Columbus Regional Hospital (CRH) is a 325-bed hospital providing care to a 10-county service area surrounding Columbus, Indiana. CRH offers comprehensive services including acute care, emergency care, surgery, cancer care, birthing center, cardiac services, rehabilitation, a wide range of outpatient services and programs, psychiatric services and wellness services.

Since 2005, CRH leadership has been integrating Lean Sigma performance improvement into the way they do business. Understanding the hospital as an inter-dependent network of departments and activities, the program concentrated on linking and sequencing Lean Sigma projects across the organization.

Project Background

Patient satisfaction surveys revealed that fewer than half (47.6 percent) of discharged patients rated the timeliness of the discharge process as “Very Good”. A preliminary review of the discharge process revealed that much of the work was being deferred until the day of discharge. An improvement in the discharge process will result in:

- Nursing staff: less time spent on the discharge process, more hands-on time with patients, and more time for personal development.
- Finance: cost savings from decrease in supply costs
- Patients: improved satisfaction with timeliness of discharge process; less wait time in ED for bed availability
- ED/Surgery: increase in surgical and emergency department capacity by providing timely access to inpatient bed; assured continuity of care through prompt transfer to the nursing unit.

The project focused on patients discharged home from an acute care Medical/Surgical floor. The project leader anticipates rolling out the improvements to other areas once results are validated.

The project was managed by a Black Belt following the DMAIC (define, measure, analyze, improve, control) roadmap. A cross-functional team supported the efforts. Classroom training and project mentoring were provided by SBTI.

By evaluating the quantity produced and the cycle times, it became clear that Step 2 is the bottleneck of the process. This was one initial focus as it is the pacing item in flow of the entire process.

Measure Phase

The key measure for this process is the cycle time from the physician telling the patient(s) he will be discharged until the bed is available for the next patient. In the baseline period, the average time was 202 minutes.
There are two secondary measures. One is the measure of patient satisfaction as described above. The second is the cost of non-chargeable items (dressings, etc.) sent home with the patient upon discharge. The rate at baseline was $37.17 per discharged patient with a 20% reduction goal of $29.74. Multiplied over the number of discharges from the study floor, the projected savings to the hospital from non-chargeable supplies exceeded $64,000.

Analyze Phase

The team used a detailed process map and a Failure Modes and Effects Analysis to further study the process. These helped to identify areas of risk in the process and were used to find possible root causes of failure.

Improve Phase

Based on the findings, the team revised the discharge process, loading more actions earlier in the patient’s stay.

1. **During Pre-Admission Testing (PAT), surgery patients:**
   - Learn the anticipated discharge date and time
   - Receive pre-printed discharge instructions, including supplies needed at home after discharge and where to purchase them

2. **During inpatient stay:**
   - Patients with one of five top medical diagnoses receive pre-printed discharge instructions
   - Anticipated discharge date and time is communicated to physician(s), staff, patient, and patient’s family (important because the primary reason patients don’t leave when ready is because the ride is not available)
   - Nursing ensures education, hygiene addressed before discharge day, the bath being offered to the patient by the evening shift nurse the day prior patients were still assisted with “minor” hygiene care the day of discharge
   - Patients pre-purchase supplies for use at home

3. **On day of discharge:**
   - Night shift nurse notes any last day education needs
   - Discharge nurse, in “protected” status completes discharge process:
     - Assure medication reconciliation
     - Complete discharge instructions
     - Arrange physician follow-up
     - Update PAM
     - Call physicians, if necessary
     - Provide final education
     - Assemble 2 days worth of patient home dressing supplies
   - Attending physician confirms medication reconciliation is accurate
   - Unit Support Partner (USP) assembles discharge packet with:
     - Orders
     - Instructions

Figure 1 - High Level Process Map
4. If patient is discharged sooner than expected:
   • USP prompts entry of discharge orders
   • The chart is flagged by the attending physician

Control Phase

A control plan was put in place to ensure that these improvements would continue in the future. Control charts were used to monitor ongoing performance of the key variables. With a highly people-dependent process, the control chart can be an essential tool to verify compliance.

Conclusion and General Results

Using the Six Sigma methodology and DMAIC roadmap, the project team greatly reduced the cycle time required to discharge patients from a baseline average of 202 minutes to 115 minutes. In addition, within a few weeks of implementing the changes, patient satisfaction with timeliness of the discharge process improved from a baseline of 47.6% indicating “Very Good” to 76.0%. Finally, the team was able to reach the target of $29.67 for the cost of non-chargeable items per discharge, resulting in substantial savings to the hospital.

A particularly obdurate issue, waiting on ride time, continues to perplex the team and accounts for most of the variability in current discharge time. The team is working on this issue as well as rolling out the changes to the rest of the hospital.

References: