THE EFFECTIVENESS OF A NURSE-DRIVEN PROGRESSIVE MOBILITY PROTOCOL ON REDUCING LENGTH OF STAY IN THE ADULT INTENSIVE CARE UNIT

by

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# Table of Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHAPTER ONE:</strong> Overview of the Problem</td>
<td>4</td>
</tr>
<tr>
<td>Background Information</td>
<td>4</td>
</tr>
<tr>
<td>Current Mobility Practices</td>
<td>5</td>
</tr>
<tr>
<td>Significance of the Problem</td>
<td>5</td>
</tr>
<tr>
<td>Question Guiding Inquiry (PICO)</td>
<td>6</td>
</tr>
<tr>
<td>Conclusion</td>
<td>7</td>
</tr>
<tr>
<td><strong>CHAPTER TWO:</strong> Review of the Literature</td>
<td>8</td>
</tr>
<tr>
<td>Methodology</td>
<td>8</td>
</tr>
<tr>
<td>Critical Appraisal of the Evidence</td>
<td>9</td>
</tr>
<tr>
<td>Conclusion</td>
<td>12</td>
</tr>
<tr>
<td><strong>CHAPTER THREE:</strong> Conceptual Model for the Evidence-based Practice Change</td>
<td>14</td>
</tr>
<tr>
<td>Stetler Model in Evidence-based Practice</td>
<td>14</td>
</tr>
<tr>
<td>Conclusion</td>
<td>15</td>
</tr>
<tr>
<td><strong>CHAPTER FOUR:</strong> Project Design</td>
<td>16</td>
</tr>
<tr>
<td>Development of a Progressive Mobility Protocol</td>
<td>16</td>
</tr>
<tr>
<td>Description of the Progressive Mobility Protocol</td>
<td>17</td>
</tr>
<tr>
<td>Plan to Roll out the Protocol to ICU</td>
<td>19</td>
</tr>
<tr>
<td>Project Outcome</td>
<td>20</td>
</tr>
<tr>
<td>Conclusion</td>
<td>20</td>
</tr>
<tr>
<td><strong>CHAPTER FIVE:</strong> Implementation Procedure and Process</td>
<td>22</td>
</tr>
<tr>
<td>Evidenced-based Project Vision</td>
<td>22</td>
</tr>
<tr>
<td>Project Implementation Activities</td>
<td>23</td>
</tr>
</tbody>
</table>
# Progressive Mobility

## Conclusion

### CHAPTER SIX: Evaluation and Outcomes

- Intended Outcome
- Measurement of Length of Stay
- Effectiveness of the Nurse-driven Progressive Mobility Protocol

### Conclusion

### CHAPTER SEVEN: Implications for Nursing Practice

- Implications to Nursing
- Scientific Underpinnings for Practice.
- Organizational and Systems Leadership for
- Quality Improvement and Systems Thinking.
- Clinical Scholarship and Analytical Methods for Evidence-Based Practice.
- Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care
- Health Care Policy for Advocacy in Health Care
- Inter-professional Collaboration for Improving Patient and Population Health Outcomes
- Clinical Prevention and Population Health for Improving the Nation’s Health.
- Advanced Nursing Practice.
- Limitations of the Project

### Conclusion

### CHAPTER EIGHT: Conclusion

### REFERENCES

### APPENDIX A

### APPENDIX B
Chapter One: Overview of the Problem

Critically ill patients become deconditioned easily when placed on bedrest. Deconditioning includes loss of muscle mass and strength. Nursing staff are continually challenged to obtain the resources needed to get patients out-of-bed, only to face the reality that many patients will need to be returned to bed within a very short period of time. A standardized approach to mobilizing critically ill patients is needed to improve patient outcomes and the quality of care in intensive care units (ICU) across the country. The development of a progressive mobility protocol to decrease the time critically ill patients spend in the hospital is the basis of this evidenced-based practice (EBP) project. This chapter presents an overview of the problem, significance, and the question guiding inquiry related to an EBP project focusing on progressive mobility.

Background Information

Critically ill patients are routinely subjected to long periods of immobility, which often results in prolonged intubation and increased length of stay (LOS) in the ICU. Bedrest for the critical care patient can lead to complications such as pneumonia, pulmonary embolism, dampened carotid baroreceptor response, pressure ulcers, muscle atrophy, and joint contractures, all of which can lead to an increased LOS in the ICU (De Jonghe, Bastuji-Garin, Sharshar, Outin, & Brochard, 2004; Morris, & Herridge, 2007; Rauen, Chulay, Bridges, Vollman, & Arbour, 2008). The barriers and resistance to mobilizing the critically ill patient are present in nearly every ICU in the country. The additional staff needed to safely get patients out-of-bed is often overwhelming. In addition, the ICU patient often decompensates easily when transferred out-of-bed, resulting in short durations of time spent out-of-bed. The decompensation often includes an increase in heart rate and respiratory rate, as well as a decrease in blood pressure, and blood
oxygenation. This decompensation leads to frustration on the part of staff, further discouraging future mobilization attempts.

