Perceived Barriers to Early Mobility Efforts Amongst Intensive Care Nurses

Amanda M. Golaszewski

Rutgers School of Nursing

DNP Chair: Helen Miley, RN, PhD, CCRN, AG-ACNP

DNP Team Member: Albert Heuer, PhD, RRT, RPFT, FAARC

Table of Contents

Abstract

Early mobility initiatives are documented throughout the literature as a way to improve patients' physiological and functional status both during an intensive care admission as well as after discharge from an acute care setting. This project examined whether targeted re-education on early mobility and review of the project site's existing early mobility protocol improved the knowledge, attitudes and behaviors of the bedside critical care nurse. A review of literature was conducted using the Rutgers University Health Sciences online library, specifically EBSCO host, CINAHL, Clinical Key, Web of Science, and PubMed. This project took place in a 10-bed medical ICU and 22-bed surgical ICU in northern New Jersey. Intensive care bedside nurses were given a modified version of Hoyer, et al. (2015) perceived barriers to early mobility survey tool before and after a brief education session. A total of 54 nurses were needed and 32 agreed to participate (n=32), resulting in a 59% response rate. Demographic information included the nurses' primary unit as well as years of critical care nursing experience. Questions were grouped into the subcategories of knowledge, attitudes and behaviors. Wilcoxon signed rank tests were used to compare the medians of each answer grouping and found a statistically significant change in attitudes (p=0.022) between groups when all results were considered. Sub-analysis did not yield statistically significant results, although positive change was noted in all groups except MICU. This corresponds to the KAB framework which states that changes in attitude result from knowledge, and ultimately behavior change occurs over time.

***Keywords*:** early mobility, progressive mobility, intensive care unit, knowledge, attitudes, behaviors, perceived barriers to mobility

Perceived Barriers to Early Mobility Efforts in Intensive Care

Early mobility (EM) protocols have consistently shown across the literature to benefit patient outcomes, however utilizing these protocols to their fullest potential proves difficult due to both actual and perceived barriers, in addition to the immense resources needed to maintain such initiatives. Gaining a better understanding of the barriers to EM frontline staff perceive could provide insight into why these protocols fail to reach full compliance.

Background and Significance

Reasons that evidence-based therapies are not translated into clinical practice are multifactorial. According to Hoyer, Brotman, Chan & Needham (2015), barriers to EM fall under three domains – knowledge, attitudes, and behaviors. Understanding local barriers is important to quality improvement (QI), both in the original planning phase as well as the post-implementation phase as adjustments may be necessary to improve outcomes and overall feasibility of the initiative.

Across the literature, communication is viewed as a vital component to an EM initiative. Eakin, Ugbah, Arnautovic, Parker and Needham (2015) found that 90% of participants reported communication amongst interdisciplinary team members as helpful. Communication and scheduling between various team members is necessary because multiple disciplines are involved in caring for critically ill patients (Eakin, Ugbah, Arnautovic, Parker & Needham, 2015). In order for a mobility initiative to be successful, team members must be cohesive and practice open communication (Eakin, et al., 2015). Dammeyer, et al. (2013) found that lack of communication between team members lessened the chances for mobility and that “dialogue was imperative for safety, consistency of care, and real-time interdisciplinary education” (p. 113). In a randomized control trial, Schaller, et al. (2016) found that daily mobility goal assignment and

closed-loop communication across providers led to a shorter ICU and hospital length of stay and a higher odds-ratio of achieving functional independence at hospital discharge (1386).

Johnson, Petti, Olson & Custer (2017) found a significant increase in post-test responses after targeted mobility education sessions, specifically in the areas of knowledge, attitudes and behaviors towards EM, supporting the idea that understanding perceived barriers can improve practice and outcomes. Hassan, Rajamani & Fitzsimons (2017) noted a significant increase in nursing confidence with mobilizing orally intubated patients after incorporating a competency program. Messer, Comer & Forst (2015) found the education on mobilization was effective and increased nursing knowledge on the benefits of EM. In addition, post-test scores were significantly higher than pre-test scores and overall mobilization and dangling improved after education (Messer, Comer & Forst, 2015).

Prolonged bedrest negatively affects nearly every organ system. Patients may experience orthostatic intolerance as there is less stimulation to baroreceptors. Orthostatic hypotension may take weeks to resolve after baroreceptor deconditioning, especially in the elderly population. These unpleasant symptoms may place a patient at greater risk for less activity, thus leading to further baroreceptor deconditioning and falls (Winkelman, 2009). Within the vasculature, prolonged bedrest initiates what is known as Virchow's Triad – vascular stasis, intravascular injury, and hypercoagulability – placing patients at increased risk for venous thromboembolic (VTE) events, including deep venous thrombosis and pulmonary embolism (Winkelman, 2009). Bedrest impairs blood flow, particularly arterial blood flow, and muscle atrophy contributes to venous pooling, resulting in vascular congestion and capillary injury. When patients are supine, they are experiencing increased vasoconstriction, which results in an increased systemic vascular

resistance, ultimately leading to more turbulence in the arterial system and activation of clotting factors, potentiating the risk for VTE events (Winkelman, 2009).

Red blood cell mass decreases after 14 days of bedrest. This can affect the RBC's oxygen carrying capacity, which may be a factor in post-discharge fatigue (Winkelman, 2009). Bedrest also increases calcium excretion, and the primary source of calcium is bone. As little as 10 minutes of resistance activity daily can interfere with bone degradation during 90 days of bed rest (Winkelman, 2009). Other renal effects from bedrest include proteinuria and calcinuria, both of which are associated with exacerbation of an acute kidney injury. Bed rest reduces blood volume, and within the first three days this lower blood volume reduces glomerular filtration, resulting in alterations in the renin-angiotensin-aldosterone mechanism which regulates sodium and body water (Winkelman, 2009).

Alterations in skin integrity occur from vascular congestion and dependent edema, resulting in compression of the soft tissue against a bony prominence. Inflammatory process that result in vasodilation, such as sepsis, can result in extravasation of cellular fluid in the interstitial space, further exacerbating edema (Winkelman, 2009). Skin is the body's largest organ, and breakdown can result not only in increased length of stay and healthcare costs, but also place patients at increased risk for infection.

Prolonged bed rest also leads to changes in cognition, sleep, and pain sensation. Patients in the ICU are bombarded with unfamiliar sensory input, disruptions in their circadian rhythms, restrictions in voluntary movement, all of which can affect the autonomic, peripheral, and central nervous systems. Body rhythm desynchronization occurs after 20 days of continuous bedrest. This is thought to occur from both the loss of upright posture and disruption of light-dark cycles (Winkelman, 2009). There is a considerable gap in the literature regarding sleep hygiene in the

ICU setting, as it is difficult to objectively study. What is known, however, is that sedation is not physiologically comparable to sleep (Weinhouse & Watson, 2011). Propofol mimics non-REM sleep, however it suppresses REM sleep and worsens the sleep quality of critically ill patients, whereas benzodiazepines and opioids both decrease both slow wave sleep, or stages three and four of non-REM sleep, and REM sleep (Drouot & Quentin, 2016; Kondili, Alexopoulou, Xirouchaki, Georgopoulos, 2012).

Muscle mass deteriorates because there is a decrease in protein synthesis and an increase in protein degradation. There is a measurable muscle mass loss within 3 to 5 days in both healthy and critically ill individuals who undergo bedrest (Winkelman, 2009). Older adults experience muscle loss considerably faster than young adults, and they have 10% to 20% less skeletal muscle mass, meaning they have fewer days of metabolic reserve at their body's disposal (Winkelman, 2009). Without frequent position changes, the vertebral discs are not massaged open, which can result in muscle spasm and back pain (Winkelman, 2009). Intensive care unit acquired weakness, or ICUAW, is a generalized muscle weakness that first develops during a critical care stay and often persists, for which no other cause can be determined, other than the illness and its associated treatment (Hermans & Van den Berghe, 2015). ICUAW typically affects the limbs and respiratory muscles, which may ultimately affect a patient's ability to be weaned successfully from mechanical ventilation. A systematic review by Appleton, Kinsella, and Quasim (2015) found the incidence of ICUAW in patients undergoing mechanical ventilation for greater than 7 days to be 40% with a 95% CI, however the range across the studies varied from 9% to 86%. Hermans et al. (2014) found that discharge destination was significantly different for those with weakness compared to those without and that weakness was associated with higher healthcare costs and increased 1-year mortality. Additionally, following

an acute care hospitalization, patients with a discharge diagnosis of ICUAW incur on average $57,220 more in hospital charges compared to those without ICUAW (Kelmenson et al., 2017).

Though immobility associated with ICU stays has many negative effects, early mobility initiatives have been demonstrated across the literature to be safe and effective in reducing both ICUAW and delirium. In a randomized controlled trial, Schweickert et al., (2009) found a return to independent functional status of 59% in the early mobility group, compared to 35% in the control group. Schweickert et al. (2009) also reported an ICU-delirium duration half as long in the intervention group with 2.4 more ventilator-free days and 43% of intervention patients were discharged home as compared to 24% of the control group. Early mobility initiatives are ways intensive care providers can become more involved in a patient's discharge planning and post-acute care quality of life, areas that are not necessarily the primary focus of a critical care clinician.

Needs Assessment

There are certain instances in critical care where bedrest cannot be avoided – unstable spinal fractures, patients receiving chemical paralytics to improve their respiratory status, patients active bleeding or myocardial infarction, and patients in status epilepticus undergoing burst suppression therapy, for example. This, however, is just a small subset of patients, and the literature has consistently shown that early mobility is safe and feasible in the critical care population.

The American Association for Critical-Care Nurses (AACN) uses the ABCDEF bundle, a multi-component bundle of evidence-based guidelines associated with improved physical function and reduced duration of mechanical ventilation in adults. This bundle includes:

- Awakening trials
- Breathing spontaneously
- Coordination of daily awakening and spontaneous breathing trials
- Delirium screening
- Exercise/early mobility

In a worldwide survey assessing use of, only one-third of respondents reported screening patients for ICUAW, and while prescribing rates were high (73% to 91%), only 31% of respondents reported having an interdisciplinary mobility team (Costa et al., 2017; Morandi et al., 2017). Most often, the team consisted of solely a physical therapist (31%); additional staff, such as a critical care nurse (17%) or a critical care nurse and a respiratory therapist (12%) were even less common worldwide (Morandi et al., 2017).

A 10-bed medical ICU and a 22-bed surgical ICU in northern New Jersey experienced such a decline in EM, momentum. Early EM initiatives involved both a physical therapist (PT) and a designated nursing assistant (NA), and staff was able to successfully mobilize both mechanically ventilated (MV) and non-mechanically ventilated patients. The majority of mobilized patients were those who were not mechanically ventilated, and the patients that were undergoing MV were mobilized with the assistance of a respiratory therapist (RT). However, after changes in allocation of resources resulted in the loss of the NA, efforts to mobilize patients undergoing MV have shifted from out of bed activities to active range of motion and raising the head of bed to 45-65 degrees, whereas those patients who are easier to mobilize now receive the bulk of PT services. In this demanding environment, physical therapy treatments are considered easy to defer, unlike, for example, a dialysis treatment which is considered integral to a patient's care.

An interdisciplinary team, including end-user RNs, RTs, and PTs, performed a strategic planning analysis to determine what *strengths, weaknesses, opportunities,* and *threats* (SWOT) must be overcome prior to initiating this proposed change. Strengths include a designated PT, who is occasionally able to enlist the help of a rehabilitation aide when staffing and workload allow, as the aides are used throughout the PT department and not specifically designated to the EM team. Additional strengths include access to specialized equipment, including ceiling lifts, an in-bed cycler with both active and passive functionality, and a stand-table, as well as an already existing early mobility protocol. Weaknesses include potential increased workload burden on both nursing and respiratory staff. Nursing is often tasked with caring for up to 3 patients, whereas respiratory therapists may be covering multiple units and may not always be available. Other weaknesses include a high number of newer staff members who were not present during the initial protocol rollout and who may have reservations regarding safely mobilizing more complex patients. Potential opportunities associated with this project include reducing ICU length of stay, ventilator days, and delirium days. Another opportunity may include transitioning mobility from physician-driven to PT and nurse driven. Additionally, the unit has the potential to benefit financially from those opportunities. Cost-savings may help leadership secure the data and therefore funding to justify additional staffing to support further implementation. Threats to the initiative include time constraints on staff as attending additional education sessions will be necessary.

Problem Statement

Despite the evidence demonstrating the importance of EM initiatives, full compliance remains an issue. Parry et al. (2017) determined that barriers to EM compliance can be broken down into six themes:

- clinician knowledge
- evidence for and application of rehabilitation
- patient factors
- safety concerns
- environmental factors
- culture and teamwork

These barriers represent clinician, patient, and healthcare system-related factors, each contributing both independently and conjunctively to the sustainability of a mobilization initiative. There is a considerable gap in the literature illustrating the sustainability of early mobility initiatives in critical care settings, as well as follow up data regarding whether ICUs are consistently able to adhere to EM protocols after the initial momentum of an initiative ends. A look at whether continued education influences staff's perceived barriers to mobility is warranted as it potentially influences the sustainability of these initiatives.

Clinical Question

The clinical question guiding this project was "What are the nursing staff's current knowledge, attitudes and behaviors regarding ongoing EM efforts and does re-education on the importance of EM and the current protocol change these perceived barriers?"

Aims and Objectives

The overall aim of this project was to establish perceived barriers to EM efforts amongst the nursing staff in a 10-bed medical and a 22-bed surgical ICU and determine if re-education resulted in changes of these perceived barriers.

Specific objectives of this project were to:

- evaluate the nursing staff's baseline knowledge, attitude and behaviors towards the current EM initiative using a pre-education survey
- staff re-education sessions on importance of EM
- review the current EM protocol
- same post-education survey immediately following the education sessions

Review of Literature

A literature search was conducted via the Rutgers University Health Sciences Library online database to explore the following terms: *early mobility, progressive mobility, intensive care, critical care, behaviors, knowledge, attitudes, communication, education, barriers to mobility, interdisciplinary team, interdisciplinary efforts in early mobility, sustainability in early mobility efforts, mobilization efforts with mechanical ventilation, ABCDE bundle, ABCDEF bundle, barriers to implementation, effects of immobility, effects of immobility in critical illness, ICU acquired weakness, ICUAW, American College of Critical Care Medicine, ACCM,* and *improving compliance with early mobility*. Results were limited to English language, full text, only adult critical care populations, academic journals, and study publication occurring after 2012, yielding 828 results. Most of the results came from either EBSCO host, CINAHL, Clinical Key, Web of Science, or PubMed. After limiters were applied, excluding pediatric populations, EM initiatives that do not include MV patients, EM initiatives that do not mention communication amongst team members, settings other than intensive care units, and EM initiatives that do not mention implementation or sustainability, a total of 14 articles were included in this review. An illustrated map of initial search results tapered down to final results, in the form of a PRISMA diagram can be found in Appendix A and a table of final search results can be found in Appendix B. There is a considerable gap in the literature regarding the success

and/or failure of EM initiatives after the initial implementation, as well as what strategies successful units use to sustain their compliance with EM initiatives. Thus, much of this review contains strategies used during initial protocol implementation, as well as barriers uncovered pre and post-implementation specifically as it related to knowledge, attitudes, and behaviors.

Knowledge

Most EM protocols escalate in a tiered, stepwise fashion with the major components being:

- passive range of motion
- active range of motion
- dangling on the side of the bed
- sitting in a chair
- ambulation (Bassett et al., 2012; Hermans & Van den Berghe, 2015; Schaller et al., 2016).

While it may seem intuitive that each step builds upon the next, sometimes the protocols themselves can become barriers to mobility. A knowledge deficit to either the literature base or differing viewpoints regarding at what point during an ICU admission the EM initiative should begin causes delays in mobility efforts. Most difficulties encountered with protocol-related barriers resulted from a lack of communication amongst team members, especially when a physical therapist was part of the mobility team. Since physical therapists remain the main drivers of mobility efforts, this can result in confusion regarding the role of the nurse in EM efforts (Hunter et al., 2017; Parry et al., 2017).

Knowledge-related barriers may also include a clear understanding of the inclusion and exclusion criteria of the facility's individual protocol. A firm understanding of which patients are

appropriate for rehabilitation services may lessen the time from admission to mobility provider order. Barber et al. (2015) believe making EM initiatives the standard of care would improve efforts. This is echoed by Bassett et al. (2012) who found that teams believed removing bedrest from order sets would increase sustainability. By defaulting to the EM protocol, rather than bedrest, PTs and nurses will no longer have to spend time chasing providers for orders, allowing more time for active mobilization efforts.

Attitudes

Attitudes regarding patient-related barriers can be both real and perceived. When early mobility is delayed due to perceived barriers that can be overcome, patients do not receive the benefits. Barber et al. (2014) found that endotracheal tubes and mechanical ventilation remain a perceived barrier to EM efforts. Hodgson et al. (2015) found that the main barriers to EM efforts across 12 ICUs in Australia and New Zealand were mechanical ventilation and sedation, and that no mechanically ventilated patients in the study were ambulating by day seven. In a randomized controlled study conducted by Schweickert, et al. (2009), findings showed EM of patients receiving mechanical ventilation resulted in liberation from mechanical ventilation approximately 2.5 days sooner than patients in the control group. In addition, the EM group received less total sedation and had a 50% decrease in delirium duration compared to those patients who did not receive aggressive early mobility efforts (Schweickert et al., 2009).

The main barriers preventing teams from mobilization efforts can be reduced if the effort is applied on throughout treatment, rather than later in treatment when patients are seemingly "easier" to mobilize. Waiting until the perceived barriers of an endotracheal tube and sedation are removed seemingly contributes to a cycle of increased weakness and increased delirium, which could ultimately make patients more difficult to mobilize safely. These issues continue

past ICU discharge and can significantly affect a patient's quality of life after hospital discharge. While long-term implications are not the primary focus of a critical care admission, the work that is done in an acute care setting, including a critical care admission, can lay the groundwork for a patient's success or failure after hospital discharge. In their study of acute lung injury patients, Morris et al. (2016) found that while there was no difference in hospital length of stay, days requiring a vasopressor, delirium days, days on sedation, days in restraints, or total net ICU fluid balance between an EM group and a control group. Results were seen at the 6-month follow-up, where 95% of EM patients were able to complete a 4-meter walk, compared to 88% of the control group. This potentially perpetuates the cycle of bedrest and sedation in this population, because it is easier, and the results may not seem worth it to team members accustomed to seeing immediate results from an intervention.

Continuity of EM efforts should also apply to the overnight teams, as the importance of providing the opportunity for quality sleep should not be overlooked. Mobility needs to be a 24-hour a day focus, even if patients are not being actively mobilized for most of those hours. By making mobility a standing topic during both day and night huddles, Johnson, Petti, Olson, and Custer (2017) were able to engage staff members on both shifts in the initiative, and opportunities were opened to clarify orders, as well as address concerns with other members of the team.

Mobilizing critically ill patients requires an army of personnel, as there are many inter-related factors, and communication between practitioners is pivotal. To more clearly define individual roles, and facilitate communication between interdisciplinary care providers, rounds are a common theme throughout the literature. Daily rounds are useful in establishing

interdisciplinary mobilization goals and identifying barriers, as well as for program sustainability (Bassett et al., 2012; Schaller et al., 2016).

Costa, et al. (2017) define contextual barriers as barriers related to the environment in which care is provided. Contextual barriers cover factors such as staffing, equipment, workload, and unit culture. Contextual barriers can be both modifiable and non-modifiable. Unfortunately, staffing concerns tend to be a non-modifiable barrier to mobilization, and the multifactorial components to staffing are beyond the scope of this paper, but an opportunity for further research could include looking at the relationship between staffing ratios in critical care units and mobilization efforts.

Behaviors

As with the implementation of any order within the hospital setting, the implementation of EM is more likely to occur if there has been some sort of communication prior. Poor communication amongst team members and lack of accountability towards individual roles in the interdisciplinary team, means that EM orders are not carried out (Barber et al., 2014). Acute care settings are dynamic environments, and unfortunately, just because an order is on a patient's chart, does not necessarily mean it gets implemented the way it was intended. There needs to be mutual accountability amongst all team members, as this creates a stronger fabric of respect and understanding towards the importance other roles play in the interdisciplinary team.

Poor communication amongst team members can result in inappropriate orders, as seen in a study by Hunter, George, Ren, Morgan, Rosenzweig, and Tuite (2017). This is especially important when multiple specialties are being consulted on the same patient. All team members should coordinate goals when possible. This can be difficult as the same clinicians may not see the same patient day after day. Shift-work can lead to breaks in continuity of care. Thus, goal

implementation across shifts should be facilitated using closed-loop communication (Schaller et al., 2016).

In a one-day, point prevalence study across 42 ICUs in 17 U.S. hospitals, non-mechanically ventilated patients were significantly more likely to receive PT/OT (48%), compared to patients who were mechanically ventilated (26%; Jolly et al., 2017). In addition, only 16% of patients receiving mechanical ventilation achieved out-of-bed mobility, with only 4% progressing to ambulation, compared to the 56% of non-mechanically ventilated patients who achieved out-of-bed mobility (Jolly et al., 2017). The aim of this project was to report on the prevalence of PT and occupational therapy-provided mobility in respiratory failure patients, determine the type and frequency of mobility in ICUs, and identify factors associated with EM progression (Jolly et al., 2017). Jolly et al. (2017) concluded that there can be a substantial difference between reported EM efforts compared to actually delivered EM efforts and that further studies are needed to better understand organizational differences affecting EM uptake and sustainability of EM efforts.

Equipment, workload and culture can all be viewed as quasi-modifiable barriers, under specific conditions, such as a large budget. EM initiatives can be performed with as little equipment as a ceiling or hover lift and resistance bands or as much as cycle ergometers standing equipment. Lack of equipment only becomes a barrier when the unit perceives it as a barrier (Eakin, Ugbah, Arnautovic, Parker, & Needham, 2015). Discussing interdisciplinary barriers amongst team members was important in highlighting changeable barriers and improving patient outcomes and determining mobility goals (Johnson et al, 2017; Parry et al., 2017; Schaller et al., 2016)

Workload and unit culture often intertwine. Nurses and respiratory therapists are pulled in many different directions, often simultaneously, throughout the course of a shift. Emergencies occur, and staff are forced to prioritize, often between the "stable" patient who still needs considerable therapy and the unstable patient. Daily interdisciplinary mobility rounds allow for the mobility team to coordinate care, establish mutual goals, and collaborate amongst each other (Bassett et al., 2012; Castro, Turcinovic, Platz, & Law, 2015; Hunter et al., 2017). By having already discussed barriers and interdisciplinary concerns, primary staff may feel more at ease delegating EM initiatives to other team members, should an emergency with another patient arise. For EM initiatives to be sustainable, they need to be imbedded into the fabric of the unit using open communication regarding barriers and group schedules (Bassett et al., 2012; Eakin et al., 2015).

