

# Discharge When Medically Ready

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## ABSTRACT

**Quality Problem:** The timing and pace of patient discharges are not level-loaded throughout the day at many institutions including ours, an academic medical center and adult Level I trauma center located in Milwaukee, Wisconsin.

**Initial Assessment:** Only 4% of patients were being discharged with rooms marked dirty by 11 AM at our institution.

**Choice of Solution:** We put together a multidisciplinary team of approximately 30 stakeholders to develop a revised process that focused on coordination of discharge activities, plan of care awareness among team members, and communication with patients and families.

**Implementation:** The discharge process was piloted and iteratively adjusted on a single medicine floor.

**Evaluation:** Our interventions made a noticeable impact on median room “ready to be cleaned” (RTBC) time without having an adverse impact on length of stay. RTBC improved by a median of 39 minutes ( $P=0.019$ ), and the proportion of rooms ready to be cleaned by 11 AM increased from 4.19% to 8.13%.

**Lessons Learned:** Having a multidisciplinary team participate in the evaluation and development of a new process was critical. Additionally, implementing solutions on a single unit allowed for rapid iteration of changes.

## QUALITY PROBLEM

Acute care hospitals are experiencing increased inpatient census with a need for early bed availability during the morning hours to accommodate incoming patient flow.<sup>1</sup> Prioritizing discharges in the morning can be challenging given elements of patient care that need to be addressed on the morning of discharge. When census begins to rise, patients begin to board in the emergency department (ED) and length of stay begins to increase, discharge distribution concentrates later in the day, and demand for inpatient space advances to earlier in the morning due to daily admissions outnumbering discharges.<sup>2</sup> The aim of this project was to develop a process that focused on early discharge for patients who are medically ready by applying process improvement principles.

Studies attempting to reduce total length of stay and streamline the discharge process have made interventions at multiple levels, including early discharge orders by physicians, twice a day multidisciplinary rounds, early transportation to nursing facilities, and creating websites to track daily discharges before noon.<sup>3-5</sup> Many institutions have examined the importance of multidisciplinary teams as a modality to create clinical microsystems to improve communication and patient outcomes and allow for optimized discharge planning.<sup>6-8</sup> While there is guidance on optimizing patient transitions from the inpatient to outpatient settings,<sup>9</sup> there is a paucity of data on a comprehensive set of tactics to facilitate early discharges.

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## INITIAL ASSESSMENT

Similar to other academic medical centers,<sup>10</sup> the timing and pace of patient discharges are not level-loaded throughout the day within the inpatient platform in our institution, an academic medical center and adult Level I trauma center located in Milwaukee, Wisconsin.

A critical mass of discharges happens in the afternoon, with nearly 50% occurring between 1 PM and 5 PM. This creates an insufficient number of available beds for timely placement of patient admissions, with 50% of admissions occurring between 11 AM and 7 PM.

## CHOICE OF SOLUTION

We employed Institute of Healthcare Improvement's Model For Improvement (MFI). MFI frames an improvement project with 3 questions:<sup>11</sup> (1) What are we trying to accomplish? (2) How will we know a change is an improvement? (3) What changes can we make that will result in improvement?

Our goal with this project was to open up inpatient beds earlier in the day. We decided to track our median bed "ready to be cleaned" (RTBC) time and the proportion of beds marked ready for cleaning by 11 AM as indicators of improvement in the number of inpatient beds available for new admissions. A 30-member team from medical and surgical floors was assembled to determine the changes needed to reach our goal. It included representatives from various disciplines: attending and resident physicians, advanced practice providers, nursing, pharmacy, respiratory therapy, radiology, physical therapy, occupational therapy, speech therapy, patient flow, and transport. This team met 1 to 2 times per month over the span of 7 months and was facilitated by the institution's process improvement department.