The purpose of the nurse-driven progressive mobility protocol is to allow for the safe progression of mobility in the critically ill patients. Increased mobility can decrease complications and reduce LOS in the ICU. The EBP protocol will provide a framework for progressing patients toward an up-right, out-of-bed position, following a series of defined positions.

*Current mobility practices*

Current practice often involves manual repositioning every 2 hours with patients getting out-of-bed only after removal of treatment related devices including ventilators. In order to successfully mobilize the patient, it is often necessary to elicit the help of several nursing staff members. Patients are typically very weak and have very poor response to getting out-of-bed, resulting in a very short duration of time out-of-bed. The patients decompensate easily requiring transfer back to bed with the assistance of multiple nursing staff. When the patient response to attempted mobilization is poor, staff deems it necessary to allow the patient to rest and do not attempt mobilization again until the next day.

*Significance of the Problem*

Current practice often involves manual repositioning every 2 hours, which has been regarded as the standard of care (Goldhill, Imhoff, McLean, & Waldmann, 2007). Physician’s perception is that critically ill patients are repositioned every 2 hours. Direct observation indicates this is not common practice (Krishnagopalan, Johnson, Low, & Kaufman, 2002). The alarming incidence of prolonged bedrest in the critically ill gives validity to the need for a standardized approach to mobility. A written protocol for mobility would give the nurse the tools
and the order to mobilize their patients, just as the physicians already believed they were (Krishnagopalan et al.).

**Question Guiding Inquiry (PICO)**

Formulation of a clinical question is needed to provide focus for the inquiry into the literature. The clinical question provides the framework for searching and interpreting the evidence. The PICO method is a standardized method to formulate the question. The PICO method must include (P) patient population, (I) intervention of interest, (C) comparison intervention or status, and (O) outcome (Melynk & Fineout-Overholt, 2005). The clinical question that served as the foundation for this evidenced-based practice project was: For immobile critical care patients does the use of a nurse-driven progressive mobility protocol reduce ICU LOS compared to every 2 hour repositioning?

The Population (P) of interest is adult patients admitted to a critical care unit. Adult is defined as 18 years of age or older. The Intervention (I) is a nurse-driven progressive mobility protocol. The protocol will be a standing order set in the ICU and will be implemented on all patients, 24 hours after admission to the ICU. The nurse-driven progressive mobility protocol will transition patients from in bed with the head of the bed elevated at 30 degrees to a fully upright out-of-bed position following a series of steps. Patients are screened every 8 hours for absolute contraindications which include unstable fractures, comfort care, respiratory of cardiovascular instability, unstable neurologic function with draining intracranial pressure monitoring, and the presence of femoral sheaths. If no contraindications are present, the patient will be mobilized based on the step of the protocol they currently tolerated the prior shift.

The Comparison (C) is adult critical care patients who are repositioned every 2 hours in bed. Repositioning every 2 hours is currently the standard of care in the ICU and is a standing
order in the ICU. The Outcome (O) is a decrease in LOS. Reduction in the LOS in the hospital and ICU will decrease hospital cost and reduce the potential for hospital acquired complications such as pneumonia, pressure ulcers and muscle atrophy. The current average total LOS for patients with an ICU stay is 13.49 days. This LOS was reflective of the 12 month period prior to implementation of the protocol.

Conclusion

The purpose of this evidenced based practice project was to develop and implement a nurse-driven progressive mobility protocol to decrease LOS in the ICU. The need for a standardized approach to mobilizing critically ill patients in a manner that promotes health and stability is necessary to improve care outcomes. The use of a nurse-driven progressive mobility protocol has the ability to decrease LOS, improve patient outcomes, and improve the quality of care delivered in the ICU.
Chapter Two: Review of the Literature

Critically ill patients are typically placed on bedrest and repositioned every 2 hours in the intensive care unit (ICU). The current body of literature was reviewed for evidence supporting the use of progressive mobility protocols. Safety of mobilization of critically ill patients and the negative effects bedrest can have on patient outcomes and length of stay (LOS) were also investigated. The literature to support the safety of a mobility protocol was investigated in order to validate the development of an evidenced-based progressive mobility protocol. This chapter will review the current literature on mobilization in the critically ill.

