

5-2017

## Improving Patient Outcomes: Early Mobilization of Intensive Care Patients

Casey Teves  
*University of Massachusetts Boston*

Follow this and additional works at: [https://scholarworks.umb.edu/honors\\_theses](https://scholarworks.umb.edu/honors_theses)



Part of the [Other Public Health Commons](#), and the [Public Health and Community Nursing Commons](#)

---

### Recommended Citation

Teves, Casey, "Improving Patient Outcomes: Early Mobilization of Intensive Care Patients" (2017). *Honors College Theses*. 26.

[https://scholarworks.umb.edu/honors\\_theses/26](https://scholarworks.umb.edu/honors_theses/26)

This Open Access Honors Thesis is brought to you for free and open access by ScholarWorks at UMass Boston. It has been accepted for inclusion in Honors College Theses by an authorized administrator of ScholarWorks at UMass Boston. For more information, please contact [scholarworks@umb.edu](mailto:scholarworks@umb.edu).

Improving Patient Outcomes: Early Mobilization of Intensive Care Patients

Casey Teves

Honors College Thesis, May 2017

University of Massachusetts Boston

### Abstract

Early mobilization of intensive care patients has gained the interest of researchers within the last few years due to its safe and practical application and numerous benefits it can provide.

Reviewing the literature on this topic reveals the substantial benefits of early mobilization and the detrimental effects of prolonged bedrest. Despite recent evidence proving that this practice will increase quality of care, many intensive care units still utilize bedrest as a standard.

Understanding the barriers and facilitators of this change can help transform this research into practice and improve patient care outcomes. Nurses are the key facilitators in the initiative to mobilize patients and must be educated on the evidence behind this practice. With interdisciplinary teamwork and collaboration, this intervention can become a new standard in intensive care units throughout the country.

## Improving Patient Outcomes: Early Mobilization of Intensive Care Patients

### **Introduction on Early Mobilization**

The critical condition of patients in intensive care units requires nursing priorities to center on short-term goals, such as maintaining hemodynamic stability and respiratory function. Patients on these units can be sedated, mechanically ventilated, and requiring multiple central access and monitoring lines. Although mobilizing hospitalized patients to improve outcomes is a historical precedent, critically ill patients often remain on complete bedrest for prolonged periods of time (Hashem et al, 2016). The process of mobilizing critically ill patients requires time, planning, and effective interdisciplinary communication to achieve beneficial outcomes. In their systematic review of the literature on early mobilization, Alder & Malone (2012) reported that early mobilization is only a common practice in a small percentage of intensive care units in the United States. The body of literature on the benefits, safety, and feasibility of early mobilization in critically ill patients has grown substantially in recent years (Hashem et al, 2016) and the gap between research and practice is decreasing. Because nurses are at the forefront of these initiatives, it is crucial that they fully understand the evidence behind early mobilization and the strategies to overcome barriers during the implementation process. Not only is early mobilization of intensive care patients safe and feasible, it creates short-term and long-term benefits for the patient.

In the nursing community, the detrimental effects of prolonged bedrest are well-known and nurses coordinate interventions to alleviate these effects. Some of the negative impacts of bedrest include the following: risk for ventilator-associated pneumonia, risk of pressure ulcer development, increased incidence of delirium, increased length of hospital stay, and need for

prolonged ventilation (Freeman & Maley, 2013). Specifically in intensive care units, where prolonged bed rest is common, ICU-acquired neuromuscular weakness has gained increased attention in the medical community. The etiology of neuromuscular weakness can be attributed to the critical illness itself, medications used for sedation, and protracted periods of immobility. In a meta-analysis of twenty-four studies that followed intensive care patients with multiple conditions, both with and without mechanical ventilation, 46% of patients were diagnosed with neuromuscular dysfunction by physical examination (Needham, 2008). Neuromuscular dysfunction is often a late diagnosis following weeks of prolonged bedrest and muscle atrophy. Most clinicians cannot observe the full extent of the weakness until the patient is discharged home and recognizes their impaired functioning in performing normal physical activities. ICU-acquired neuromuscular weakness is diffuse and results in limited mobility and occasionally respiratory compromise. Of the potential causes of neuromuscular weakness in intensive care patients, “early mobilization may most directly modify the negative effects of bedrest” (Needham, 2008).

The benefits of early mobilization of intensive care patients is a topic that has been studied increasingly as more and more units adopt this change. In a recent issue of the *Journal of Intensive Care Medicine*, Denehy et al (2016) lists the reasons why patients should be mobilized early under the heading: “What’s New in Intensive Care”. Some of the reasons include: attenuating complications of bedrest, addressing the sequelae of ICU-acquired weakness, promoting reduction of sedation, and improving delirium (Denehy et al, 2016). Many recent studies, including a retrospective observational study by Lai et al (2016), found that early mobilization significantly decreased the length of stay in the intensive care unit and the duration of mechanical ventilation. Despite all of the proven benefits of early mobilization, complete

bedrest continues to be the standard among intensive care units in the United States. In fact, a survey of multiple intensive care units revealed that patients' participation in activities other than bedrest accounted for only 11% of their time in the intensive care units (Engel et al, 2013). In order to transform research into practice there are many barriers to early mobilization that must first be addressed.

Nurses must be proficient in the QSEN competencies of evidence-based practice and teamwork and collaboration in order to facilitate the change to early mobilization in their own work environment. By utilizing the steps of evidence-based practice, the following PICO question was formulated to guide the research process: Among patients in intensive care units, how is early mobilization more beneficial to patient outcomes compared to complete bedrest? This research involved finding high-level evidence that supported the change to early mobilization in intensive care units. After the evidence is appraised, interventions can only be implemented through the use of teamwork and collaboration, which is a key nursing competency. The goals of the research on early mobilization were to fully understand the benefits of early mobilization and the perceived barriers to successfully implementing this change. Early mobilization can be initiated when nurses collaborate with other members of the interdisciplinary team to make this intervention a priority in patients' care plans.

### **Review of the Literature**

#### **A.) Patient Problem**

The key patient problem identified through the PICO question involves the nursing diagnosis of Impaired Physical Mobility and its associated complications. Patients remain on bedrest in the ICU for a multitude of reasons including: sedation, high doses of vasopressors, catheters that contraindicate limb movement, and mechanical ventilation. One of the common

concerns of nurses when planning to mobilize critically ill patients is the safety and the feasibility of this intervention. On other units, transferring a patient into a chair may require more than one nurse or nurse's aid, but rarely does it involve an entire team. Mobilizing critically ill patients involves careful evaluation of the patient and planning with the entire interdisciplinary team, especially physical and occupational therapists. The beginning of the research process involved locating original research on the safety and feasibility of this intervention.

A prospective observational study was conducted in a 14-bed medical ICU by Bourdin et al (2010) in order to evaluate the feasibility and effects of an early mobilization program on patients' physiologic status. This early mobilization program was implemented on this unit on the basis of previous evidence that proved early mobilization increases mechanical ventilation weaning success rates, decreases hospital stay length, and improves overall quality of life after discharge from the intensive care unit (Bourdin et al, 2010). This study focused on mechanically ventilated patients only and it was a requirement to be included, along with a minimum length of stay of seven days. A rehabilitation protocol was created, which defined criteria for the type and duration of the mobilization, including chair-sitting, tilting upwards, and walking. It is important to note that the final decision about patient eligibility in this program was determined by the physician and physical therapist and re-evaluated each day. There were certain contraindications for early mobilization in this program, including not being able to follow simple commands, low systolic blood pressure requiring multiple vasopressors, increased respiratory rate above 35 breaths per minute, ongoing intravenous sedation, and renal replacement therapy (Bourdin et al, 2010). This mobilization program required the unit to hire a dedicated physical therapist to implement the interventions with staff nurses. At the end of the five month study, 424

interventions were performed on 20 mechanically ventilated patients. Adverse events were recorded in 15 interventions (3% of the interventions). These events were transient and most often involved changes in blood pressure and never involved patient falls. Because of the low rate of adverse events, there was not enough data to determine if a single intervention had more risk than another. The study concluded that early rehabilitation of intensive care patients is both feasible and safe when a protocol is created and patients are evaluated before each session.

The results of the Bourdin et al (2010) study facilitate the implementation of early mobilization programs in intensive care units because they confirm that this type of program is both practical, beneficial, and most importantly, safe for patients. Although this is a level IV evidence study, the cohort size was small due to the short duration of the study and the fact that only intubated patients were involved. Another limitation is the absence of a control group, but the purpose of this study did not require a control group because it was to investigate the safety of the intervention itself. An important strength in the study is that it clearly defined contraindications for the early mobilization program and barriers to overcome certain contraindications, which could be helpful when creating future protocols for early rehabilitation programs in intensive care units. After determining that early mobilization of critically ill patients can be achieved and it is safe, the next step in the research process is to appraise studies that use control groups to determine the effectiveness of this intervention.

### **B.) Nursing Intervention**

A case-control study by Corcoran et al (2017) sought to determine the effectiveness of early mobilization programs in intensive care units by determining its effect on patient outcomes, length of stay, and hospital finances. This study was conducted in the medical and surgical intensive care units of a level two trauma hospital. It involved prospective data collection of a



group of ICU patients pre-implementation and a separate group of ICU patients post-implementation of the Performance Improvement Project (PIP). Overall, 160 patients met the inclusion criteria for the pre-implementation group and 123 patients met the criteria for the post-implementation group. The PIP involved an increase in rehabilitation therapy services from 2012 to 2014 by 60 minutes per patient per day. These mobility sessions involved physical therapists, occupation therapists, and registered nurses. Three levels of mobility were studied: in-bed exercises only, standing, and ambulating in the hall.

This study is valid because categorical data from the control group and the PIP group were compared and significance levels were reported with exact statistics (Corcoran et al, 2017). The findings involved changes in sedative usage, length of stay, ambulation at discharge, discharge destinations, and hospital costs. The reduction in length of stay was statistically significant with the pre-PIP group staying an average of 3.2 days longer than the PIP group (Corcoran et al, 2017). Medication usage, particularly the use of benzodiazepines, decreased significantly in the PIP group. There was also a difference in discharge destinations with 40.5% of the patients in the PIP group discharged to home without services compared to only 18.2% of the pre-PIP group. This study was one of the few studies on early mobilization that evaluated the effects on hospital cost in detail. Even with the increased staffing cost necessary to implement such an involved mobilization program (\$655,000), the net savings cost was still \$1.5 million (Corcoran et al, 2017). This study provides significant evidence for the benefits of mobilizing patients in intensive care, but it does have limitations. Because it is a retrospective studies, certain variables could not be controlled in the pre-PIP group which could have had an effect on the data. This study is unique in that it analyzes data from all types of patients in intensive care units and not specifically patients who are mechanically ventilated. The findings provide

statistical evidence that this nursing-related intervention can reduce complications of impaired physical mobility in critical care settings and provide cost savings for the hospitals funding these programs.

Clark et al (2012) conducted a retrospective cohort study which also analyzed the effects of an early mobilization protocol. Although this study was focused in a specific type of intensive care unit, a trauma and burn unit, its objective was similar to that of other studies involving different types of intensive units. The objective of this study was to determine the effects of an early mobility protocol on patient complication rates, ventilator days, and hospital length of stay (Clark et al 2012). This retrospective cohort study analyzed patient data before and after the implementation of an interdisciplinary quality improvement program involving early mobilization. This study had a large sample size of 2,176 patients which makes the results data more inclusive of larger patient populations. In the introduction, this study noted that the standard of the unit prior to the implementation of this program was strict bedrest. An important step in initiating the program including changing the standard activity order from “bedrest” to “activity as tolerated” (Clark et al, 2012). This study went into great detail about the actual development of the protocol, which involved detailed inclusion criteria for certain types of mobility exercises and specific mobilization techniques that could only be done in the presence of a physical therapist. Like the previous study discussed, an additional full-time therapist was hired to meet the increased demand on the unit. The nursing and physical therapy managers conducted interprofessional education sessions before implementation of the protocol. An interesting aspect of the new protocol involved morning rounds with the registered nurse and physical therapist to ensure collaborative teamwork. The planning of the new protocol was

discussed in great detail within the study and can be a great resource for critical nurses wanting to implement early mobilization on their own units.

