Appendix

Promoting Early Mobility and Reducing Length of Stay in Hospitalized General Medicine Patients: A Quality Improvement Project

**Quality Improvement Process:**

The structured QI model included the following components: (1) framing the problem within the larger healthcare system and creating a multidisciplinary improvement team, (2) identifying barriers to change and appropriate solutions, (3) selecting performance measures, and (4) ensuring all patients receive the intervention through a “4 Es” approach: engage, educate, execute, and evaluate. 1,2 During the Planning Phase twice-monthly meetings were conducted with multidisciplinary team members, including a physical medicine and rehabilitation physician (EHH), the director of rehabilitation therapy services (MF), a supervisor for inpatient rehabilitation therapy services (AL), a rehabilitation therapy team coordinator, a general medicine physician champion (DJB), directors of nursing for general medicine (JI, KD), nursing education coordinator (RH), unit-based nurse managers (KWK, SPB) and nurse champions (JS, RLC).

Barriers to mobilizing patients were identified during multidisciplinary meetings and a formal survey of nurses and rehabilitation therapists, as previously reported. 3 This process demonstrated, for instance, that the units did not have enough patient chairs or appropriate call-bell equipment. This prompted the QI team to work with hospital administration to acquire the appropriate equipment so that patients could be safely mobilized to chairs.

In next component of the structured QI model, we evaluated performance measures. The measures need to fulfill three goals: (1) record the actual mobility of a hospitalized patient, (2) set individual patient mobility goals (e.g. move up 1 step on the scale tomorrow), and (3) standardize the description of patient mobility across all hospital staff. Hence, the multidisciplinary team created the Johns Hopkins Highest Level of Mobility (JH-HLM) scale, which was adapted from a scale that is used in the medical intensive care unit at Johns Hopkins Hospital and was demonstrated as feasible and reliable for use by nurses and physical therapists as part of routine clinical practice.4 The JH-HLM scale (Figure 1, Appendix) is ordinal, ranging from bed rest (score=1) to ambulating ≥250 feet (score=8). The ambulation distances used in the JH-HLM scale (25 feet, and 250 feet) represent milestones commonly cited in existing literature. For instance, 25 feet represents the distance in the “Stand and Walk” and “Timed 25-Foot Walk” tests and approximates the ‘Get up and Go’ test distance,5,6 and 250 feet represents a functional household ambulation distance, is 4 metabolic equivalents (a common goal in cardiac rehabilitation programs), and represents the average distance that a healthy elderly person can ambulate in the 2-Minute Walk Test.7-9 Staff workload was also considered in designing the scale, such that mobilizing a patient to the highest value (JH-HLM =8) did not represent a significant time burden, but was still beneficial to the patient and provided a useful marker for discharge planning purposes. The scale was pilot tested by 2 nurses and 2 physical therapists to ensure clarity, face validity, and ease of use. The QI team worked with hospital informatics to integrate the JH-HLM into the existing electronic medical record (EMR) to facilitate daily documentation by nurses as part of routine care. In addition, the QI team worked with hospital administrators to pass a hospital-wide policy for functional assessment, which incorporated the JH-HLM scale into standard nursing documentation workflows by the end of the project.

As part of the 4 E’s process for executing the QI project, stakeholders were “engaged” via nurse managers and nurse champions discussing the harms of bed rest and the project’s objectives during staff meetings, posting educational materials on bulletin boards, and involving an ICU nurse champion, who worked on a preexisting ICU-based early mobility project,10 to discuss her experiences with unit staff.

The next step of the 4 E’s process was “education.” Education was provided to the nurses and support staff in a number of ways. First, six educational sessions were held for nurses to address the following issues: the importance of mobilizing patients, details of the project, and instructions on documenting the JH-HLM scale in the electronic medical record with case examples. Second, laminated cards with relative contraindications to mobilizing patients were provided to staff and taped to unit-based computers. The information for these cards was adopted from a previous publication11 and refined with input from physician champions (DJB, SD). Third, all staff completed a 15-minute online learning module regarding the importance of mobilizing patients with case examples on documenting the JH-HLM scale to complement the in-person educational sessions. Fourth, hands-on training sessions were provided to nurses by a physical therapist regarding how to safely mobilize a patient from bed to chair and safety strategies when ambulating a patient.