The team first developed a current state process map that represented the discharge planning process steps, from admission until discharge. The team then utilized Lean principles to analyze the process map and identify non-value-added activities within the current process. Lean originated in the business world as a cost reduction mechanism employed by all members of the organization to systematically reduce waste.<sup>12</sup> Lean principles are routinely used in health care to maximize value by reducing waste and wait.<sup>13</sup> The root causes for the non-value-added activities in our discharge planning process were identified and solutions were developed to address them. Root causes were grouped into 19 categories, each of which was further divided into subcategories. A total of 91 solutions were identified and eventually solidified into 53 discrete action items, with several items targeting each root cause. These solutions were prioritized by using scores assigned by the team for "impact to project goals" and "effort to implement." These scores were used for pilot implementation priority to maximize impact and ensure stewardship of resources. The 19 categories and subcategories of barriers identified and solutions with highest score in each subcategory are presented in the Table.

These solutions led to the development of multiple interventions throughout the patient's stay (Table and Appendix). Some solutions were not implemented during the pilot, mostly due to informational technology or budgetary constraints (Table). We decided to move forward with pilot while continuing to work with project sponsors on implementing these solutions at a later date. Key behavioral items implemented during the pilot are summarized below.

On the day of admission, the clinician and nurse discussed the goals of care with the patient, and the clinician established the anticipated date of discharge, if known.

At T-48 (48 hours prior to discharge), the clinician assessed the patient's progress to the discharge milestones. The anticipated discharge date was established or updated. Nursing staff assessed the patient's and family's understanding of the care plan and discharge needs.

At T-24 (24 hours prior to discharge), the clinician assessed the patient's progress to the discharge milestones. Remaining activities were ordered and/or completed, including imaging/procedures, medication reconciliation, home oxygen evaluation, therapy, consults, and discharge teaching. Additionally, durable medical equipment, home care, and transportation were arranged.

On the day of discharge, the clinician reviewed the planned discharge, final discharge medication list, and after-visit summary. The care team completed remaining items for patient discharge, including providing final education, prescriptions, and durable medical equipment.

## PILOT IMPLEMENTATION

The solutions were planned for pilot on a single medicine unit for 2 months. The education methods used for the new process were department meetings, leader emails to staff, the hospital intranet, and an internal podcast. Posters summarizing the changes were posted on the pilot unit and in staff workrooms.

After completion of education, we conducted the pilot. Compliance with various elements of the pilot was determined by nurse manager audits. This involved the nurse manager rounding with patients throughout their stay to determine what aspects of the care plan had been discussed with them and also auditing patient's whiteboards for the presence of a care plan and estimated discharge date. This information, along with observations by members of the care team related to the pilot, was reviewed at weekly multidisciplinary meetings and adjustments were made. The main points of adjustment during pilot implementation included members of the multidisciplinary team gathering information from their respective frontline staff regarding compliance with tactics, increasing awareness of among staff members by sharing tactics at staff meetings on an ongoing basis, and coaching staff members through one-on-one interactions with unit leaders.

