Implementation and Evaluation of a Pharmacist-Optimized Education and Transition (POET) Service at a Community Teaching Hospital

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Primary Intended Outcomes

1. Provide pharmacist-led education and transitions of care services to patients located on an intermediate telemetry unit.
2. Expand clinical pharmacy services to improve pharmacist identification and correction of medication reconciliation discrepancies and drug therapy problems.
3. Reduce hospital readmissions and emergency department (ED) visits at 30 days post-discharge.

Relevant PAI Recommendations

B20. Pharmacists should facilitate medication-related continuity of care.
B23. The following characteristics or activities should be considered essential to pharmacist-provided drug-therapy management in optimal pharmacy practice models:

B23k. Medication reconciliation in the emergency department; upon admission, interhospital transfer, and discharge; and in the ambulatory care setting.
B23l. Establishment of processes to ensure medication-related continuity of care for discharged patients.
B23m. Provision of at discharge education to patients.

B24. Every pharmacy department should:

B24b. Develop a plan to reallocate its resources to devote significantly more pharmacist time to drug therapy management services.

E4. The following are critical components in the implementation of optimal pharmacy practice models:

E4c. Ensuring competence of current pharmacy staff to provide drug therapy management.
E4d. Assignment of pharmacists to patient care units.

Situation Analysis

St. Elizabeth Youngstown Hospital is a member of Mercy Health, the largest health care system in Ohio and one of the largest nonprofit health care systems in the United States. The tertiary care, university-affiliated, teaching and community hospital is licensed for 550 beds and includes the region’s only Level 1 Trauma Center. The pharmacy department operates 24 hours a day with approximately 30 professional and 25 supporting staff members. Clinical
pharmacists provide drug information and education to various healthcare professionals and participate in formulary services and policy development, pharmacokinetic and anticoagulant consultation services, pharmacy services in the ED, and patient care rounding with interprofessional internal medicine and critical care teams. The hospital’s pharmacists serve as preceptors for schools of pharmacy in Ohio and the pharmacy department’s PGY1 residency program.

In an effort to expand the pharmacy's ability to assist with transitions of care in the ED, an admission medication reconciliation program was implemented in 2014. In this program, a pharmacy technician and interns work to obtain accurate and complete home medication lists for patients, allowing the ED clinical pharmacist to focus on resolving admission medication reconciliation discrepancies and assisting with direct patient care. During a six-month pilot of the ED program, a total of 19,734 errors were identified and corrected (an average of 3.7 errors per patient). Common errors identified on the admission home medication lists included: missing medications, extra medications that were previously discontinued, and incorrect medication doses. Currently at St. Elizabeth Youngstown Hospital, this program includes one pharmacy technician and 11 pharmacy interns who rotate through an assignment that provides medication reconciliation assistance seven days a week during the hours of 8 am to 9 pm (Monday to Friday) and 10 am to 8:30 pm (Saturday and Sunday). The technician and interns communicate with patients, outpatient pharmacies and providers, and outside facilities to obtain an accurate home medication list. When admission medication reconciliation occurs prior to documentation and review of the home medication list, the technician or intern alerts the ED pharmacist. If necessary, the ED pharmacist contacts the provider to discuss revisions to the current inpatient orders. The program’s success has allowed for expansion of the model to two additional Mercy Health hospitals within the Youngstown region.

After seeing the benefits of the pharmacy's reconciliation service in the ED, the need for improvements with transitions of care at the time of patient discharge from an inpatient hospital stay was identified. The discharge medication reconciliation process requires careful coordination, often involving several specialists and/or hospitalists who may not provide care for the patient post-discharge. It was noted, by the ED pharmacy medication reconciliation staff and clinical pharmacists rounding on patient care teams, that medication reconciliation mistakes made at discharge carried over into the home medication list for the next admission. In late 2016, a pharmacist-optimized education and transition (POET) service pilot program was developed on an intermediate telemetry unit with the highest readmission rate in the hospital. Patients with atrial fibrillation, heart failure, and chronic obstructive pulmonary disease are commonly admitted to this 28-bed nursing unit. Prior to implementation, several of the hospital’s centralized pharmacists participated in a training program led by a clinical pharmacist. Pharmacists were trained to obtain accurate and complete home medication lists, identify and correct medication reconciliation discrepancies, and provide patient education using the teach-back approach at discharge and as new medications are started. The pharmacy department received institutional review board approval to evaluate the effects of the service on the following outcomes: hospital readmissions at 30 days post-discharge, ED visits without admission at 30 days post-discharge, patient satisfaction scores, and pharmacist identification and correction of medication reconciliation discrepancies and drug therapy problems.

