Using Technology to Improve the Admission and Discharge Process

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Introduction

The senior directors at Naval Medical Center San Diego (NMCSD) were continually receiving calls because of bottlenecks in the movement of patients. Most members of the health care team were frustrated because there was no central dashboard or site that displayed real-time bed status throughout the medical center. In addition, the inpatient nursing staff voiced concerns over not receiving the patients' admission products (medications, wristbands) before or shortly after the patient arrived at the admitting ward. The Pharmacy Department had to modify the standard process by which medications were dispensed, because of the delays around patients being admitted into the Composite Health Care System (CHCS). This revised process meant that several medication safety features were aborted, thus increasing the probability of errors in dispensing medications. The Lean Six Sigma (LSS) team soon realized that these delays encouraged admitting providers to intentionally delay transferring patients from the emergency medical department (EMD) because they were trying to ensure that their patients would receive timely critical medications, laboratory tests, and examinations. The LSS team requested a data pull from the M2 database to assess the baseline of patient movement. The data pull showed patterns of patient admission and discharge movement that were inconsistent with standard admission and discharge times at NMCSD. Thus, the LSS team came to the conclusion that most of the data was not valid and processes had to be developed to ensure that patient admission and discharge movements were accurately recorded.

The proposed goal of the project was to ensure that 85 percent of the adult medical center patients admitted from the EMD were admitted into CHCS within 15 minutes and that 95 percent were admitted within 30 minutes. In addition, we had to ensure that 85 percent of the adult medical-surgical patients were discharged from CHCS within 15 minutes after the inpatient medical-surgical nurse discharged the patients from Essentris and that 95 percent were discharged within 30 minutes. The objective was achieved by creating a dashboard allowing staff in the Patient Administrative Department (PAD) to acknowledge when a provider in the EMD had green-lighted a patient admission. The dashboard provided the information needed to admit the patient into CHCS. The second objective was achieved by creating a dashboard that provided the necessary information to discharge a patient from CHCS and allowed PAD staff to acknowledge when an inpatient medical-surgical nurse had discharged a patient from Essentris. In addition, there was a back-end reporting feature for both dashboards that allowed the LSS team and managers to track time elapsed between the admission and discharge events and the recording of the events in CHCS. The initial average time and compliance rates were 18 minutes and 60 percent, respectively, for the admission, and 1,048 minutes and zero percent, respectively, for the discharge process. Twelve weeks after reviewing the reports and implementing process changes, the compliance rates were 96 percent for admissions and 95 percent for discharges.

Methods

In November 2010, the command chartered an LSS project to improve these aspects of the patient flow process. After creating flowcharts, conducting a failure-mode analysis, and performing a cause-and-effect exercise, we identified two root causes: delays in admitting and discharging patients into CHCS after the actual events had occurred and were documented in Essentris. Thus, the goals of the LSS project were to ensure that most patients were being admitted into CHCS within 15 minutes after the admitting provider in the EMD completed the authorization for admission. In addition, we wanted to ensure that patients were discharged from CHCS within 15 minutes after the inpatient medical-surgical RN had discharged the patients from Essentris. Because the PAD staff has several responsibilities, we had to develop a tool that would allow them to track real-time admission and discharge events occurring throughout the medical center. Due to the large scope of the problem, we narrowed our aim to a focus on patients within the medical-surgical project line.

The initial LSS team was composed of a medical-surgical clinical nurse specialist (CNS) , an inpatient ward division officer, an IT Essentris expert, a general surgery and medical resident, a pharmacist, an outpatient nurse, a social worker, a PAD manager, an EMD CNS, and the project sponsor medical-surgical nurse director. This team created the process flowcharts of medical-surgical patients and participated in the failure-mode analysis and cause-and-effect exercise. Once the team had redefined its goals to focus on improving the CHCS admission and discharge entry times, we revised the team to include an EMD CNS, three IT personnel (Essentris and CHCS experts), three PAD managers, and the PAD division officer. The project champions included the directors of surgery, medicine, and nursing.

We believed one root cause of problems was the electronic medical record systems — Essentris and CHCS. Both applications require different skills, and the environment appeared to differ for the end users. Thus, most members of the clinical health care team were comfortable navigating and completing tasks in Essentris, but few clinical staff could navigate or complete tasks in CHCS. Most staff in health care administration felt comfortable with CHCS and not with Essentris. In addition, there was a limited flow of information being shared among nursing, PAD, EMD, and IT support staff regarding issues that affected patient flow. Given these challenges, the team felt that the IT team had to build an application that could bridge the Essentris and CHCS information/functionality gap. This was not the only issue. There was much inconsistency in how the various medical-surgical wards moved patients in Essentris and with operational definitions of patient-flow terms, such as transfer onto ward (TOW). When the nurses discharged a patient before completing the documentation, the method by which the nurse placed and then later removed the patient data in Essentris varied greatly among the medical-surgical

wards. Therefore, the LSS team had to hold several meetings with key nursing staff to standardize patient flow terminology and execution of the inpatient medical-surgical discharge process in Essentris.