The findings of the Clark et al (2012) study were consistent with the findings from the previous study discussed with a few additional positive outcomes. The limitations were also related to the uncontrolled variables in the pre-implementation group. The study determined early mobilization to be safe as evidenced by mortality rates, adverse events, and discontinuation in therapy sessions due to patient responses (Clark et al, 2012). The reduction in airway, pulmonary, and vascular complications were the highlight of the findings. The early mobility program significantly reduced certain complications such as re-intubation rates, pneumonia, pneumothorax, and DVT (Clark et al, 2012). Although not a quantitative outcome, the early mobility program transformed the unit's approach to patient-centered care. "Delivery of care was transformed from a multidisciplinary approach in which each discipline operated parallel to an interdisciplinary approach where collaboration, communication, and problem-solving occurred beyond the confines of individual disciplines" (Clark et al, 2012). This study provided quantitative evidence of the benefits of early mobilization while explaining how these programs are not possible without collaboration and teamwork.

There is a considerable amount of quantitative evidence in the literature on early mobilization of intensive care patients, but recently qualitative studies have revealed nurses perceptions on this shift in practice. Specifically, a qualitative study conducted by Barber et al (2015) aimed to identify the perceived barriers nurses associate with early mobilization in intensive care settings. Barber et al (2015) confirmed that it is "well established that mobilizing critically ill patients has many benefits, however it is not occurring as frequently as expected". Identifying the barriers and facilitators to early mobilization in intensive care units can help to

translate research into practice. This study is level VI evidence because it is a qualitative descriptive study involving nursing, physician, and physical therapy focus groups. This study involved purposeful sampling of healthcare professionals by a clinical researcher in one medical intensive care unit. A total of 25 intensive care clinicians were included in the study with a total of three focus groups for each discipline. A clear limitation of this study is that it is a one-center study involving experiences and perceptions rather than quantifiable data, but the results of the study are necessary to create successful early mobilization programs in the future.

The three major themes associated with barriers to implementing an early mobilization program include the culture of the intensive care unit, communication, and lack of resources. An interesting finding is that all of the clinicians understood that having an endotracheal tube did not contraindicate mobilization, but most clinicians still perceived this a safety barrier (Barber et al, 2015). This can be closely associated with the culture of the unit and what the unit believes to be acceptable practice despite recent evidence. Another unit culture barrier was described as “the culture of the way we use sedation” (Barber et al, 2015). Nurses in the focus group who had practiced longer identified that intensive care units utilize IV sedation more frequently than they did years ago, which is a contraindication to ambulation. Two of the focus groups, nurses and physicians, noted that mobility “is prioritized lower than perhaps other things” (Barber et al, 2015). Communication was a key theme between all focus groups and it was described as a major barrier to actually implementing the planned intervention. One nurse said, “I know I have asked to mobilize a patient and others have as well and it doesn’t actually happen. It’s about finding the right people and getting the right orders to safely mobilize a patient” (Barber et al, 2015). The last major barrier was a lack of resources. All focus groups agreed that the lack of available physical therapists in intensive care units made it difficult to safely mobilize patients

(Barber et al, 2015). A lack of equipment was also noted frequently in this discussion of resources. If barriers are acknowledged and modified, early mobilization programs may become more common in actual practice.

In addition to discussing the barriers in focus groups, the groups also discussed what factors may facilitate the initiation of successful early mobilization programs. The key facilitators were organizational change, leadership, and sufficient resources (Barber et al, 2015). All groups identified that making early mobility a standard of care on the unit would facilitate these changes, along with the creation of a dedicated interprofessional “mobility team” (Barber et al, 2015). Strong leadership that role-models this new standard of care is also essential to successful implementation. Lack of resources or adequate resources can make a significant impact on early mobilization. The nursing and physical therapist focus groups mentioned that “with enough training and people, mobilizing critical patients would not seem so daunting” (Barber et al, 2015). This study can enlighten organizations on the key elements necessary to implement this important change and the resources needed to ensure its continued success.

Another important study to appraise is the one conducted by Messer et al (2015), which focuses on the specific nursing implications of implementing a mobilization program in an intensive care unit. The objective of this study was to evaluate the effect of education for an early mobilization program for intensive care nurses on the basis of knowledge and performance (Messer et al, 2015). This study compared the pre-test and post-test scores of 41 intensive care nurses after receiving education through various methods on the implementation of early mobilization. This study also examined patient mobility rates before nurses completed educational sessions and after nurses completed these sessions. Complete literature reviews were conducted prior to creating the education sessions. This study is limited because of the small

sample size, but variables are controlled and adjusted for from the pre-education phase to the post-education phase (Messer et al, 2015).