**Service Description**

Four pharmacists rotate through one pharmacist assignment (Monday to Friday, 8:00 am to 4:30 pm) to provide education and transitions of care services to patients located on the intermediate telemetry unit. The pharmacist begins each day by attending quality flow rounds with the unit's nursing staff, case managers, and social workers to quickly identify patients with a planned discharge to home, patients beginning a new medication therapy, and patients who require additional education for a medication regimen that is complex or has changed significantly during hospitalization. A patient list in the electronic health record (EHR) is utilized to determine when a discharge order has been placed and a discharge medication reconciliation has been completed by the provider. The patient list also gives the pharmacist the
ability to prioritize patients by a readmission risk score, which is calculated by nursing for each patient on admission using the Geisinger Readmission Risk Assessment screening tool.

Throughout the day, the pharmacist participates in the following core activities for patients with a planned discharge to home: reviewing discharge medication reconciliation to identify and correct unintentional discrepancies, correcting the home and discharge medication lists, identifying and resolving drug therapy problems, and providing patient education on medications that were started, stopped, or changed during their hospitalization. Although the focus is on discharge reconciliation, if time allows, the pharmacist also reviews admission reconciliation for patients who did not have a home medication list reviewed by the ED pharmacy medication reconciliation staff and those patients with a home medication list or admission medication reconciliation that is not marked as complete in the EHR. Additional activities involve identifying and overcoming barriers to medication access post-discharge. This includes assisting with the pharmacy's growing meds to beds program.

A progress note is documented in the EHR by the pharmacist at the time of initial chart review to outline the medication changes that have occurred during the hospitalization and to record the transitions of care activities that were completed by the pharmacist (e.g., review of home medication list and/or admission medication reconciliation, correction of home medication list, patient education on home medication changes and new medications, review of discharge medication reconciliation, review and customization of the patient discharge medication list handout, and patient education at discharge). The progress note can be copied in the EHR and updated throughout hospitalization when new medication information is obtained and additional pharmacist activities are completed, which helps to avoid redundant activities between the pharmacists as they rotate through the assignment. The pharmacist also documents medication interventions in the EHR for pharmacy department tracking using the following categories: patient education, medication reconciliation, drug discontinuation or initiation, drug therapy change, dosage adjustment, and miscellaneous. Patient education materials prepared by the pharmacy department are stored on the hospital's intranet system and are printed on the nursing unit as needed.

**Key Elements for Success**

1. The development of a dedicated pharmacist assignment is necessary to consistently provide the transitions of care and patient education service. The pharmacist scheduled for the assignment is present on the nursing for the entire shift. Previously, the pharmacy department’s attempts to provide this service were less successful when the model included pulling pharmacists from other assignments during slower order verification periods;

2. An organized training program is necessary for pharmacists prior to participation and as program changes occur;

3. Pharmacists must understand and complement the current nursing unit workflow to communicate effectively and facilitate efficient patient discharge;

4. The program must establish a process for timely identification of patients who will be discharging in order to maximize the time available for pharmacist reconciliation review and patient education. The program must decide if the pharmacist will prioritize their time by focusing on specific patient groups, such as patients with a higher risk of readmission.

**Resource Utilization**

**Personnel:** One dedicated pharmacist assignment (currently at our hospital, several pharmacists rotate through this assignment using the current staff); an existing clinical pharmacist was scheduled time to serve as the program coordinator for service development, pharmacist training, and data collection/analysis.

**IT and other infrastructure:** Computer workstation on the nursing unit; access to the EHR (EPIC®) and hospital intranet to retrieve patient education handouts and utilize online drug information software; wireless internet protocol (IP) network phone; nursing unit printer for patient education materials; software for data collection and analysis (Microsoft® Excel).
Supply Expense: Pill boxes were purchased by the pharmacy department. The pharmacist suggests use of a pill box to patients who have complex medication regimens and/or a history of noncompliance.

Return on Investment: Decrease in hospital readmissions and ED visits at 30 days, improvement in nursing unit patient satisfaction scores, and increased pharmacist identification and resolution of medication reconciliation discrepancies and drug therapy problems.

