Discharge Process Improvement
A Case Study by Barnes-Jewish Hospital of St. Louis

Discharging a patient is an activity common to every hospital - small, large, community, inner-city, teaching or non-teaching. The discharge process can have an impact on numerous factors, such as patient satisfaction, bed availability, timely tests and procedures needed for discharge, home health equipment and service availability, social worker and therapist coordination, transportation, and nursing home arrangements. No matter what type of patient is being discharged (maternity, medicine, orthopedic, neurologic) numerous activities must be completed for each before the patient can be released. This work toward discharge day should begin upon admission.

As part of a Lean/Six Sigma transformation journey at Barnes-Jewish Hospital, the discharge process is one many process improvement projects. Barnes-Jewish Hospital is a large urban teaching hospital in St. Louis, Missouri. (9,385 employees, 1,707 physicians, 914 residents/interns/fellows, 1,106 staffed beds, and 52, 605 admissions in 2006) Over the past year, Barnes-Jewish Hospital has worked to combine the power of Six Sigma and Lean principles and tools to reduce defects and process variability, and improve the efficiency and quality of key care delivery and support processes. The combination of these tools, first used in the manufacturing industry, is now being applied to health care and the effects are being felt throughout the organization.

In 2007, Management Engineers at Barnes-Jewish Hospital conducted more than 60 “events” in key areas involving more than 850 employees. These events have included Value Stream Analyses (VSAs) where multidisciplinary teams examine current processes, define an ideal state, and identify performance improvement opportunities. The VSA deliverable is for the team to identify Rapid Improvement Events (RIEs) that need to be completed for the VSA to achieve a desired Future State that will improve processes. An RIE is an intensive 4-5 day event where a multidisciplinary team designs, tests, and implements desired changes, including mechanisms to ensure that improvements are sustained. This article will discuss results from RIEs that were conducted to improve the discharge process from two different Value Streams: women and infants (post partum maternity care) and inpatient medicine divisions.

Physicians, nursing, ancillary services staff, and administration have joined to improve the discharge process. These discharge improvement projects have been implemented in two very different areas of the hospital: a post partum maternity ward (60 bed capacity), and 13 different inpatient medicine divisions (average 20-25 bed capacity on each division). Although the specific activities involved in patient discharge are very different across these divisions, the overall concepts of the process improvement effort are similar. This article will focus on the common techniques that need to be accomplished in order to efficiently discharge a patient.

The first discharge improvement project occurred on the post partum maternity floor. Before the RIE, none of the patients were discharged prior to 1:00 p.m. The most unique characteristic of a patient on the maternity floor is that they are admitted as one patient
but discharge involves a second patient, the baby. Since the length of stay is typically easy to identify based on time of admission, the challenge in this type of discharge is to complete all the activities for mother and baby in a timely manner. The focus of this project was to understand the barriers to performing circumcisions, baby photos, car seats and transportation before the patient needed to go home. Physician partnering was essential to identify changes in practice that were needed to achieve success. For example the physicians agreed to prioritize their rounding sequence to see the babies that should be discharged that day first and write the order for discharge. Transportation was another barrier to discharge. Solutions included a combination of patient/family awareness of discharge time and transportation assistance. The process changes resulted in an improvement from 0% to over 90% of the patients being discharged by 1:00 pm.

Figure 1. Average Time of Patient Discharge for Women and Infant Division

The transportation issue was also a barrier experienced on the medicine divisions. Before the discharge RIE on the medicine divisions, 50 percent of the discharges occurred after 4 p.m. The RIE team for the medicine divisions also established a discharge time goal of 1 p.m. The challenge with discharging patients from medicine floors is the variability in length of stay and the variation in patient’s needs. Communication between physician and the entire care giver staff (nurses, therapists, social work, case managers, etc) is critical from the instant a patient is admitted until the time of discharge.