Theoretical Framework

Given the performance improvement viewpoint of this project, it was quite suited to the Plan-Do-Study-Act framework. Terhaar (2016) describes the PDSA model as focused on small-scale improvements, completed in rapid sequential cycles, ultimately ending in sustainable improvement. The planning phase included concept formation, developing education materials, and modification of the survey tool. The do phase involved project implementation and education sessions. The study phase allowed for analysis of survey results. The final phase, act, allowed stakeholders the opportunity to explore options for future practice change based on project findings.

The secondary conceptual framework involved how knowledge affects attitudes and behaviors. Cabana, Rand, Powe, Wu, Wilson, Abboud & Rubin (1999) surmised that before a change is made in clinical practice, that change must first affect a provider's knowledge, attitude,

and finally behavior. Behavior change that comes as the result of influencing knowledge is potentially more sustainable than change that has resulted through behavior manipulation (Cabana, et al., 1999). Schrader & Lawless (2004) found that successful educational and performance improvement interventions involved more than knowledge gains, and that knowledge alone is a poor means for changing behavior. The knowledge, attitude and behavior (KAB) framework allows for a more comprehensive understanding associated with changes in behavior (Schrader & Lawless, 2004). The KAB method has been shown to be valid and reliable method to evaluate changes resulting from an intervention (Schrader & Lawless, 2004).

Methodology

This quality improvement project used a quasi-experimental approach utilizing a validated survey tool, created by Hoyer, Brotman, Chan & Needham (2015). The 26-item John's Hopkins Medicine Healthcare Solutions Patient Mobilization Attitudes, & Beliefs Survey tool utilized a 5-point Likert scale, and evaluates the knowledge, attitudes, and behaviors of staff specifically regarding early mobility interventions (Hoyer, et al., 2015). Cronbach alpha coefficients of internal consistency were found to be acceptable at 0.72 or greater for the overall scale and all three subscales (Hoyer, et al., 2015). In addition, inter-subscale correlations were found to be acceptable at 0.49-0.94 and the correlation between each item and its predicted subscale and the Overall Provider Barriers scale were acceptable, generally exceeding 0.40 (Hoyer, et al., 2015).

While the Patient Mobilization Attitudes & Beliefs survey allowed for interdisciplinary opinions on barriers to mobilization, this project focused specifically on nursing, thus questions B and C were eliminated, as they pertained to interdisciplinary role demographics. In addition, the phrase hospitalized patients in question E was changed to critical care patients. Minimal

changes were made to the 26-item knowledge, attitudes and beliefs section of the survey tool. The term inpatient was changed to patient and respiratory therapist was added to the list of providers in question eight. Question thirteen was eliminated as it relates to opinions regarding increasing the workload of the PT, who are not being included in this project (Hoyer, et al., 2015).

Staff education refresher sessions were conducted, focusing on benefits of EM, literature review, and review of the organization's existing level 1-4 EM protocol:

- level 1: passive range of motion,
- level 2: increasing head of bed tolerance to 65 degrees
- level 3: active range of motion, dangling and out of bed sitting in a chair
- level 4: ambulation

The Patient Mobilization Attitudes & Beliefs survey tool was administered anonymously pre-education and immediately post-education.

Setting

This project took place in a 10-bed medical intensive care unit (MICU) and a 22-bed surgical intensive care unit (SICU), located within a 724-inpatient bed, teaching, regional medical center in Northern New Jersey. The medical and surgical intensive care unit team consisted of a pulmonary critical care attending physician or trauma surgeon, a rotating team of medical residents and interns, nursing staff with a ratio of 1:1 to 1:3 depending on patient acuity, a nursing assistant and a respiratory therapist who may also be assigned to neighboring units. The staff care for critically ill patients suffering from a variety of different diagnoses, including but not limited to various types of respiratory failure, sepsis, hemodynamic instability, as well as single organ and multi organ failure.

Project Population

The SICU/MICU employed approximately 70 full-time, part-time and per-diem nurses. Inclusion criteria were those nurses who provide direct patient care during both 12-hour day shifts, and 12-hour night shifts. Exclusion criteria were those staff members who do not provide direct patient care, such as coordinators, educators, and upper management, as well as any travel or agency nurses in the unit during the project time period, as his or her previous experience with protocols in other facilities could skew survey results, making them not representative of unit practice.

The independent variable for this quality improvement project was the education sessions and the knowledge, attitudes and behaviors of these nurses was considered the dependent variable as they were subject to change based on the education sessions. To facilitate secondary analysis on sub-groups, years of experience in the unit and primary unit was collected.

Subject Recruitment and Sampling

As this was a quality improvement project taking place in a hospital, staff members were encouraged to participate. A convenience sample of full-time, part-time and per diem nurses working 12-hour shifts in the medical and surgical ICUs was offered the opportunity to attend one of the educations sessions. Staff was made aware that participation in the pre and post-surveys was voluntary, anonymous, and will not have any direct impact on their employment. While the surveys were anonymous, a sign-in sheet was used.

A priori power analysis was performed to determine sample size. Using the G*Power 3.1.9.2 calculator (2007), in order to obtain two-tailed results with an effect size of 0.5, a p-value of 0.05 and a 95% CI, a sample size of 54 nurses were needed.

Consent Procedure

A waiver of informed consent was requested and granted from the project site's IRB as the only demographic information being collected is years of experience in the unit. No other identifying information was collected.

Risks/Harms

As this was a quality improvement initiative on an existing protocol, the incremental risks to staff were minimal and include potential distraction causing a paradoxical lowering of morale, however, the research project team will make every effort to mitigate these risks through offering multiple sessions on varying dates and times. The risks to patients were expected to be minimal as inclusion in EM initiatives is part of the standard of care these patients are already receiving and no changes to the existing EM protocol were made.

Subject Costs and Compensation

Project participants did not incur any financial costs nor receive any financial compensation. Light refreshments were included at formal EM education sessions at the cost of the PI.

Project Interventions

The project consisted of a validated survey tool focusing on staff knowledge, attitudes and behaviors regarding early mobility. The results of these pre-implementation surveys were compared to the same survey administered to staff immediately after the education sessions. The survey was adapted from Hoyer, et al. (2015). Surveys utilized an ascending 5-point Likert format where a score of one represents strongly disagree and a score of five represents strongly agree, with a middle neutral option. A request for tool use was sent through the Johns Hopkins Physical Medicine and Rehabilitation Activity and Mobility Promotion (AMP) website, with full

access to the AMP toolkit granted via email. A copy of the adapted survey tool used can be found in Appendix D.

A minimum of three EM education sessions were held with the staff utilizing both formal and informal sessions as needed to boost attendance. Copies of PowerPoint education material and references used were made available. Topics included the importance of EM with regards to physiologic processes, review of the already existing EM protocol, and literature review. These sessions were held at various times of the day, including mornings, afternoons, and evenings.

Outcomes Measured

The pre-education survey results were used to obtain information regarding baseline knowledge, attitudes, and behaviors regarding EM as perceived by bedside RNs. Brief education sessions addressed the importance of EM efforts as from both a physiologic and evidence-based perspective and included a review of the site's current EM protocol. The same survey tool was administered as a post-test immediately after completion of these education sessions.

Results of the pre/post-surveys remained anonymous; however, sign-in list was used. Staff survey results were compared against one another and the means for each 5-point Likert question was used. Demographic data analyzed included whether the nurse works primarily in the surgical ICU or the medical ICU, as well as the nurse's years of experience caring for critically ill patients. Experience was ranked as novice (0-5 years), intermediate (6-10 years) or expert (over 11 years).

