

Improving Inpatient Discharge Cycle Time and Patient Satisfaction

An SBTI White Paper

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.



Figure 1 – High Level Process Map

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. One 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
 - Face Sheet
 - Portal
- Care Partner dresses patient and gathers supplies, takes patient to car when ride is ready

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.

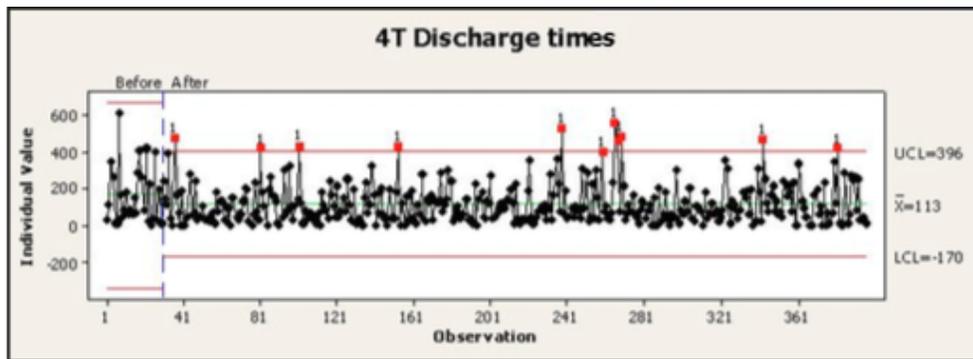


Figure 2- Control Chart

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:

1. Wedgwood, Ian. *Lean Sigma: A Practitioner’s Guide*. Prentice-Hall: Upper Saddle River, NJ, 2006.

2. Zinkgraf, Stephen. *Six Sigma: The First 90 Days*. Prentice-Hall: Upper Saddle River, NJ, 2006.

Method

West Georgia Health began by chartering a project that included team members from all impacted areas, which included a Hospitalist, ED Manager and Director, Floor Nurses, Pharmacists and IT. The project was scoped to focus improvements on the floor, but was given permission to explore improvements in the ED. It was determined that a five-day event should be sufficient to permanently solve this problem given the dedicated participants.

The team was taught basic Lean principles to understand the importance of identifying waste and improving flow. Initially the Hospitalist and ED members were asked to join only part of the five-day

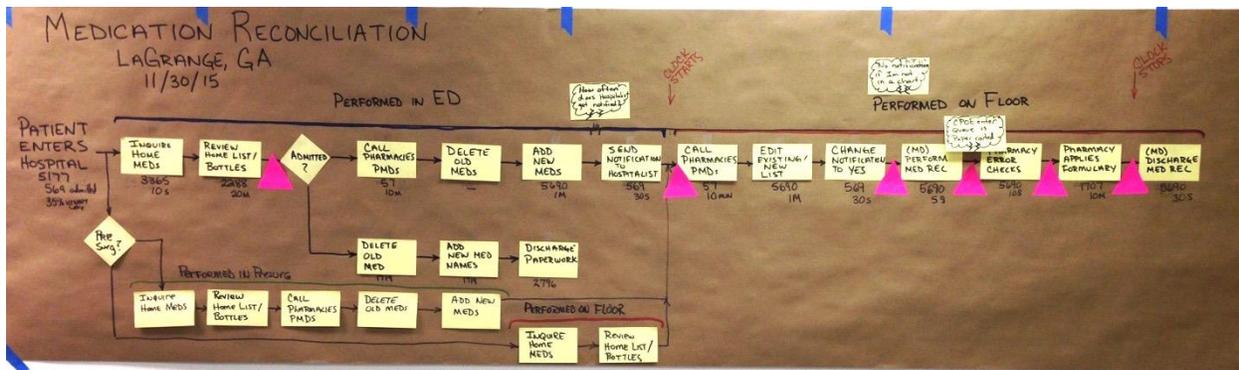
agenda. Once the information began to surface, the ED elected to remain a part of the team to see the solution through.

Prior to the week-long event the team walked the process and gathered relevant IT screen shots, key metrics, employee feedback, and a basic “process” understanding. The team discovered during this time that there was inconsistency in the way Medication Reconciliation was measured. This led to the following improved Operational Definitions:

Medication Reconciliation Complete	This means that the medication list is current with medicine name, dosage, frequency, route and last dose taken for each medication listed.
Baseline Medication List Complete	This means that the medication list is current with regards to medicine name only.