**Table. Barriers and Solutions to Discharge When Medically Ready**

Category	Subcategory	Highest-Ranked Solutions in Each Subcategory <sup>a</sup> (Score out of 100)
Imaging studies	Scheduling outpatient exams Update SPOK <sup>b</sup> provider list	<i>Exams that do not change the disposition of the patient should be scheduled as outpatient (65)</i> <i>Add intern/resident to SPOK<sup>b</sup> paging list to make it easier to determine who to page (41)</i>
EPIC (EHR)	Imaging preparation Home care/DME orders Home oxygen orders  Discharge checklist Discharge order alert Physical therapy/occupational therapy Swallow evaluation Security-personal property	Have all imaging preparations be on EPIC for nurses (62) <i>Link templates of needed information to home care/DME orders in Epic (47)</i> <i>Information services to work with home care medical to create a comprehensive template for home oxygen ordering (45)</i> <i>Transition to standardized needs flowsheet (discharge check off) that all disciplines can see (42)</i> EPIC alert to flag patients 24 (T-24) and 48 (T-48) hours prior to discharge and day of discharge (40) When team places a consult, there should be a prompt in EPIC to ensure activity order is in place (50) Create an order set to include bedside swallow evaluation and video swallow if indicated (46) Alert on DC navigator of possession of personal property by security (41)
Clinician	Clinician plan of care updates to the team After-visit summary Order entry Controlled substances Attending to see patient Team rounds House staff	<i>Clinicians enter anticipated discharge date and discharge plan in their daily progress note and attend care coordination rounds (64)</i> <i>Clinicians to enter discharge instructions on day of discharge (52)</i> <i>Provide WOW (Workstation On Wheels) to providers (61)</i> <i>Educate clinicians to "sign" controlled substances in Epic instead of "sign and hold" (45)</i> <i>Attending on house-staff team to see ready for discharge patients prior to rounds (41)</i> <i>House-staff teams, when not post call, to start rounds by 8.30 AM (51)</i> <i>Better education for house staff on discharge process (33)</i>
Pharmacy	Priority lane Test script Fill preference Antibiotic script Printed scripts Additional staff Fill alert Discharge medication reconciliation	<i>Have a fast-track process in pharmacy to fill medications faster for discharged patients (50)</i> <i>Create policy giving pharmacist the ability to run test prescriptions under attending's name (54)</i> <i>Pharmacist to ask about where to get prescription filled after DC (51)</i> Policy allowing pharmacist to print antibiotic script once Infectious Disease note is in (43) <i>Have prescriptions completed and given to pharmacy as soon as possible (43)</i> Hire additional staff to complete test prescriptions/prior authorizations (27) Patient to receive text message when prescription is ready for pick up at pharmacy (35) Create a process to keep discharge medication report separate from other AVS documents (47)
Physical therapy	Admission assessment Additional staff	<i>Nursing to screen for need for PT/OT assessment using Activity Measure for Post-Acute Care( 34)</i> Increase physical therapy/occupational therapy daily staffing (30)
CCRs	Clinical milestone focus	<i>Transition CCRs to being clinical milestone-focused from date-focused (45)</i>
Education	Managing patient expectations Wound/ostomy teaching White boards	<i>Create scripting to educate patients and families in discharge process throughout admission (39)</i> Create standardized videos for wound/ostomy care (41) <i>Utilize white boards in patient rooms to improve communication with patients/families (51)</i>
Follow-up	Follow-up appointments Identification of PCP	Priority line to clinic scheduler to set up post discharge appointments (41) Nursing to flag patients without PCP at admission assessment and communicate with health care unit coordinators on floors to set up PCP (40)
Case management/ social work	Ride home Difficult discharge team  DME supplier	Arrange Uber/Lyft prepaid cards for payment to patients for ride home (31) <i>Create team to discharges where patient has been medically ready for more than 24 hours but there is no safe discharge plan (30)</i> <i>Provide feedback and assign consequences to DME supplier for delays (21)</i>
Dietary	Home nutrition support	<i>Determine need for home nutrition support on post-operative day 1 and determine insurance coverage greater than 24 hours prior to discharge (37)</i>
Transport	Staffing model	<i>Transport to provide adequate staffing during peak hours and support 15-minute maximum wait time (36)</i>
ICU	Early discharge planning	<i>Initial discharge assessment and planning to begin in the ICU (51)</i>
Consults	Timely communication  Diabetes education Diabetes education consults	<i>If day of discharge consult cannot be avoided, inform consulting team when calling consult and consulting team to prioritize (43)</i> Diabetes education to schedule time for education with patient's family (41) Empower RNs to place diabetes education consult (44)
Nursing	Additional staff Rounding with primary team Plan of care	<i>Expand hours of patient free charge nurse to round with teams and coordinate discharge needs (35)</i> <i>Include RN in bedside rounds with primary team (53)</i> <i>Charge RN to page clinician to clarify discharge plan in the afternoon if unclear (44)</i>

Abbreviations: EHR, electronic health record; DME, durable medical equipment; PT, physical therapy; OT, occupational therapy; CCR, care coordination rounds; PCP, primary care provider; ICU, intensive care unit/ RN, registered nurse.