Project Timeline

This project proposal took place throughout 2018 and will culminate with closure of the IRB in May 2019. Planning and development occurred from January 2018 until early August 2018. Mid-August 2018 was used for final revisions prior to applying to the project site IRB in

early September 2018. Hospital IRB was obtained November 2018 and the proposal was sent to the Rutgers University IRB for final approval which was obtained in early December 2018. Once IRB approval was obtained, staff surveys and education sessions began. Two months were allocated for data collection and one month allocated for data analysis, data evaluation and writing. Project presentations, including final project presentation, are expected to occur in April of 2019, followed by closure of the IRB in May 2019. A proposed timeline, in GANTT format be found in Appendix E.

Resources

Costs for this proposal were minimal and were the sole responsibility of the PI and included light refreshments for formal education sessions, and paper for handouts and test materials. No additional equipment other than what is already available within the unit was used. Staff and patients did not receive compensation for their participation. No additional funding, such as grants, was obtained. Statistical analysis was completed in Excel 2016 therefore no additional software purchase was necessary. This project took place with full support of the SICU/MICU leadership team. A proposed budget can be found in Appendix F.

Results

Data Analysis

Descriptive statistics was used for the survey section of this proposal. Analytical statistics was used to determine project efficacy. Statistical analysis was run using Excel 2016. Wilcoxon signed rank tests were used, as each planned analysis involved comparing the medians of the pre-intervention groups and the post-intervention groups.

Data collection took place from December 2018 to February 2019. A total of 32 surveys were completed pre and post-education sessions out of a proposed 54, resulting in a response rate of 59%. Nurses who primarily work in the surgical ICU had the highest proportion of respondents (72%) compared to the medical ICU (28%). Data collection favored more informal sessions at the nurses' station rather than formal sessions in the break room. Critical care nursing experience was also analyzed with 0-5 years of experience considered novice, 6-10 years considered intermediate, and >11 years considered expert. Pre-test (n=32) analysis of experience resulted in the highest proportion of novice nurses (44%), followed by expert (41%), and lastly intermediate (16%). Experience was not noted on 2 post-test surveys (n=30) resulting in slightly different post-test demographic analysis, however the breakdown order of novice (43%), expert (40%) and lastly intermediate (17%) remained consistent. Critical care nursing experience ranged from 1 to 30 years (M=10.87, SD=8.49). Experience was non-normally distributed with skewness of 0.61 and kurtosis of -0.89 (SE=1.5). A full breakdown of the descriptive statistics can be found in Table 1 and Table 2.

Knowledge, attitudes and behaviors were measured using a 5-point Likert scale tool adapted from Hoyer, et al. (2015) where options for answers range from 1=strongly disagree to 5=strongly agree, including a middle neutral option. Wilcoxon signed rank tests were performed as the sample size was small. Results of the pre and post-test median survey responses were analyzed according to question grouping (knowledge, attitude, or behavior) for total respondents and sub-analysis was performed for primary SICU, primary MICU, as well as experience category (novice, intermediate or expert). Negatively worded questions were reverse coded. A categorical breakdown of survey questions can be found in Table 3. There was a statistically significant change in attitude when total survey responses were analyzed (p=0.022), however

there was not a significant change in knowledge (p=0.246), behavior (0.579), or the overall survey responses (p=0.166), and further sub-analysis of primary unit and critical care experience did not produce statistically significant results. Complete results of the analysis and sub-analysis groups can be found in Table 4 and Table 5.

Maintenance and Security

The PI provided an attendance list for education sessions. Pre-tests and post-tests were labeled with a sequential number ranging from 01-54 and kept in separate, labeled, folders located in a locker within the surgical ICU. The master attendance list linking staff names was kept separate from the list containing project aggregate data. Only the PI had access to the master list which was kept in a locker within the project site. Staff surveys were completed on paper and pens were provided to provide additional anonymity. Only de-identified data was used for analysis. Upon completion of the surveys and closure of the IRB, all data will be destroyed in accordance with Rutgers University guidelines. Aggregate data will be stored in the online repository of Rutgers University.

Limitations

This was a single-site QI project with a pre-existing EM protocol therefore the results may not be generalizable to other intensive care units. The PI was a staff member on the unit where the project was conducted, thus there could have been involvement bias from staff members who would not otherwise have participated. A follow-up survey at 1-month post intervention was eliminated due to time constraints, so the results cannot be generalized past immediately post-intervention. Data collection took longer than anticipated and occurred during a time of high census and short staffing and resulted in fewer respondents than the original project was designed to include, thus potentially altering the overall significance of the project.

Despite the anonymous nature of the project design, it is possible that staff feared repercussions and altered their answers to more sensitive questions, thus making the results not entirely reflective of staff attitudes.

Summary and Discussion

There is an extensive body of literature supporting the benefits of early mobility in the critical care population, however there is a considerable gap in the literature discussing sustainability of these initiatives once the protocol is implemented. Using an adapted version of the Hoyer, et al. (2015) knowledge, attitudes and behaviors 5-point Likert survey tool, this project looked to see if educating the bedside critical care nurse had any effect on their perceived barriers to early mobility in the intensive care unit.

A convenience sample of 32 critical care nurses from a large medical center in northern New Jersey were given the survey pre and post an education session on early mobility, including a review of the existing protocol. Wilcoxon signed rank analysis was performed, resulting in a statistically significant change in attitudes ($p=0.022$) between the pre and post-tests. This corresponded with the knowledge, attitudes, and behaviors framework stating that in order to enact change in clinical practice, first one must impart knowledge which leads to changes in attitude and eventually changes in behavior. As the post-test survey was administered immediately after the education session, it is possible that not enough time had passed to determine if this intervention resulted in changes in behavior and further research are needed to confirm this hypothesis.

Potential implications for this project include decreased ICU length of stay, decreased ventilator days, decreased ventilator-associated events, and decreased delirium, all of which pose

significant financial savings for stakeholders. In addition, this project may provide additional opportunities for quality improvement focused specifically on minimalizing or eliminating perceived barriers. Further studies would be needed to confirm those hypotheses.

The results of this data will be presented at the project site as well as Rutgers University in the form of poster presentations. After final completion of the manuscript, it will be submitted to both nursing and respiratory care journals for consideration and potential publication.

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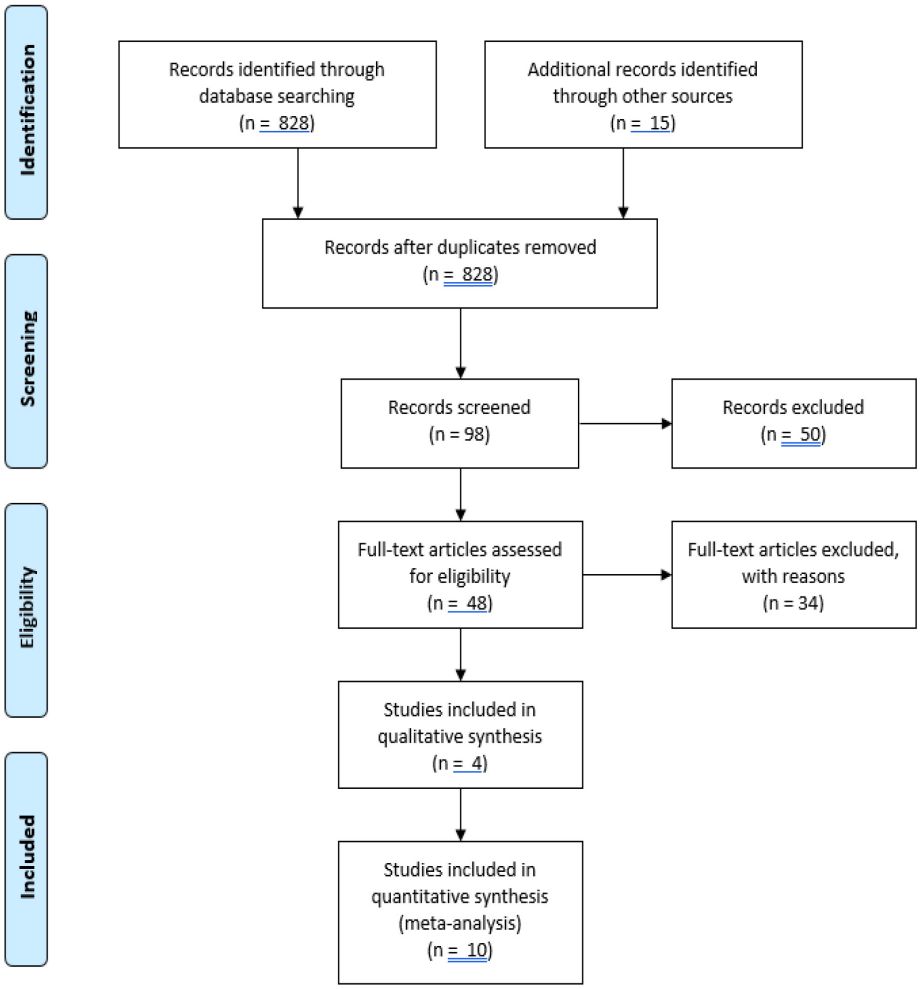
Appendix A

PRISMA Diagram



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit www.prisma-statement.org.

Appendix B

Table of Evidence

EBP Question:

Do Focused Interdisciplinary Rounds Improve Compliance with a Progressive Mobility Initiative Compared to the Standard Practice of PT/MD-Focused Mobility Goals?

Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study Finding that Help Answer the EBP Question	Limitations	Evidence Level & Quality
1	Parry, S.M., Remedios, L., Denehy, L., Knight, L.D., Beach, L., Rollinson, T.C…., Granger, C.L. (2017)	Qualitative	• 25 multi-disciplinary participants • Purposeful sampling • 2 ICU tertiary hospitals • 2 Focus groups – MD/RN and PT	• 6 themes and 14 subthemes identified as factors that influence early mobility • PT main drivers of rehab in unit • Successful examples described for communication with all team members • Discussing barriers with team members important in highlighting changeable barriers	• Predominately PTs in focus groups (16/25) • Average level of experience lowest for PTs • Experience may have influenced clinician beliefs	III-B

2	Hodgson, C., Bailey, M., Higgins, A., Bellomo, R., Berney, S., Buhr, H., . . . Webb, S. (2015)	Prospective, multi-center cohort	• 12 ICUs across Australia and New Zealand • 6 tertiary hospitals, 4 metropolitan, 2 rural • 192 patients • Previously independent and expected >48hr intubation	• Main reported barriers to early mobilization were intubation and sedation • 36.5% received EM during mechanical ventilation • Median time to mobility was 5 days • No mechanically ventilated patients were walking by day 7	• 1 site did not record total number of patients screened • Mobilization not measured beyond 14 days • Mobilization not measured beyond day of extubation • Did not include long-stay patients	III-B
3	Castro, E., Turcinovic, M., Platz, J., & Law, I. (2015)	QI	• 18 bed SICU • Post-surgical, renal transplant, and Level 1 trauma critically ill patients • 37/56 survey response 2 weeks pre-implement • 36/56 at 6mo and 1yr survey follow-up	• 5AM rounds with SICU attending/ intensivist, RN and RT • If deemed eligible, RT performs vent weaning protocol • Expedites EM process • Added to orientation curriculum of new staff	• May not be generalizable across other patient populations	V-B

				• Interdisciplinary team may have helped in alleviating the challenge of coordinating personnel necessary to facilitate transfers • EM goal should be in place and RN/PT should be in partnership		
4	Honiden, S. & Connors, G.R. (2015)	Non-research		• Interdisciplinary goals list • Change initiatives need to foster a commitment that sustains motivation • Redesign processes to reduce waste, overburden and inconsistency		V-B
5	Hunter, O.O., George, E.L., Ren, D., Morgan, D., Rosenzweig,	QI with evaluation component	• 10 bed CCU • University-affiliated teaching hospital	• Barriers include confusion regarding RN vs PT responsibilities in EM	• Small sample size • Underpowered • Pre/post test not piloted, and	V-B

	M., & Tuite, P.K. (2016)		• 23 post-intervention sample size	• PT, charge RN and bedside RN discussed mobility goals • 78% protocol compliance • Decreased bedrest orders • Daily mobility rounds allowed for PR/RN to collaborate care • Poor communication led to 3 inappropriate bedrest orders	therefore not validated	
6	Barber, E.A., Everard, T., Holland, A.E., Tipping, C., Bradley, S.J., & Hodgson, C.L. (2014)	Qualitative descriptive	• 25 ICU clinicians • Alfred Hospital in Melbourne, Australia • 3 separate focus groups (MD, RN, and PT) • Purposeful sampling	• Despite knowledge that an ETT is not a barrier to EM, it remains a perceived barrier • Difficulties in communication amongst staff hindered EM • Lack of communication and accountability meant EM orders	• Single-center design reduces external validity	III-B

				not carried through • EM as standard with criteria for exceptions would raise EM • Multidisciplinary team planning identified by all groups as being important to developing daily goals and combining functional activities		
7	Johnson, K., Petti, J., Olson, A., & Custer, T. (2017)	Pre/post-test intervention	• 22 bed trauma ICU • Trauma and neuro critical care patients • Level 1 trauma hospital • 31 RNs and charge RNs	• EM was a standing topic on daily huddles (both shifts) • Overall increase in post-test scores support that understanding barriers to EM can improve patient outcomes	• Pre-existing relationship between co-investigator and nursing staff • Further evaluation of the survey tool is needed to test its validity	V-B
8	Bassett, R.D., Vollman, K.M., Brandwence, L., & Murray, T. (2012)	Qualitative and Quantitative	• 13 ICUs • 8 hospitals • New initiative rollout	• Communication and collaboration amongst all	• PI initiative • No designated data collector • Data aggregated at	V-B

				disciplines was critical • Mutual accountability amongst all team members created a stronger culture of respect and understanding of all care roles • Integration of EM into the fabric of daily work • Rounds listed in elements for sustainability • Team engagement is critical • 57% PT consultation on ICU day 1 • First PT session on average 1.5 days after intubation versus day 7 in control	each site limited the ability to statistically analyze based on individual patient process • Illness severity not included	
9	Schweickert, W.D., Pohlman, M.C., Pohlman, A.S., Nigos, C.,	RCT	• ICUs in 2 medical centers • 104 patients	• Intervention group underwent therapy at median of day	• Results cannot be directly applied to all	I-A

	Pawlik, A.J., Eastbrook, C.L.,…Kress, J.P. (2009)		• Sedated adults in the ICU who have been intubated <72hrs • Computer-generated randomized groups	1.5 compared to day 7.4 • Total sedation duration longer in control group • Median duration of ICU delirium half as long in intervention group	patients receiving MV • Independent in pre-morbid health	
10	Schaller, S.J, Anstey, M., Blobner, M., Edrich, T., Grabitz, S.D., Gradwohl-Matis, I.,…Eikermann, M. (2016)	RCT	• SICUs • 5 university hospitals in Austria, Germany, and the US • 1:1 ratio • 200 patients • Intubated <48hrs and expected to remain intubated >24hrs	• Mobilization goal defined during AM rounds • Goal implementation across shifts facilitated by closed-loop communication • Interdisciplinary team meeting to discuss goals and barriers • Intervention group achieved earlier and higher level mobilization • 52% ambulation in intervention group compared	• Generalizability to non-SICU patients may be restricted • Patients had no barriers to mobility prior to ICU admission • Non-ventilated patients excluded	I-B

				to 25% in control • Mean decrease in ICU stay of 3 days • Support creating an interprofessional algorithm to guide EM		
11	Morris, P.E., Berry, MJ., Files, C., Thompson, J.C., Hauser, J., Flores, L.,…Young, M.P. (2016)	RCT	• Single-center • Adult patients admitted to ICU with acute respiratory failure requiring mechanical ventilation • 300 patients • Computer-generated randomized groups	• No difference in hospital LOS • No difference in days requiring a vasopressor, CAM+ days, days on sedation, days in restraints, or ICU-related net fluid balance • 4-meter walk ability improved at 6mo follow-up – 95% for intervention compared to 88% control	• Higher than expected drop out rate • No therapy following D/C • No explicit sedation protocol	I-C
12	Costa, D.K., White, M.R., Ginier, E., Manojlovich, M., Govindan,	Systematic Review	• 49 studies • January 1, 2007 – August 31, 2016	• 4 classes of barriers to ABCDE bundle 1. Patient-related	• Barriers not ranked in order of importance • Variation in patient	III-B

