Annual Academy of Managed Care Pharmacy Meeting and Showcase, San Diego, Calif., 2010.

Andrea Sadtler, PharmD, MBA

Andrea received her PharmD and MBA from Butler University in May 2009. After completing her residency with CVS Caremark, she will continue to pursue her managed care interests as a clinical pharmacist for a pharmacy benefits management group within Clarian Health in Indianapolis.

Faculty Mentor: Shelby Corman, PharmD, BCPS

Chart Review of Geriatric Outpatients after Quality Initiative to Decrease Unneeded Use of Proton Pump Inhibitor Therapy

Schultz ER, Sakely H

PURPOSE

The goal of this research project is to evaluate patient outcomes from a quality improvement initiative to decrease overuse of proton pump inhibitor (PPI) therapy in geriatric outpatients. Objectives of this study include describing geriatric outpatients taking proton pump inhibitors and assessing the outcomes of those who have their therapy discontinued as part of a quality improvement initiative and assessing potential adverse events associated with long-term proton pump inhibitor use in geriatric outpatients.

METHODS

This is an IRB-approved retrospective chart review of patients in a single clinic. Patients met inclusion criteria if they were seen during three-month enrollment period, age >60 yo, and able to give consent for chart review and follow-up. Through the quality initiative, patients who take PPI's seen during regular office visits are identified to have their charts reviewed once consent is obtained. After this initial enrollment visit, follow-up is conducted through an office visit or audio recorded telephone call at least one month after therapy was to be discontinued. Patient charts are reviewed before and after follow-up to assess for differences between initial visit and follow-up contact.

RESULTS

During the three-month enrollment period, 105 patients were seen at the clinic site for 130 visits and 10 met criteria and were enrolled in the study. Of the 100 patients seen, 73.3% were female, 33% were taking PPI therapies, and mean age was 80.55 years, range 60-100 years. Of those enrolled, 80% were female and age range and average were similar to total patients screened. No definitive characteristics indicating success or failure of discontinuation trial have been determined through the present study due to low number of patients enrolled.

CONCLUSIONS

The overall aim of the quality initiative and chart review is to improve medication use and safety among geriatric outpatients by decreasing use of medication that is not currently indicated and in turn decreasing risk of therapy-related adverse events. In the future, it may be possible to expand this project to nursing home patients and patients in other clinic settings to help decrease side-effect risk, daily pill burden, and unnecessary medication costs.

Presented at the 43rd Annual Society of Teachers of Family Medicine Spring Conference, Vancouver, B.C., 2010, and as poster at University of Pittsburgh Department of Medicine Eighth Annual Research Day, Pittsburgh, Pa., 2010.

Erin Schultz, PharmD

Erin is a 2009 graduate of the University of Pittsburgh School of Pharmacy and a first year pharmacy resident at UPMC St. Margaret. Her practice interests include ambulatory care, family medicine, and care to underserved populations. She will be leaving Pittsburgh to do a second year residency program specializing in ambulatory care at Health Alliance University Hospital in Cincinnati, Ohio.

Faculty Mentor: Heather Sakely, PharmD, BCPS, and Roberta Farrah, PharmD, BCPS

National Survey: Pharmacist Career Ladders

Steinhardt SJ, Skledar SJ, Culley CM, Pringle JL, Mark SM, Saenz R

PURPOSE

Career ladders exist for health care professions and serve the purpose of enhancing career direction, defining the profession, and creating job satisfaction. Pharmacist career ladders have been implemented to define the opportunities for career advancement and offer incentive for pharmacists to pursue careers in hospital pharmacy. To gain insight into national practice, this survey was created to determine the extent of adoption and design of pharmacist career ladders in hospital pharmacies nationwide.

METHODS

An invitation to participate in a nineteen-question on-line survey regarding the use of career ladders in hospital pharmacy was sent to members the ASHP Practice Manager and Clinical Specialist listservs with follow-up reminders at three and six weeks after the initial emailing.

RESULTS

After one month the majority of respondents were from hospitals with ≥ 600 staffed beds (25.3; %); affiliated with a medical school (65.3%); and located within a Metropolitan Statistical Area (65.4%). Hospitals from the Southern region of the United States made up 34% of respondents with 23% from the West, 25% Midwest, and 18% Northeast. Currently, 21% of these hospitals implement a pharmacist career ladder, with 34% offering the ladder ten years or more. Of hospitals without career ladders, 25.6% have plans for implementation. The majority of respondents had one career ladder in place (74.3%): 64.7% Clinical and 67.6% Operational. Meeting pre-established criteria was the most common way to scale a career ladder (83.3%). Years of experience, competencies/examinations, board certification and leadership activities were cited by about 50% of respondents as means of advancement. Commonly adopted rewards included salary increases (81.6%;), increased autonomy and clinical privileges (55.3%), and departmental recognition (47.4%). Of the responding hospitals, 80% report career ladders have improved pharmacist career satisfaction.

CONCLUSIONS

While only 21% of survey hospitals implement a pharmacist career ladder, one-fourth of the non-implementing pharmacies have plans to create career ladders for their pharmacists. Career ladders were considered by 80% of those surveyed to improve pharmacist career satisfaction.

Presented at the 29th Annual Eastern States Conference for Pharmacy Residents and Preceptors, Hershey, Pa., 2010.

Sarah Steinhardt, PharmD, JD

Sarah received her PharmD from the Purdue University School of Pharmacy in 2003 and her law degree from Indiana University School of Law – Indianapolis in 2009. Sarah is currently finishing up the first of two years in a health-system pharmacy administration residency at UPMC Presbyterian.

Faculty Mentors: Susan Skledar, RPh, MPH, FASHP, and Scott Mark, PharmD, MS, MEd, FASHP

Pharmacy Residency Programs

Post Graduate Year 1 (PGY1)

Pharmacy at UPMC Presbyterian Shadyside
Director: Heather Johnson, PharmD, BCPS

Pharmacy at UPMC Mercy
Director: Robert Simonelli, PharmD

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

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

Community Pharmacy
Rite Aid Corporation
Director: Melissa Somma McGiveny, PharmD, FCCP

Managed Care at CVS Caremark
Director: Julie Legal, PharmD

Post Graduate Year 2 (PGY2)

Ambulatory Care at UPMC Presbyterian Shadyside
Director: Deanne Hall, PharmD, CDE

Cardiology at UPMC Presbyterian Shadyside
Director: Amy Seybert, PharmD

Critical Care at UPMC Presbyterian Shadyside
Director: Amy Seybert, PharmD

Drug Information at UPMC Presbyterian Shadyside
Director: Shelby Corman, PharmD, BCPS

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

Oncology at UPMC Cancer Centers
Director: James Natale, PharmD

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

Pharmacy Management at UPMC Presbyterian Shadyside
Director: Scott Mark, PharmD, MS, MEd, FASHP

Transplantation at UPMC Presbyterian Shadyside
Director: Heather Johnson, PharmD, BCPS
Asst. Director: Michael Shullo, PharmD

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