Cost savings related to avoided patient admissions and ED visits are estimated at $851,000 per year. In addition, estimated savings from the accepted pharmacist medication interventions is approximately $1,000,000 per year. Therefore, total cost savings for the program are $1,851,000 per year, resulting in a program savings benefit that is 13.9 times the cost of providing the service. Of note, estimated savings related to pharmacist interventions are substantiated by a hospital finance report showing a decreased length of stay and reduction in cost ($890,000) for patients involved in the pilot program. The results of this pilot program support continuation and expansion to additional hospital nursing units.

Recognized Intangible Benefits
The pharmacy department has received positive feedback on the service from patients, nurses, and providers. The program has resulted in further pharmacy decentralization and expansion of clinical pharmacy services to additional patients and a telemetry nursing unit that was previously without a dedicated clinical pharmacist. Pharmacists’ face-to-face interactions with providers have increased, and pharmacists participating in the program have experienced increased job satisfaction. The program also now serves as an additional training environment for pharmacy residents and students, who can serve as pharmacy extenders to increase the number of patients reached by the program. Student feedback on the program has been very positive, and expansion of pharmacy resident participation is planned.

Outcome Measures
During a seven-month pilot period (December 2016 to June 2017), pharmacists interacted with 497 patients. The patients were followed by the program coordinator for 30 days post discharge and the following outcomes were evaluated:

1. **Identification of unintentional medication reconciliation discrepancies**: Pharmacists identified 336 unintentional discrepancies on discharge medication reconciliation. Of these discrepancies, 217 were due to inaccurate information, and 119 were due to incomplete information. Examples of discrepancies due to inaccurate information include: extra medications and an incorrect medication dose, frequency, route of administration or dosage form. Examples of discrepancies due to incomplete information include: missing medications and missing medication dose or frequency. Discrepancies were caused by physician reconciliation errors (51.3%), history errors due to incomplete or inaccurate home medication information (17.8%) or a combination of reconciliation and history errors (30.9%).

2. **Identification of drug therapy problems**: Pharmacists solved 392 drug therapy problems, including correction of reconciliation discrepancies, with a provider recommendation acceptance rate of 90.6%. Pharmacist recommendations to solve drug therapy problems included: drug discontinuation, drug initiation, therapy change, and dose change. Pharmacists classified 126 drug therapy problems (32%) as significant enough that an adverse event or readmission was probable if appropriate action was not taken.

3. **Readmission rate**: The 30-day readmission rate for the pilot program patients was 23.4%, compared to a 31.8% baseline for the nursing unit in 2016, resulting in a 26.4% reduction. Readmissions per patient decreased from 2.35 to 1.26 readmissions per patient, which was a 46.4% reduction.
4. **ED visit rate**: The 30-day ED visitation rate (without admission) was decreased from 40.7% in 2016 to 11.8% for the pilot program, which was a 71% reduction.

5. **Patient satisfaction**: HCAHPS survey scores improved during the pilot period by an average of 14% for the following categories: overall rating of the hospital, communication with nurses, help from hospital staff, communication about medications, discharge instructions, and care transitions.

**Lessons Learned**

1. Work days were very busy for the pharmacist and could be challenging at times, as each patient had unique discharge needs. It was helpful to train and utilize several pharmacists who could rotate through the pharmacist assignment to prevent pharmacist fatigue in this role.

2. Pharmacists were required to develop a better understanding of case managers’ and social workers’ roles on the nursing unit in order to collaborate effectively to overcome discharge medication therapy barriers in a timely manner.

3. It is helpful to discuss program development and outcome measures with hospital administration early in the planning stage to ensure that the most important patient population to target and the most valuable data to collect have been identified and agreed upon. Our initial program targeted all patients on one telemetry nursing unit with a plan to discharge to home. However, we are currently discussing the possibility of program modification to target specific patient groups on several nursing units, such as patients with high readmission risk scores or a disease state associated with the Centers for Medicare and Medicaid Services readmission penalties.

**Suggestions for Other Hospitals/Health Systems**

It is helpful to designate a program coordinator to develop the program structure and provide consistent training to participating pharmacists, residents, and students. The coordinator can also serve as a point person to assist with pharmacist questions and discharge issues that may occur. In the early stages of program implementation, it is important to allow adequate time to collect and analyze outcome measures to support the current program and justify program expansion. The program coordinator can also assist with these activities.

Incorporating a post-discharge follow-up component to the transitions of care program, such as a pharmacist visit and/or telephone communication after discharge, may increase the success of the program. We are planning to eventually add this service to our program and evaluate the additional benefits.

**Helpful References**


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