	S., Iwashyna, T.J., & Sales, A.E. (2017)		• Thematic content analysis of 107 barriers to ABCDE bundle	2. Clinician-related 3. Protocol-related 4. ICU contextual barriers • Evaluate interprofessional staffing patterns and the ability of the team to coordinate • Does a modality exist for the team to discuss EM goals and potential barriers? • Implementation plan should be tailored to unit-specific context and barriers	populations across studies reviewed	
13	Jolley, S.E., Moss, M., Needham, D.M., Caldwell, E., Morris, P.E., Miller, R.R.,… & Hough, C.L. (2017)	Cross-sectional point prevalence	• 42 ICUs across 17 ARDSNet hospitals • Adult patients (>18y/o) with acute respiratory	• Patients received MV on 73% of patient days • 56% received MV via an ETT • Prevalence of PT/OT mobility in MV patients was 32%	• Unblinded assessments, potentially leading to increased mobility efforts • Participation voluntary and limited to	III-B

			• 744 unique patients • 770 patient-days of data	• Non-MV patients had PT/OT prevalence of 48% • MV patients achieved OOB mobility on 16% of total patient days • Only 4% of MV patients progressed to ambulation • PT/OT involvement strongly correlated with OOB • Presence of ETT and delirium were negatively associated with OOB	ARDSNet facilities, potentially limiting the generalizability of the results • Study only conducted M-F, may lead to overestimation of mobility efforts	
14	Eakin, M.N., Ugbah, L., Arnautovic, T., Parker, A.M., & Needham, D.M. (2015)	Qualitative	• Semi-structured interviews • 20 interdisciplinary staff and faculty involved with the EM initiative in the MICU at John's	• Factors that help program sustainability identified • Buy-in was the most reported construct (100%) necessary for	• Small sample size • All participants work in the same ICU, so results may not be generalizable	III-B

			Hopkin's Medical Center • Purposeful sampling • Retrospective evaluation • Consolidated Framework for Implementation Research (CFIR)	successful EM initiative • Multidisciplinary team (90%) with open communication • Only minimal equipment was needed, and lack of specialized equipment should not be a barrier to EM • Group schedules recognize the importance of team communication and scheduling for patients that may require multiple providers simultaneously or who have multiple procedures scheduled • Barriers of staff workload and safety concerns decreased over time	• Social desirability may have influenced interview responses	

Appendix C

Concept Map

Appendix D

Patient Mobilization Attitudes & Beliefs Survey

In this survey we would like to know about your opinions regarding mobilization of critical care patients. Completion of this survey represents your consent to participate in a study interested in your knowledge, attitudes, and beliefs regarding early mobility.

A. **Please indicate the unit you work most often in**:
   SICU
   MICU

B. **Please specify the number of years_____ and/or months_____ you have spent caring for critical care patients**

Instructions:

- Mobilizing patients means to get them out of bed or ambulating
- For each statement below, please fill in only ONE response that most accurately reflects your opinion based on experience over the past *1-2 weeks*

1. **My patients are too sick to be mobilized**:
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

2. **I have received training on how to safely mobilize my patients:**
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

3. **Increasing mobilization of my patients will be harmful to them (i.e. falls, IV line removal, etc.):**
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

4. **A physical therapist or occupational therapist should be the primary care provider to mobilize my patients:**
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

5. **I know which patients are appropriate to refer to physical therapy:**
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

6. **I know which patients are appropriate to refer to occupational therapy:**
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

7. **I we don't have the proper equipment and/or furnishings to mobilize my patients**:
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

8. **The physical functioning of my patients is regularly discussed between the patient's healthcare providers (nurses, physicians, physical therapists, occupational therapists, respiratory therapist):**
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

9. **Nurse-to-patient staffing is adequate to mobilize patients on my unit:**
   1 – strongly disagree
   2 – disagree
   3 – neutral
   4 – agree
   5 – strongly agree

10. **My patients have contraindications to be mobilized:**
    1 – strongly disagree
    2 – disagree
    3 – neutral
    4 – agree
    5 – strongly agree

11. **Unless there is a contraindication, my patients are mobilized *at least once daily* by *Nurses*:**
    1 – strongly disagree
    2 – disagree
    3 – neutral
    4 – agree
    5 – strongly agree

12. **Increasing mobilization of my patients will be more work for nurses:**
    1 – strongly disagree
    2 – disagree
    3 – neutral
    4 – agree
    5 – strongly agree

13. **My departmental leadership team is very supportive of patient mobilization:**
    1 – strongly disagree
    2 – disagree

3 – neutral
4 – agree
5 – strongly agree

14. Increasing the frequency of mobilizing my patients increases my risk for injury:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

15. Patients who can be mobilized usually have appropriate physician orders to do so:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

16. My patients are resistant to being mobilized:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

17. I believe that my patients who are mobilized at least three times daily will have better outcomes:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

18. I am not sure when it is safe to mobilize my patients:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

19. Family members of my patients are frequently interested to help mobilize them:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

20. I do not feel confident in my ability to mobilize patients:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

21. I document the physical functioning status of my patients during my shift/work:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

22. I do not have time to mobilize my patients during my shift/work:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

23. Unless there is a contraindication, I educate my patients to exercise or increase their physical activity while on my hospital unit:
1 – strongly disagree
2 – disagree
3 – neutral
4 – agree
5 – strongly agree

24. My patients have time during their day to be mobilized at least three times daily:
1 – strongly disagree
2 – disagree
3 – neutral