A common feature of both projects is a “Discharge Board” to track progress and status of activities required for every patient. (Figure 2) It is a visual board with all patient’s names and room numbers in the first column on the left, tests, procedures, and activities that are required before discharge are listed in columns across the top. Magnets are used to indicate the status of the activities. For example, if a patient must see a respiratory
therapist, the nurse will place a red magnet indicating that the activity has been requested. When the activity is completed, the therapist will replace the red magnet with a green magnet. A blue magnet means that the procedure does not apply to that patient. The types of procedures listed in the column will obviously differ from maternity to medicine. Even among the different medicine divisions, the list of procedures must be customized according to patient needs. Patient safety issues such as flu and pneumonia vaccines should also be included in columns of the discharge board.

Figure 2. Elizabeth Heidt, lead charge nurse, illustrates the use of Discharge Board on a Medicine Division

Several iterations of the board were trialed before the divisions were satisfied with a prototype. The first generation of the board was in paper with markers so everything could be easily changed and rearranged (Figure 3). Touch screen monitor technology is being investigated for future generations of the discharge board.
Physicians were asked to write orders that said “anticipate discharge tomorrow” and “discharge home today” - Ancillary services also were included in communication, so tests and procedures could be prioritized and performed to prepare for day of discharge.

To successfully implement the discharge process improvements, the following four components are needed:

1. Communication: This is probably the most critical component and the most difficult for large divisions with numerous care givers throughout the patient’s hospital stay. The specific method of communication must be customized according to the culture and situation of the division. One division accomplished communication with physician, nurse and case managers conducting daily rounds in patient rooms. Another division with more geographic location challenges used posters and letters to communicate plans for discharging patients. Separate communication strategies must be established for physicians, patients and family members, care giver staff and ancillary departments. Once the discharge time has been established, this expectation must be communicated to everyone including the patient’s family. A poster was placed in each patient’s room to announce the time of discharge expected on the day they will leave.

2. Physician Discharge Orders: Physicians are expected to write an order with “intent to discharge next day”. If the discharge approval is contingent on any
condition, this is also included in the order. Then on day of discharge, the order should be written at least two hours before the established discharge time.

3. Discharge Board: Categories for patient procedures and tests must be customized according to the requirements of each division. A discharge board is a visual tool that is most successful if it is located in a high traffic area that is convenient for numerous care givers. Ideally each care giver that completes a required activity will update the board to communicate the status of that requirement. The board must be flexible and easy to change. For example if a procedure is not required for a specific patient a blue magnet is placed in the blank so everyone knows it is not needed at this time for this specific patient.

4. Data Collection, Entry into Database, Analysis: There must be a method to track success of the new discharge process. Time of discharge for the patients must be recorded. (see data entry screen from access data base in Figure 4) If a patient is discharged after the established target time, the reason for delay must also be tracked. (see pareto diagram in Figure 5) Weekly or monthly trends must be evaluated so solutions can be developed to resolve the most common delays and prevent them from happening again.

![Figure 4. Data Entry Screen from Access Database for Medicine Divisions.](image-url)
Figure 5. Pareto Graph Showing Reasons for Delay of Discharge.

Additional considerations when applying these discharge components in a new area:
1. What components are required for success in your area?
2. What are the techniques for communication that will work best for your staff?
3. What is the best way to communicate your needs to the physicians?
4. What is the best way to communicate your needs to the patients and families?
5. Would it help to develop a charter for the discharge project?
6. Is a Rapid Improvement Event needed to begin this new process in your area?
7. Are culture and barriers issues so unique that a six sigma project is needed to develop in-depth solutions?

Once components of the discharge process are in place, ongoing effort is still required. It takes cooperation of all care givers, patients, and family members to achieve a successful discharge process. Reasons for discharge delays must be constantly reviewed so appropriate solutions can be found. Each month can reveal unique issues. For example on one medicine division in February, 10% of the patients were unable to get transportation due to winter weather.
Figure 5. Percent of Patients Discharged by 1 p.m. on a Medicine Division.

Trends in delays must be continually reviewed and resolved. Ongoing cooperation and support of all caregivers, patients, and family members are critical for successful discharge. As this team works together they can achieve the most efficient and safe patient care environment.

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If your organization is interested in submitting a case study in a future SHS newsletter, please contact chapters@iienet.org.