The findings of this study revealed the importance of conducting educational sessions for nurses prior to implementing a mobilization program in an intensive care unit. Although nurses are trained in safe ambulation and transferring, the complexity of critical care patients requires specific training in order to mobilize patients safely and collaborate with other members of the team. The study concluded that mobilization education was effective and increased nurses' knowledge about the benefits of early mobilization (Messer et al, 2015). The educational program also affected how nurses performed mobility interventions (Messer et al, 2015). There was a significant increase in the number of mobility events, such as dangling and transferring patients to a chair, after the educational sessions. This study went into detail about the educational sessions, which included a collaboration between the nurse educator and the physical therapist educator, visual demonstrations, and hands-on practice. This study showed how embracing evidence-based practice through education can positively impact the implementation of that practice on the units.

The literature appraised included different levels of evidence and design methods, but all concluded that early mobilization of intensive care patients is safe, feasible, and provides numerous benefits for the patient and the healthcare organization implementing it. A common theme mentioned throughout the literature involves a gap between research findings and actual practice on intensive care units. Qualitative research helps to define these barriers preventing the implementation phase of evidence-based practice. In order to further evaluate both nursing staff and patient responses to the initiation of an early mobilization program in the intensive care setting, case studies should be followed and analyzed.

### **Early Mobilization Case Study**

This particular case study takes place in a surgical cardiovascular intensive care unit where an early mobilization program had been implemented within the last month. Many of the nurses on this unit are early adopters and are often receptive to change with proper planning, training, and ongoing education. Important nursing competencies involved in this change were the use of evidence-based practice and effective teamwork and collaboration. The nurses on this unit value the concept of evidence-based practice and continually integrate it into their clinical work. This can be seen with the “Journal Club” held each month by the nurse leader on the unit. Once a month, nurses can gather outside of work to share articles from critical care journals that they find relevant to the patient population on their unit. After determining that the recent evidence shows early mobilization in intensive care units to be the best clinical practice, the nurse manager and nurse educator began to develop their own early mobilization protocol based on the current research. The nurse leaders could not create this protocol on their own, so they created an interdisciplinary team with cardiac residents and physical therapists to create a successful mobilization strategy.

One of the most important aspects of adopting this protocol into practice was to change the culture of the cardiac intensive care unit. Lack of mobility culture, defined by Dubb et al (2016) as inadequate staff buy-in and lack of multidisciplinary culture, must first be addressed before attempting to implement the change. The first step in overcoming this barrier was offering multi-professional education sessions on the benefits of early mobilization and the strategies to overcome barriers of implementation. Structural barriers must then be identified such as, limited staff and limited equipment. Before the mobilization protocol was implemented, one physical therapist and one additional nursing assistant were hired on the unit and trained in the new

protocol. During a staff meeting, nurses voiced concerns about patient-related barriers such as hemodynamic instability and hemodynamic monitoring equipment. They were assured that the protocol included strict inclusion criteria which contraindicated mobilization strategies for specific conditions and physiologic states. Additionally, the unit physical therapist would be included in the daily morning rounds to re-evaluate each patient's eligibility for the mobilization protocol.

The early mobilization protocol was clearly defined as a stepwise implementation of exercises and activities starting on admission and advancing throughout the hospital stay. Activities began with simple turning, passive range of motion, and elevating the head of the bed. As indicated by the multidisciplinary team, the activities progressed to dangling at the bedside and transferring from the bed to the chair. Further progression involves ambulation at the bedside, ambulation in the hallway, and stair climbing. Physical therapists, nurses, and occupational therapists are required to work together to implement these activities and also provide specific strength training exercises based on the patient's needs. These activities, unless specifically contraindicated, can begin regardless if the patient is on mechanical ventilatory support or requires a vasopressor for hemodynamic support (Freeman & Maley, 2013). Unfortunately, there is a gap in the literature regarding how and when patients should be mobilized after cardiac surgery with circulatory support devices (Freeman & Maley, 2013). This unit in particular has many patients with arterial lines, pulmonary artery catheters, and circulatory support devices such as, Impellas, Intra-Aortic Balloon pumps, and Total Artificial Hearts. Although patients with such devices may have stricter activity guidelines based on the unit protocol, the early mobilization program should still be implemented. The patient in this



case study requires mechanical circulatory support and has benefited significantly from the early mobilization program, even though modifications had to be made.