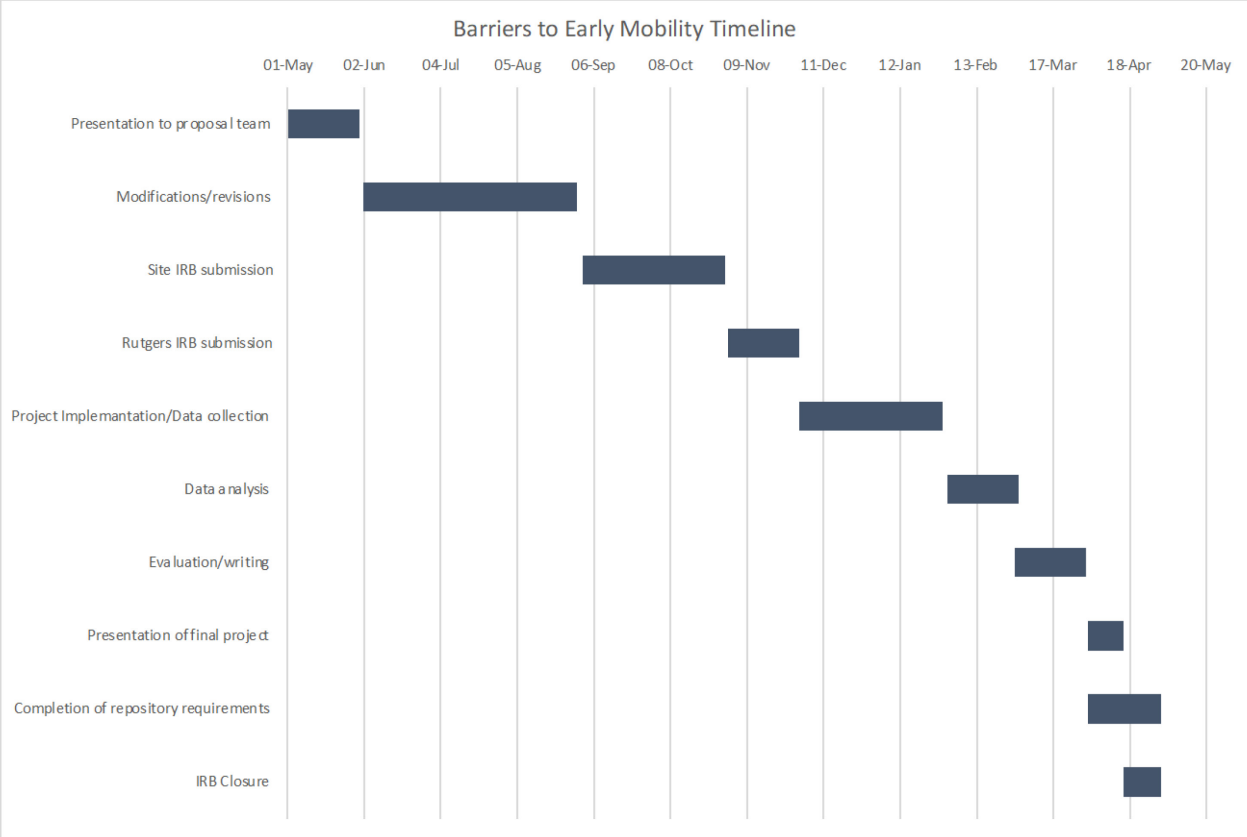
4 – agree
5 – strongly agree

Do you feel there are other issues regarding patient mobility that was not covered in this survey? If yes, specify below:

Hoyer, et al. (2015)
Version 1
9/1/18

Appendix E

Anticipated Project Timeline



Appendix F

Anticipated Project Budget

Expense	**Cost**	**Total Cost**
Printed Education Materials	350 @ 0.15	$52.50
Refreshments	$20 x 3 sessions	$60
Dissemination Posters	$75	$75

Total estimated costs - $187.50

Version 2 – 8/16/18

Table 1

Descriptive Statistic Results

Survey ID	SICU	MICU	Experience (Years)
1	1		15
2	1		10
3	1		2
4	1		3.08
5	1		4
6	1		18
7	1		17
8	1		3
9		1	4
10		1	1.75
11	1		20
12	1		24
13	1		14.75
14		1	19
15	1		25
16	1		1
17		1	24
18	1		4
19	1		5
20	1		10
21		1	5.25
22	1		5
23	1		3.34
24		1	7
25	1		2
26		1	30
27	1		19
28	1		13
29		1	8
30		1	21
31	1		1.25
32	1		8.5
Total (N=32)	23	9	

Table 2

Experience Descriptive Statistics

Experience (Y)	
Mean	10.87
Standard Error	1.50
Median	8.25
Mode	4.00
Standard Deviation	8.49
Sample Variance	72.13
Kurtosis	-0.89
Skewness	0.61
Range	29.00
Minimum	1.00
Maximum	30.00
Sum	347.92
Count	32.00

Table 3

Survey Tool Organized by Question Category

Knowledge
2. I have received training on how to safely mobilize my patients
5. I know which patients are appropriate to refer to physical therapy
6. I know which patients are appropriate to refer to occupational therapy
23. Unless there is a contraindication, I educate my patients to exercise or increase their physical activity while on my hospital unit
Attitudes
1. My patients are too sick to be mobilized*
3. Increasing mobilization of my patients will be harmful to them*
4. A physical therapist or occupational therapist should be the primary care provider to mobilize my patients*
12. Increasing mobilization of my patients will be more work for nurses*
17. I believe that my patients who are mobilized at least three times daily will have better outcomes
18. I am not sure when it is safe to mobilize my patients*
20. I do not feel confident in my ability to mobilize my patients*
24. My patients have time during their day to be mobilized at least three times daily
Behaviors
7. I don't have the proper equipment and/or furnishings to mobilize my patients*
8. The physical functioning of my patients is regularly discussed between the patient's healthcare providers
9. Nurse-to-patient staffing is adequate to mobilize patients on my unit
10. My patients have contraindications to be mobilized*
11. Unless there is a contraindication, my patients are mobilized at least once a day by nurses
13. My departmental leadership team is very supportive of patient mobilization
14. Increasing the frequency of mobilizing my patients increases my risk for injury*
15. Patients who can be mobilized usually have physician orders to do so
16. My patients are resistant to being mobilized*
19. Family members of my patients are frequently interested to help mobilize them
21. I document the physical functioning status of my patients during my shift/work
22. I do not have time to mobilize my patients during my shift/work

*Indicates questions that have been reverse coded

Table 4

Pre/Post Survey Analysis

Education – Total				
	Pre n=32	Post n=32	Difference n=32	p-value
Knowledge	15 (9-19)	16 (10-19)	1 (-6-7)	0.246
Attitude	28 (17-33)	30 (15-36)	1 (-8-12)	0.022
Behavior	40.5 (27-52)	43 (24-51)	1 (-19-23)	0.579
Total	84 (57-99)	89 (55-102)	3.5 (-31-42)	0.166
SICU				
	Pre n=23	Post n=23	Difference n=18	p-value
Knowledge	14 (9-19)	16 (10-19)	1.5 (-6-7)	0.379
Attitude	28 (17-33)	31 (21-36)	2 (-8-12)	0.142
Behavior	40 (27-52)	43 (29-51)	2 (-19-23)	0.492
Total	83 (57-99)	90 (64-102)	6.5 (-31-42)	0.306
MICU				
	Pre n=9	Post n=9	Difference n=4	p-value
Knowledge	16 (14-19)	16 (15-18)	0 (-3-1)	0.855
Attitude	29 (25-31)	29 (15-31)	1 (-1-2)	0.361
Behavior	41 (37-46)	42 (24-46)	-4 (-8-3)	0.361
Total	85 (79-96)	85 (55-94)	-3.5 (-11-6)	0.465

median (min-max), p-value calculated using Wilcoxon Signed Rank

Table 5

Pre/Post Survey Sub-Analysis by Years of Critical Care Experience

Novice (0-5)				
	Pre n=13	Post n=12	Difference n=7	p-value
Knowledge	14 (12-18)	16 (10-19)	3 (-1-5)	0.059
Attitude	28 (17-31)	30 (15-34)	3 (-2-9)	0.093
Behavior	40 (27-46)	43.5 (24-51)	-1 (-4-12)	0.8
Total	83 (57-91)	89.5 (55-102)	5 (-2-23)	0.205
Intermediate (6-10)				
	Pre n=5	Post n=5	Difference n=2	p-value
Knowledge	16 (13-19)	16 (12-19)	-3 (-5--1)	0.371
Attitude	30 (20-32)	30 (24-31)	-1.5 (-8-5)	>0.999
Behavior	43 (37-44)	39 (29-46)	-8.5 (-12--5)	0.371
Total	83 (78-92)	85 (67-94)	-13 (-25--1)	0.371
Expert (>11)				
	Pre n=14	Post n=13	Difference n=8	p-value
Knowledge	16 (9-19)	16 (11-19)	0.5 (-3-7)	0.463
Attitude	29 (22-33)	30 (21-36)	1.5 (-2-12)	0.093
Behavior	40 (28-52)	41 (31-51)	0 (-8-23)	>0.999
Total	85 (59-99)	86 (64-101)	1 (-6-42)	0.529

median (min-max), p-value calculated using Wilcoxon Signed Rank