We had to incorporate members from IT who were familiar with Essentris and CHCS. First, the IT personnel — who were familiar with Essentris — generated a dashboard that would allow the PAD staff to acknowledge an admission and have critical patient information that would allow the PAD staff to admit the patient into CHCS. We then had the IT Essentris and CHCS resident experts create back-end reports that would measure the time elapsed between the entry of admission and discharge events into Essentris and the same entries into CHCS.

When we ran the first report, the mean average delay in CHCS admission time was 18 minutes, with a compliance rate of 60 percent. During the first four weeks, it was not unusual to have five to eight patients who were delayed by three to four hours. The discharge data showed an average 1,048 minutes of delay with zero percent compliance. Within the first four weeks of running the reports, it was not unusual to find 10-12 patients who were not discharged within the week. We then found that the driver for the discharge process was Chart House or Coding Department personnel calling nursing or PAD staff to discharge the patient. If they were not able to contact nursing or PAD in a reasonable time, the Chart House or Coding Department staff would discharge the patient on their own. We had to work with PAD, EMD, and nursing to provide education and counseling to reduce variation throughout the process. To accomplish this, we had to educate and provide support with process change, business rules for using the dashboards, coordination of actions, and review of the reports and to standardize processes within the respective departments. In addition, we had to make several revisions to the dashboard and review report functions to ensure that the data was valid. That was accomplished through several scheduled meetings and emails among the PAD, IT, EMD, and nursing staff. The most conclusive changes occurred when the respective managers in the PAD team reviewed each noncompliance event with their staff and made adjustments accordingly.

Results

After implementation of the reporting dashboards between PAD and the EMD and PAD and nursing, we soon learned that much education and coordination of effort had to occur before we could meet our goals. In addition, we had to revise both the dashboard and the back-end reports to ensure that the PAD staff was getting timely data and that the back-review report was providing valid data. The admission measure looked at the time elapsed between the EMD provider completing the online authorization for admission in Essentris and the PAD staff admitting the patient into CHCS. The metric was measured in minutes. The discharge measure looked at the time elapsed between the medical-surgical inpatient nurse discharging the patient from Essentris and the PAD staff changing the disposition in CHCS to “discharge.” Each week the LSS team would obtain weekly data detailing both performance measures using the back-end review report. We placed the data in a histogram showing the dispersion of the data and the mean (average) and then calculated the percentage of compliance. We analyzed the entire population of patients for the reporting period. For clarity, we dropped outliers, with the goal of keeping

the histogram bins at intervals of 15 minutes. Here, the manager could clearly see how many patients were entered into CHCS within 15 minutes of being admitted to the EMD or being discharged from the medical-surgical wards. We then sent the data to the PAD managers and division officer, EMD CNS, IT personnel, project sponsor, and champions. We also attached spreadsheets of the data so the PAD managers could investigate outliers and discharge any patients who were not discharged within the week. We met weekly — PAD team, EMD CNS, and IT staff — to discuss revisions to the dashboard and to review report tools. This was followed up with phone calls and several email chains discussing issues. Within 12 weeks of running the first reports, the admission mean time of CHCS entry delay was 11 minutes, with a compliance rate of 96 percent, and the discharge statistics were 1 minute and 95 percent, respectively.

Conclusion

This LSS project was time and work-intensive; yet it was extremely necessary because of its impact on patient safety and satisfaction, the health care teams' satisfaction with their work experience, and the efficient use of command resources. The success of a project of this nature requires dedicated members of the IT department who have experience with how the various departments use Essentris and CHCS and IT members who can create Essentris and CHCS reports. To hardwire the process, we need to ensure that key leadership members, of the involved departments, communicate when they encounter problems. Each department must educate new staff to ensure that they have an understanding of the overview of the admission and discharge process and to standardize how the members of each department execute the documentation of patient movement through NMCSD within Essentris and CHCS. More important, management must periodically review reports on the average patient delay time and look at what role their staff plays in the delay. We feel that this solution can be replicated at other sites if senior leadership makes improving patient flow a high priority and empowers a well-resourced team to methodically improve the process.