Italicized Items were implemented during the pilot.

<sup>a</sup>Score out of 100, calculated as (Anticipated impact X (10-anticipated effort)); anticipated impact and anticipated effort both scored on a scale of 1 to 10 with 10 being maximum impact/effort.

<sup>b</sup>SPOK is the clinical communications system used at our institution.

## EVALUATION

We assessed performance of the process by evaluating the percentage of beds marked RTBC by 11 AM and median RTBC time. A previous study showed an association between increase in the proportion of patients discharged before noon and length of stay, presumably driven by the perverse incentive of keeping the patient an additional midnight and discharging them early the next day.<sup>14</sup> Therefore, we also monitored length of stay as a balancing measure to ensure it was not adversely influenced by the efforts to improve the RTBC metrics.

The pilot unit metric performance was evaluated by utilizing data from 2 months of patient discharges preintervention (N = 167) and 2 months postintervention (N = 160). There was a statistically significant ( $P = 0.017$ , Mann-Whitney test) favorable shift in the median RTBC time of 39 minutes earlier in the day from 15:32 to 14:53. There was no significant change in median length of stay ( $P = 0.444$ ) from 3.33 to 3.42 days, which was consistent with the project's deliverable expectations. Length of stay was calculated based on the number of midnights a patient spent in the hospital. While we saw a slight increase of 0.09 days in the length of stay, we do not think the change was clinically meaningful. The data indicated a favorable 94% improvement (from 4.19% to 8.13%) for rooms RTBC by 11 AM; however, analysis did not indicate statistical significance ( $P = 0.168$ ). Finally, there was no significant change in the 30-day readmission rate (17.2% to 16.9%,  $P = 0.13$ ).

Based on these results, the interventions made a noticeable impact on early discharge planning without having an adverse impact on length of stay. In a study done at a pediatric hospital, a 79% increase in discharges by 11 AM (8.8% to 15.8%) reduced wait times in the ED from 221 minutes to 133 minutes.<sup>15</sup> While we did not study the change in our ED wait times with the improvement in proportion of rooms marked RTBC by 11 AM, we anticipate a similarly positive impact.<sup>10</sup> Reduction in ED overcrowding has the potential to improve patient and staff satisfaction<sup>16</sup> and improve patient safety.<sup>17</sup>

## LESSONS LEARNED

The team reported the value in bringing various roles together during process development to aid in understanding tasks and challenges faced by other members of the care team. Many new insights were unexpected and allowed understanding beyond what was understood within the context of busy day-to-day observation. Additionally, piloting solutions on a single unit allowed for rapid iteration of changes, since the number of stakeholders to involve in assessment of performance and implementation of incremental changes was minimized. Another key learning is the need for formal electronic health record-generated reports on compliance with tactics included in the pilot.

The next step is to implement this process on all hospital units, while utilizing successive “plan-do-study-act” cycles. Solutions

that were not implemented during the pilot will be incorporated in the next phase as they become available.

Two additional interventions are being considered based on learnings from the pilot. Lack of team awareness of readiness for discharge is a key barrier to early discharges. We addressed this by asking clinicians to enter expected discharge date on whiteboards in patient rooms and filling out the expected discharge date in the electronic health record during our multidisciplinary care coordination rounds. Based on input from unit nurse managers, we are considering highlighting readiness for next day discharge on a whiteboard placed in multidisciplinary work areas on the floor.<sup>15</sup> In addition, our clinicians reported a need for an after-noon huddle with social work and case management to prepare patients for early discharges the following day.<sup>3</sup> We plan to discuss the logistics of this change with our care management colleagues and hospital administration.

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**Appendix:** Available online at [www.wmjonline.org](http://www.wmjonline.org).

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