Redesigning the Work of Case Management: Testing a Predictive Model for Readmission

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The rising cost of healthcare, along with pay-for-performance and bundled-payment initiatives, have affirmed the importance of case management in today's healthcare market.[1] The Healthcare Reform Act[2] in conjunction with the Institute for Healthcare Improvement white paper, A Guide to Measuring the Triple Aim,[3] encourages healthcare agencies to provide higher-quality care at a lower cost.[2] According to Cesta,1 case managers have historically functioned as gatekeepers regarding patient length-of-stay (LOS) and cost per case. "The cost of inpatient utilization is commonly cited as the largest driver of healthcare expenses."[4] While LOS and cost of care remain important components of the case manager's responsibilities, at present they have evolved to a much broader role that includes prevention of readmissions. Medicare beneficiaries readmitted to hospital within 30 days of discharge are thought to cost the healthcare system $17.4 billion annually.[5] In today's hospitals, case managers are being asked to address this issue with systems and processes developed for discharge facilitation models. Unfortunately, case managers and healthcare leaders are realizing a disconnect with the new and ever-changing expectations.

Background

Readmissions can signal low-quality care or follow-through, can negatively affect healthcare resources, and may diminish patient satisfaction.[1] Effective October 2012, the Secretary of Health and Human Services (HHS) identified 3 National Quality Forum (NQF)-endorsed 30-day readmission standards: 1) acute myocardial infarction (AMI); 2) heart failure (HF); and 3) pneumonia. QualityNet,[6] a government website, identifies reduction of inpatient prospective system payments to hospitals for excessive readmissions associated with the 3 NQF-endorsed groups. As a result, case managers have globally added prevention of readmissions to their responsibilities. Patient safety related to care transition is historically a focus of their role; however, the quality and consistency of patient handoff of information may be out of their span of control.

Project Development and Implementation

In an effort to improve patient safety and meet HHS readmission requirements, case managers at Baptist Health Lexington recognized the need to move beyond the traditional case management roles and activities related to discharge planning, utilization review, and LOS management. A review of the literature revealed the following causes of hospital readmission; a) no patient-provider follow-up within 7 to 10 days; b) poor patient compliance with medication regimen; c) patients' confusion regarding management of their disease process; and d) a lack of home care services.[4]

Based on Kreilkamp's[7] modification of the LACE (length of stay, acuity, comorbid conditions, and emergency department visits) risk tool, a new case management model was developed at this 383-bed Magnet redesignated community hospital. Kreilkamp's modification of the LACE tool, including assigned scores, was used. This model, Baptist Health Case Management Model (care utilization pathways, or CUP), is patient centered and organized around the 3 major components of quality care, cost, and care delivery. These 3 components incorporate care transition planning, utilization review, and communication pathways (**Figure 1**). The modified LACE, a psychometrically sound instrument,[7] identifies patients who pose a strong risk of readmission based on an objective scoring system (**Table 1**). Research to date suggests that the modified LACE index can accurately identify individuals who are likely to be readmitted within 30 days of discharge.[8]

In addition to identifying patients with greater risk of readmission, using the CUP model case managers intervene by (a) assuring that the planned provider follow-up occurs post discharge, (b) assuring that patients understand their medication regimens, (c) helping the patient and family members to understand the patient's disease process, and (d) referring to home care or other support services when appropriate. The modified LACE discharge assessment tool (Figure 2) addresses the usual causes of readmission with preventive counseling and education. It also encourages the case managers to think critically regarding individualized patient discharge needs.

Project Team

According to the literature describing the use of the LACE tool,[7] a paper version is generally used, although the tool can be adapted to be electronic. If on hard copy, staff must input values and calculate the LACE index score into a final composite score. At Baptist Health Lexington, an automated approach has been developed that calculates the LACE index score at the patient level through the hospital intranet, identifies patients with LACE Index Scores at the threshold value of $\geq$7, and populates within a common shared electronic folder for case managers (majority at the BSN or MSN level) to view. A decision support analyst developed a) the database using internal software, b) the reports required to extract the needed data elements for the calculations, and c) the report retrieved daily by case management. Identified through our pilot program, receiving reports in a timely fashion is important in order to develop appropriate plans for transition of care for patients. While the modified LACE risk tool is used for all adult and pediatric patients at this hospital, neonates, hospice patients, and patients who are mentally incapacitated with state guardianship are excluded due to variable hospital stays.

Baseline Data

The daily modified LACE risk report initially identified patients who had a composite modified score of 10 or greater (maximum score of 19). Examination of data collected 90 days post model implementation resulted in lowering the capture score to 7 or greater. During the first 90 days readmissions were slightly reduced, by an average of 6%. Analysis of the data showed that scores for a number of the patients readmitted to the hospital fell between modified LACE scores of 7 and 9. Lowering the score to 7 created a larger "at-risk" population, which ultimately resulted in a greater decrease in number of readmissions (50% reduction).