Mr. B. is a 48 year-old male who has been in the cardiac intensive care units multiple times for complications from congenital cardiac defects. Currently, he has been on the unit for two days after the placement of an Intra-Aortic Balloon Pump (IABP) in response to acute mitral valve regurgitation. The IABP is a catheter with a slender balloon that is inserted through the femoral artery and advanced into the aorta. At certain points in the cardiac cycle, the balloon inflates leading to increased perfusion. This device is used for acute stabilization and is only intended to be in place for hours or days. Although studies have shown that patients with femoral artery catheters for monitoring can still participate in early mobility programs without functional damage to the catheter, patients with IABP's require the catheter to be stabilized at all times (Perme et al, 2011). The nurse for Mr. B. understands that mobility will be limited due to the IABP and his acute hemodynamic instability. Currently, he is on multiple vasopressors, which the nurse knows is a direct contraindication for certain types of activity based on the mobility protocol. Certain activities, like sitting on the edge of the bed, could cause displacement of the device and detrimental outcomes for the patient. During morning rounds, the nurse consults with the interdisciplinary team about the early mobility options for Mr. B. Because the patient has an IABP and has a very low systolic blood pressure, the team knows that activity beyond bedrest is not practical for this patient. The nurse reviews the mobility protocol for patients with these devices and discovers that Mr. B can still participate in active range of motion of the extremities (avoiding the extremity where the device is located) when he is able to follow commands. This is an integral part of Mr. B's plan of care and the nurse involves Mr. B's wife when implementing the mobility intervention.

In the next two days, Mr. B undergoes cardiac surgery for a centrally implanted mechanical circulatory support device known as the HeartMate II. This is a chronic left ventricular assistive device which will help Mr. B in the transition to his eventual heart transplant. Mr. B has been in the process of transitioning from acute illness to chronic illness. Although he has lived with a minor congenital heart defect, he has been functionally independent for the majority of his life. This transition is difficult for both Mr. B and his wife, and the nurse understands that the properties of transitions must be addressed. Mr. B is already aware of his condition, but the next step in the transition process is engagement. The nurse evaluates the facilitators and inhibitors of his transition and identifies “health perceptions” as a key facilitator and “knowledge” as a major inhibitor. The nurse incorporates education about the HeartMate II device and acceptable level of activity with this type of device into the plan of care. Because this is a centrally implanted device, progressive mobility is achievable without the restrictions imposed by the location of a femoral catheter. The nurse recognizes that the benefits from the early mobilization protocol will help Mr. B in his transition to chronic illness. By facilitating early mobilization, the nurse will decrease the complications from immobility that may have occurred with complete bedrest and resulted in a longer ICU stay and lower quality of life for Mr. B.

During morning rounds the nurse and physical therapist collaborate on a mobility plan for Mr. B. following the unit’s protocol for the HeartMate II device. The length of time post-operatively is a key factor in what level of activity Mr. B. can withstand. The physical therapist notes that Mr. B is one day post-implant from a closed chest procedure, which means that he can dangle his feet at the bedside and transfer to the chair if feasible. The nurse explains to the physical therapist that Mr. B is now hemodynamically stable and his head-to-toe assessment

revealed adequate strength in the bicep muscles in order to dangle his legs on the edge of the bed. After confirming that Mr. B. has an abdominal binder in place to secure his device controller, the team is ready to begin the mobilization protocol. With the help of the trained nurse's aid, the nurse and the physical therapist assist Mr. B in sitting up and dangling his feet over the side of the bed. Mr. B. responds well to the intervention and his wife tells the nurse that it is good to see him look "normal" again after a week of bedrest. The next day, Mr. B. is able to transfer to the chair and the nurse notices a drastic change in his mood from this simple intervention. Mr. B. says he looks forward to the upcoming days when he can begin to walk again.