The “execution” step of the project involved three major components on a daily basis, 5 days per week. First, daily morning huddles with all nursing staff working in the unit that day and a physical or occupational therapist were completed. The goal of these brief 10-minute huddles was to discuss the “ABCs” for each patient on the unit. The ABCs acronym served to represent the following issues: (A) Activity level performed by the patient on the prior day, (B) Barriers to mobilizing the patient today, and (C) Continue to progress the patient with setting a new higher mobility goal, based on the JH-HLM scale, for today. The rehabilitation therapists provided in-the-moment education or guidance to the nurses during the huddles, but were also available on the unit during most days to answer questions and problem-solve for mobilization issues. The huddle also served as an opportunity to discuss other relevant topics, such as how to measure a patient for a rolling walker or a cane, how to manage a patient who is fearful of falling, or use of in-chair resistance band exercises for patients. Second, a goal was set to mobilize patients three times daily, twice during the day shift and once during night shift. Nurses were instructed to document the mobility, at the time it occurred, using the JH-HLM. If the patient was mobilized more than once before documentation, nurses were instructed to record the highest level of mobility that the nurse observed since the last documentation. Third, discussion of JH-HLM scores occurred during daily unit-based care-coordination meetings of the nurses, physicians and social-workers in order to address barriers to mobilizing patients, such as optimizing pain control, facilitate discharge location planning, and expedite physician consultation with physical and occupational therapy for appropriate patients. As a result of the evaluation process (below), the nurses and rehabilitation therapists proposed that the daily huddles be gradually replaced by discussion of the ABCs during care-coordination rounds, where the rehabilitation therapists were also present. Fourth, unit-based meetings occurred twice monthly, where project champions met with nurse managers and nurse champions as well as conducting “walk rounds” to meet with individual nurses on the unit to discuss their experience with incorporating patient mobility and documentation into their workflow and any specific concerns or challenges they had on the unit. Fifth, meetings occurred every 2 months with the nurse managers, nurse champions, QI project leads (EHH, MF, and AL), and physician champions (DJB). The purpose of the meetings were to discuss specific challenges on the units and data on nursing JH-HLM documentation compliance, and the actual JH-HLM scores (provided through automated data extracts from the electronic medical record). Reports on documentation compliance and JH-HLM scores were available starting 4 months after start of the QI project and were generated by the project lead (EH).

The final “evaluation” stage of the 4 E’s model consisted of four activities. First, rehabilitation team-leaders observed daily huddles to provide feedback to the individual rehabilitation therapists on strategies to facilitate discussion of the ABCs. Second, reports on project data were provided back to nurse managers, unit-based QI champions, and unit staff every 2 months and started on the 4th month of the project. Third, 7 months after project execution started, educational sessions were repeated to all staff and feedback was provided based on collected data, such as documentation compliance and patient mobility levels, and nurse champions presented the project during an American Nurses Credentialing Center (ANCC) Magnet recognition program visit during. Lastly, results of the project were shared with hospital administration that helped create a nursing policy of functional assessment, as described above.

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**Figure1: Johns Hopkins Highest Level of Mobility (JH-HLM) Scale**

<Fig 1>

*\*Bed activity includes passive or active range of motion, movement of arms or legs, and bed exercises (e.g., resistive bands, cycle ergometry, dependent transfers)*

JH-HLM scale was developed to record the mobility that a hospitalized patient *actually* does, not what he or she is capable of doing. Nurses were requested to document mobility three times daily, based on direct observation of the highest level of mobility the patient performed since the last documentation. The main goals of the scale were to (1) record the actual mobility of a hospitalized patient, (2) set individual patient mobility goals (e.g. move up 1 step on the scale tomorrow), and (3) standardize the description of patient mobility across all hospital staff