Evaluation of prescriptive analytics to reduce length of stay through targeted pharmacy services in an acute care practice model

Abstract

Purpose:
Advanced pharmacy practice models that foster pharmacists’ leadership and accountability for patient outcomes are an imperative for the pharmacy profession. Institutions continue to be challenged with how to organize and deploy resources to achieve impactful outcomes. Length of Stay (LOS) is a clinical outcome metric used to represent efficiency in healthcare. Prescriptive analytics represent an opportunity to advance patient care opportunities in the acute care setting, which has not to our knowledge been utilized to address LOS. UNC Medical Center (UNCMC) has a knowingly extended LOS, as compared to similar hospitals through Vizient, previously University Health Consortium (UHC). A previous study utilized descriptive and predictive analytics to identify service lines with LOS above target within UNCMC, and to determine which service lines have the highest opportunity for pharmacy impact. Through prescriptive analytics, clinical pharmacy interventions can be deployed in targeted areas to maximally reduce extended LOS and increase patient throughput and efficiency to minimize ongoing bed capacity issues at UNCMC. With the increased need to provide value-based care, service lines with identified extended LOS represent the ideal target for a novel pharmacy driven LOS Program in the acute care setting. The objective of this study is to evaluate the impact of a LOS Program integrated into a pharmacy practice model in the acute care setting on organizational, patient, and financial outcomes.

Participants:
The LOS Program will be launched in four UNCMC service lines, which have an identified extended LOS and high opportunity for pharmacy impact. Four pharmacists (n=4) will be targeted to enroll in the pilot phase.

Procedures (methods):
A quasi-experimental design with mixed methods will be utilized to compare the effect of the LOS Program in the piloted services before and after implementation. Patients previously admitted to these services will serve as comparative, historical controls in a time-series design. The pilot period will extend for three months. Core elements of the LOS Program include pharmacy services differentiated by patient-specific needs, interventions determined through prescriptive analytics, development of a LOS dashboard, discharge services, and comprehensive documentation. Organizational and financial performance metrics including LOS, patient adverse events avoided, and inpatient days saved will be ascertained from existing electronic records within the organization. Clinical pharmacists who execute the pilot study will complete a 60-minute face-to-face semi-structured interview regarding their experiences with the program.

Data analyses will be performed through collaboration with a biostatistician. Descriptive statistics will be utilized to characterize patient demographic data and intervention type for the targeted population. Quantitative statistics (paired t-test, chi-square, etc.) will be utilized to assess acute care bed capacity and length of stay. Data will be presented as mean±SD for continuous variables and percentages for categorical variables, unless otherwise noted. Subgroup analyses will be performed by service line. Qualitative data will be analyzed using thematic coding with a constant comparative approach to identify categories that characterize pharmacist perception of the LOS Program.