Although this early mobilization program required extensive planning and interdisciplinary teamwork and collaboration, it has allowed Mr. B. to adapt to his chronic condition by retaining some of his premorbid functional independence. Without the early mobilization program, Mr. B. may have been on complete bedrest during his stay in the intensive care unit. The complications from prolonged bedrest are numerous and may have resulted in serious neuromuscular complications after being discharged from the intensive care unit. The nurse taking care of Mr. B. explains how even the smallest of mobility interventions, like active range of motion exercises when Mr. B. had an IABP, improved the patient's outcome. After discharge, Mr. B. should continue to be followed by the team to evaluate if any complications, such as ICU-acquired weakness, arise. The nurses on the unit have agreed that this change has brought about a change in the entire culture of their unit. The staff appreciate the interdisciplinary approach required for the successful change in practice and they now view early mobility as a priority in the plan of care. This case study exhibits the entire process of

incorporating early mobilization into such a critical environment and how it is possible with the right resources and nursing leadership.

### **Future Implications of Early Mobilization**

Although numerous factors affecting patients in intensive care units can cause weakness and disability post-discharge, one of the most detrimental is prolonged bedrest (Engel et al, 2013). In the literature review, numerous benefits were discovered from the studies when early mobilization was implemented in some form. Decreased length of hospital stay, decreased length of mechanical ventilation, decreased need for rehabilitation services after discharge, and increased functional independence after discharge were just some of the many positive outcomes that were discovered. But despite the well-known harmful effects of prolonged bedrest and the research supporting early mobilization of intensive care patients, this practice is still uncommon, especially with mechanically ventilated patients (Hashem et al, 2016).

An obvious barrier to the implementation of these programs is a lack of resources. A study evaluating early mobilization practices in intensive care units across the United States concluded that 34% of the units have a dedicated physical therapist and 30% have a written protocol for early mobilization (Bakhru et al, 2015). With a lack of resources, it is nearly impossible to mobilize critically ill patients who require thorough evaluation and planning before implementing any type of activity. Identifying the local barriers to implementing an early mobilization program is a critical step in the Translating Research into Practice Model (Pronovost et al, 2008). Other steps within this model include: summarizing the evidence to understand the highest-yield interventions, engaging stakeholders, educating the stakeholders, and evaluating the intervention (Pronovost et al, 2008). Closing the gap between research and practice will only be possible through the use of structured quality improvement projects

involving all interdisciplinary team members. Nurses remain a vital element of this interdisciplinary team and must be fully engaged in the planning of early mobilization programs in order for them to be successful.

The future of early mobilization is promising as more research is conducted and the evidence expands. Initiating early mobilization has become a popular quality improvement project among intensive care units throughout the country (Hashem et al, 2016). A number of new technologies are being evaluated to assist with early mobilization such as neuromuscular electrical stimulation and cycle ergometry. Increasing availability of these technologies will provide more resources to the interdisciplinary teams working towards implementing this evidence-based practice. Some questions for future research in this field include: (1) What intensity and frequency of physical activity will yield the best patient outcomes? (2) Are there patient populations who would benefit most from early mobilization in the intensive care units? (3) Are there populations of patients in intensive care for whom this intervention will always be contraindicated? (Adler & Malone, 2012).

Although mobilizing patients is a common practice in the hospital setting, the critical nature of the patients in intensive care units makes this intervention more demanding. Interdisciplinary collaboration and repetitive education and training on the benefits of early mobilization will transform the culture of the unit and make this intervention a new priority for quality patient care. According to the QSEN competencies, nurses are proficient in both evidence-based practice and teamwork and collaboration and, therefore, are the driving force of these initiatives. The inherent nature of the nursing practice compels the use of early mobilization due to its positive effect on quality patient-centered care. With the proper resources,

leadership, communication, and culture, intensive care units can embrace this change and improve the quality of the diligent care they provide every day.