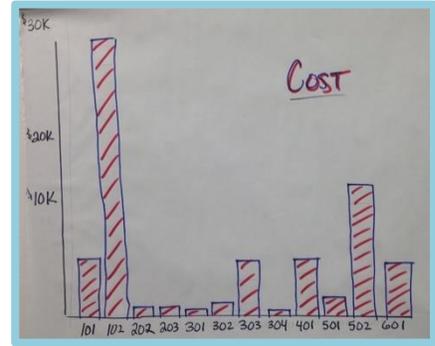
Mapping to See

The team started the analysis by process mapping what actually happens in the areas. This became the ongoing reference to assist in understanding how each of the steps could impact the others. The team populated the steps of the process with approximate labor cost, time and quality. This was performed to get an overall feel for where their nurses spent time addressing the medication reconciliation.



The team used this process to discover areas where there was high volume, delays, duplicate work, and steps lacking standard work. Through this discussion several storm clouds were identified and placed on the map for further investigation.

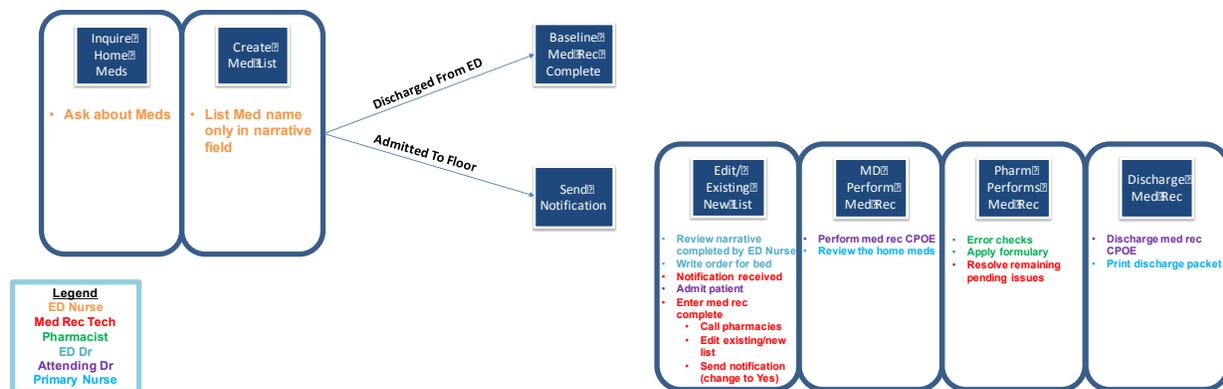
Once the areas of high volume and touch time were understood an approximate cost could be assigned to show the magnitude of the work required by individuals performing this activity. This analysis allowed the team to see the impact each step has on the process. By recognizing that the bulk of the impact is being felt in the ED not the floor allowed WGH to better understand where ultimate solutions needed to be addressed.



The team then focused on brainstorming ideas to address the discovered areas. Each solution was categorized by the step it impacted and then weighted according to an Ease vs. Impact chart.

The team was then split into teams with each team responsible for creating concepts that would solve the issues. The concepts were made up of the above ideas. The concepts were then scored versus patient criteria to determine the best solutions for implementation.

The final solution addressed both the ED and Floors and is reflected in the following flow:



The above solution was then piloted using the Pharmacist in the role of the Med Rec Tech to assure that the process was robust. The pilot concluded successfully and the Director of Pharmacy moved forward with the hiring process. Based on volume it was determined that the ED would perform the above activities 24/7 while the Med Rec Tech would only need to be staffed from 11AM to 11PM. The following issues were uncovered and mitigating actions were assigned:

1. Need a mobile computer station (computer in rooms are being used)
2. Interruptions on floor during Med Rec by admission process.
3. Unsure if admitting doctors are getting the notification that Med Rec has been performed.

There was one minor hurdle that happened after the pilot. Existing Pharmacy Techs desired the newly created positions. While this created a more experienced staff for the new process it also created a void in the current pharmacy roles.

Once the new Med Rec Techs are on boarded the following benefits are expected from this new process flow:

- More complete Med Rec list
- Decreases work load by being more efficient
- Speeds the time patients are required to spend in the ED
- CPOE speeds discharge on inpatients
- Less potential for medication errors
- Better PSO visibility via All scripts