Implementation of a Specialized Pharmacy Team for Overseeing High-Risk Medications During Transition from Hospital to Discharge

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Primary Intended Outcomes
Develop and implement a specialized pharmacy team to ensure patient safety during transition from hospital to discharge, with the focus on high-risk medications.

Relevant PPMI Recommendation
B23. The following characteristics or activities should be considered essential to pharmacist-provided drug-therapy management in optimal pharmacy practice models:

B231. Pharmacists should be involved in the establishment of processes to ensure medication-related continuity of care.

Situation Analysis
In our institution, a 600-bed academic medical center, prescribers use a computer-assisted discharge medication reconciliation process for patients transitioning to a home or other care environment. In early spring of 2010, the lack of an effective mechanism within this process to prevent unintended omissions of important medications upon discharge was brought to light. Polypharmacy was considered a key barrier to achieving accurate medication reconciliation. Therefore, our hospital leaders invited pharmacy staff to provide ideas about how to improve this process. In response, pharmacy staff proposed a specialized pharmacy team to monitor patients on high-risk medications. High-risk medications were designated as agents that, if unintentionally omitted at discharge, could give rise to significant harm during the short interval between the time of discharge and the first post-discharge physician visit.

Service Description
The High-Risk Medication Team (HRMT) was implemented in September 2010 to monitor patients on high-risk medications. Antiplatelet agents (clopidogrel, prasugrel, and aspirin), anticoagulants, antiarrhythmics, and specific anticonvulsants and heart
failure medications were selected as primary targets. Theophylline, dabigatran, lithium, and methotrexate were later added. Once a patient is identified, other medications are evaluated.

Patients are captured through a daily report of target medication(s), cath lab schedules, anticoagulation clinics’ hospitalized patient reports, rescue medications, and flags generated by inpatient pharmacists. Once identified, the HRMT documents the patients’ home medications and medication indications, and notifies outpatient clinics (primarily 10 institutional anticoagulation clinics) of admission. Inpatient medications are reconciled with home medications, and reviewed for monitoring parameters and dosing adjustments during hospitalization. Approximately 100 patients are monitored by the service each day.

Patients pending discharge are identified through the hospital’s on-line bed-tracking system and discharge orders scanned to the pharmacy. Once the HRMT reviews the orders, the prescriber is consulted for additions, possible errors in omissions, and unsafe prescribing conditions. The team follows problems that were not resolved before discharge until the problems have been solved.

The team provides counseling and written material for patients newly started on warfarin, clopidogrel, or prasugrel and notifies case management if the patient has any financial barriers to obtaining medication. Patients who are missed before discharge or who need more counseling are telephoned one to two days after discharge.

Key Elements for Success
1. Dedicated resources and computer access,
2. Support from upper-level and departmental administration,
3. Ability to identify pending discharges timely, and
4. Adequate staffing.

Resource Utilization
Personnel: Three pharmacists.
IT and other infrastructure: N/A
Supply Expense: Salary and benefits for three pharmacists at $130,000 each, totaling $390,000.
Return on Investment: A comparison of the period spanning January through June 2010 (before program implementation) with the period spanning January through June 2011 revealed that hospital admissions decreased 3% and visits to the emergency department within 30 days of hospital discharge decreased 38%.

Recognized Intangible Benefits
We improved coordination of care for anticoagulation patients, pharmacist/prescriber collaboration, prescribing habits and indirectly provided prescriber education, patient satisfaction, and patient education. We were also able to identify financial barriers to medication procurement.
Outcome Measures

1. From January 2011 through June 2011, a total of 5,138 discharge order sets were reviewed. The team had a total of 1,932 contacts with patients as well as inpatient- and outpatient-care providers. The team identified and successfully intervened on 42 unintentional omissions of high-risk medications, including phenytoin, warfarin, clopidogrel, and prasugrel, averaging 7 instances per month.

2. An additional 208 secondary medication interventions (e.g. appropriate dose, duplications, unwarranted addition of medication) were performed, averaging 34 per month. The team discovered more than 60 instances of omitted medications. Other notable interventions included preventing the non-indicated reinstitution of warfarin upon discharge, preventing immediate warfarin resumption in a patient with an INR of 4.2, preventing dual clopidogrel-prasugrel antiplatelet therapy, preventing unintentional dual calcium blocker therapy, preventing unintentional dual beta-blocker therapy, correcting a theophylline dosing interval from every 2 hours to every 12 hours, and a variety of meaningful dose corrections.

3. Other transition-of-care interventions totaled 196, and including correcting a lack of warfarin follow-up arrangement for new-start patients (n=23), lack of lab monitoring (n=42), drug-drug interactions (n=40), medication dosing (n=34), addressing inability of patient to afford prescribed high-risk medication (n=22), medication allergy/contraindication (n=14), unaddressed therapeutic need (n=14), and prevention of adverse drug reactions (n=7).

The vast majority of recommendations were accepted by providers.

4. Patients were counseled on clopidogrel or prasugrel (n=237) and warfarin (n=156).

Lessons Learned

1. Communication with physicians, pharmacists, nurses, and case management helps to prevent interdepartmental discrepancies regarding patient therapy.

2. Initiating a specialized team can greatly expand the pharmacist’s role in medication safety and improve medication accuracy during the transition to hospital discharge.

3. Pharmacy interventions are most effective in transitions of care when potential problems are anticipated and the hospital team is contacted well before discharge.

4. Patient medications should be reviewed shortly after admission.

Other Considerations

1. Weekend and evening coverage is needed as it is difficult to resolve issues after hours (usually after 6:00 p.m.).

Suggestions for Other Hospitals/Health Systems

1. Processes should be dynamic and evolve to meet the needs of your hospital or health system.

2. Gather baseline data for comparison.
3. Set up a system to capture specific interventions and severity of interventions.

4. Provide management with case reports and detailed data to show continued improvement in patient safety and the success of the team.

Helpful References


Team Members

Other key individuals involved in this project were:

- **Renee Overstreet, Pharm.D., BCPS**, Patient Care Pharmacist
- **Lori Jackson-Khalil, Pharm.D.**, Patient Care Pharmacist
- **Qing Xu, Pharm.D.**, Patient Care Pharmacist
- **Holly L. McCollough, Pharm.D.**, MSIA, Patient Care Pharmacist (formerly with Scott and White Healthcare)