Identification of at risk for readmission patients enables case managers to use their time more effectively. They can focus on issues related to at-risk patients, potentially preventing readmissions. A case work list is generated each day per the case manager's clinical unit and/or hospital bed assignment. The automated Decision Support LACE report is delineated by clinical area and sorted by room number so that case managers can readily identify their at-risk patients.

Unfortunately, as readmissions decrease the denominators and numerators may also decrease, thus making it more difficult to meet Centers for Medicare & Medicaid Services (CMS) benchmarks. For example, a case manager might see 57 AMI cases in a given month and 10 patients might be readmitted within the 30-day period. The readmission rate is ~17%. Given efforts to reduce readmissions, the following month case managers might see 37 AMI cases and 7 might be readmitted. The readmission rate rises to 19%, although cases have been reduced by 20 (35%). This issue results from the current federal reporting system. Changing the dynamics in healthcare[9] indicates that the federal reimbursement system recognizes and rewards efficiency, but often overlooks or minimizes quality efforts within bundled payments structures (p 57).

Program

Effective transition from hospital to home or supportive agency is a major component of this case management model. The case manager ensures that ongoing support during the transition period is available. Nursing research personnel assist with identifying evidence-based practice elements, while ancillary staff incorporates key triggers resulting in appropriate ancillary referrals (eg, social services, pharmacy, respiratory, and cardiology navigators). Additional triggers such as homelessness, limited income, or prescription of 15 or more medications are also used by case managers to increase awareness regarding the possibility of readmission and were identified as an additional data source within the pilot.

On the day of admission patients, as well as family members and caregivers where appropriate, are given information regarding the reason for hospitalization. A description of expected signs and symptoms post discharge along with helpful interventions is also provided. Case managers help patients and caregivers understand when they might need to dial 911 or call their private physician. They make certain that patients have their follow-up physicians' contact information and will make appointments if necessary. On the day of discharge a summary of the discharge instructions is reviewed and time is allotted for a question/answer session.

At the time of discharge a clinical pharmacist meets with patients to identify those medications that are discontinued (placed in a red bag) and medications that should be continued (placed in a green bag). The pharmacist reviews the medications that will be continued in order to identify potential dosage issues, discuss possible concerns regarding the cost of medications, and detect any drug-drug interactions.

The patient receives a medication calendar that lists brand and generic medication names as well as when and how to take the medication. The patient is encouraged to bring the calendar during provider follow-up. The

Baptist Health CUP model, in keeping with federal recommendations,[10] focuses on cost savings for patients. For example, prescribing a medication that combines an angiotensin-converting enzyme inhibitor and a diuretic rather than having patients purchase these drugs separately may be financially beneficial to the patient.

Outcomes

Acute-care case management typically ends at the time of patient discharge. The Baptist Health CUP model continues, with limited responsibility, throughout the continuum of care. Model success has been demonstrated with admission reductions (see **Figure 3**) and is dependent upon individualized patient discharge planning as well as adherence to the discharge plan by both the case manager and the patient. Data from the first quarter, calendar year 2012, reflect readmissions prior to the implementation of this model.

Three χ^2 tests were conducted in order to determine if readmissions based on diagnostic type (AMI, HF, and PN) were associated with time period (quarter 1, quarter 2, and quarter 3 in 2012). A significant association was found between PN readmissions and time period [χ^2 (n = 126), $P = .05$] where readmissions decreased over time. No significant associations were found between AMI readmissions and time period [χ^2 (n = 145), $P = .07$] or between HF readmissions and time period [χ^2 (n = 170), $P = .29$]. However, readmissions according to these 2 diagnostic criteria also decreased over time (Figure 3).

In summary, prior to the development of the CUP model, standardized triggers to initiate case manager consults were based on traditional risk factors for readmission. Most of the triggers stemmed from social support issues identified by the admitting nurse. Case management intervention occurred based on the individual nurses' knowledge and/or practice patterns. Typically, discharge instructions occurred on the day prior to or the day of discharge. Patient quality care needs and discharge disposition now drive the majority of discharge planning, starting with the admission of the patient to the system. Acute-care case management typically ends at the time of patient discharge. The Baptist Health Case Management CUP model begins education with discharge planning on the day of admission.

The modified LACE risk tool identifies patients with greater readmission risk. The model provides a support system for 30 days post discharge, encouraging patients and families to contact case management for questions or concerns during the days that follow discharge. To date the model has shown success in the reduction of readmissions and has been implemented across the Baptist Health consortium (7 facilities). Success of this model assures that Baptist Health Systems delivers optimal care while receiving the maximum CMS incentive pool, estimated at ~$2.8M in 2013, ~$3.6M in 2014, ~$4.3M in 2015, and ~$5M in 2016.