## References

- Adler, J., & Malone, D. (2012 ). Early mobilization in the intensive care unit: A systematic review. *Cardiopulmonary Physical Therapy Journal*, 23, 5-13.
- Bakhru, R. N., Wiebe, D. J., McWilliams, D. J., Spuhler, V. J., & Schweickert, W. D. (2015). An environmental scan for early mobilization practices in U.S. ICUs. *Critical Care Medicine*, 43(11), 2360-2369. doi:10.1097/ccm.0000000000001262
- Barber, E. A., Everard, T., Holland, A. E., Tipping, C., Bradley, S. J., & Hodgson, C. L. (2015). Barriers and facilitators to early mobilization in intensive care: A qualitative study. *Australian Critical Care*, 28(4), 177-182. doi:10.1016/j.aucc.2014.11.001
- Bourdin, G., Barbier, J., Burle, J., Durante, G., Passant, S., & Vincent, B. (2010). The feasibility of early physical activity in intensive care unit patients: A prospective observational one-center study. *Respiratory Care*.
- Castro, E., Turcinovic, M., Platz, J., & Law, I. (2015). Early mobilization: Changing the mindset. *Critical Care Nurse*, 35(4). doi:10.4037/ccn2015512
- Clark, D. E., Lowman, J. D., Griffin, R. L., Matthews, H. M., & Reiff, D. A. (2012). Effectiveness of an early mobilization protocol in a trauma and burns intensive care unit: A Retrospective Cohort Study. *Physical Therapy*, 93(2), 186-196. doi:10.2522/ptj.20110417
- Corcoran, J., Herdsman, J., & Bushnik, T. (2017 ). Early rehabilitation in the medical and surgical intensive care units for patients with and without mechanical ventilation: An interprofessional performance improvement project. *Physical Medicine and Rehabilitation*, 3, 113-119.

- Denehy, L., Lanphere, J., & Needham, D. M. (2016). Ten reasons why ICU patients should be mobilized early. *Intensive Care Medicine*, 43(1), 86-90. doi:10.1007/s00134-016-4513-2
- Dubb, R., Nydahl, P., Hermes, C., Schwabbauer, N., Toonstra, A., Parker, A. M., . . . Needham, D. M. (2016). Barriers and strategies for early mobilization of patients in intensive care units. *Annals of the American Thoracic Society*, 13(5), 724-730.  
doi:10.1513/annalsats.201509-586cme
- Engel, H. J., Tatebe, S., Alonzo, P. B., Mustille, R. L., & Rivera, M. J. (2013). Physical therapist-established intensive care unit early mobilization program: Quality improvement project for critical care at the University of California San Francisco Medical Center. *Physical Therapy*, 93(7), 975-985. doi:10.2522/ptj.20110420
- Freeman, R., & Maley, K. (2013). Mobilization of intensive care cardiac surgery patients on mechanical circulatory support. *Critical Care Nursing Quarterly*, 36(1), 73-88
- Hashem, M., Nelliott, A., & Needham, D. (2016). Early mobilization and rehabilitation in the ICU: Moving back to the future. *Respiratory Care Journal*, 61(7), 971-979.  
<http://dx.doi.org.ezproxy.lib.umb.edu/10.4187/respcare.04741>
- Lai, C., Chou, W., Chan, K., Cheng, K., Yuan, K., Chao, C., & Chen, C. (2016). Early mobilization reduces duration of mechanical ventilation and intensive care unit stay in patients with acute respiratory failure. *Archives of Physical Medicine and Rehabilitation*.  
doi:10.1016/j.apmr.2016.11.007
- Messer, A., Comer, L., & Forst, S. (2015). Implementation of a progressive mobilization program in a medical-surgical intensive care unit. *Critical Care Nurse*, 35(5), 28-42.  
doi:10.4037/ccn2015469



Needham, D. M. (2008). Mobilizing patients in the intensive care unit. *JAMA*, 300(14), 1685.

doi:10.1001/jama.300.14.1685

Perme, C., Lettvin, C., Throckmorton, T. A., Mitchell, K., & Masud, F. (2011). Early mobility and walking for patients with femoral arterial catheters in intensive care unit: a case series. *Journal of Acute Care Physical Therapy*, 2(1), 30-34. doi:10.1097/01592394-201102010-00004

Pronovost, P. J., Berenholtz, S. M., & Needham, D. M. (2008). Translating evidence into practice: A model for large scale knowledge translation. *BMJ*, 337.

doi:10.1136/bmj.a1714