Methodology

Online searches were completed utilizing Ovid Medline, Mosby Nursing Index and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The search terms used were critical care, immobility, outcomes, LOS, and positioning. Findings were further limited to human studies and English language. The body of evidence was further limited to 1999-2009 to find the most current literature. Nursing and medical literature were both explored to support the practice of nursing and medicine in relation to their mobility practice, and the research supporting mobility as it relates to patient safety and outcomes.

Search results yielded from each search engine were similar and all results were cross referenced to ensure a salient group of literature. A total of 26 articles were read and reviewed based on their appropriateness to the PICO question: For immobile critical care patients does the use of a nurse-driven progressive mobility protocol reduce ICU LOS compared to every 2 hour repositioning?
Critical Appraisal of the Evidence

The critical appraisal of the evidence revealed 26 articles that were most closely related to the clinical question. Research based studies were sorted from the clinical articles, resulting in 8 studies that most closely represent the clinical question. The emerging themes noted throughout the research were safety of mobilization of critically ill patients, the effect of bedrest and various methods of repositioning on LOS and the effectiveness of a nurse-driven mobility protocol.

Stiller, Phillips, and Lambert (2004) studied the hemodynamic changes that critical care patients experienced when mobilized. The study included 31 intensive care patients who were deemed appropriate for mobilization based on a screening utilizing criteria developed by Stiller, Phillips and Lambert. The researchers audited medical records looking specifically at heart rate, blood pressure, and oxygen saturation. The study concluded that with appropriate screening, critically ill patients can be mobilized without “major deterioration in their clinical status” (Stiller, et al., p.184). This study, while a small pilot study, demonstrated that mobilizing critical patients can be accomplished safely.

To further understand the benefit of mobilization, Ahrens, Kollef, Stewart, and Shannon (2004) conducted a prospective randomized trial that looked at the effects of kinetic therapy on pulmonary complications. Kinetic therapy is better known as continuous side-to-side turning utilizing specialty patient beds. The study included 234 critically ill patients in the ICU with perfusion/ventilation (P/F) ratios less than 250, Glasgow Coma Scale score less than 11, and those patients requiring mechanical ventilation. Kinetic therapy was compared with standard repositioning. The study concluded the incidence of pneumonia was lower in the patient who received kinetic therapy versus standard repositioning. Significant differences in LOS were
noted, and the cost of stay was less with kinetic therapy group (Ahrens, et al.). This study pointed out that kinetic therapy did not directly impact LOS.

Mundy, Leet, Darst, Schnitzler, and Dunagan (2003) looked at early mobilization of hospitalized patients diagnoses with community-acquired pneumonia. This randomized trial included 458 patients who were greater than 18 years of age, with a new infiltrate on chest x-ray (CXR), and either cough, sputum or body temperature elevation, or two other symptoms including pleuritic chest pain, increased leukocytes, dyspnea, or altered mental status. The study concluded that with the use of a nurse-driven protocol, there was a decreased LOS in the early mobility group compared to those who received usual care. The LOS for the intensive care unit only group decreased to 5.8 days in the early mobility group compared to a LOS of 6.9 days in the control group. This study gives credibility to the effectiveness of a nurse-driven protocol on the patient’s LOS.

Schallom (2005) studied the effects of manual turning of patients diagnosed with pneumonia. The descriptive study was non-randomized and focused on 284 critically ill patients requiring mechanical ventilation and a tube feeding. The Clinical Pulmonary Infection Score was used to determine the incidence of pneumonia in patients after 3 days of intubation. The researchers observed the patients for evidence of repositioning every 2 hours. They concluded that the development of pneumonia was higher in patients who were not repositioned as frequently, (p=0.003).

Krishnagopalan et al. (2002) studied body positioning of patients admitted to ICU’s. This prospective, non-randomized study included 74 ICU patients. The study had 2 characteristics, the first being an email survey sent randomly to ICU attending physicians’ asking them to report their perception of whether they believed their patients were being repositioned
every 2 hours. The second part of the study involved direct observation of patients in the ICU. The study concluded that a majority of patients were not repositioned every 2 hours. The physician’s perception was that repositioning was routinely done (Krishnagopalan et al.). This study demonstrates that patients are not routinely repositioned every 2 hours, which is the current standard of care in the ICU.

The feasibility of mobility of critical patients was further demonstrated by Bailey et al. (2007). In a prospective cohort study, 103 mechanically ventilated patients served as participants. Researchers measured the activity events of each patient, including sitting upright, getting out-of-bed to a chair and ambulating. They concluded that early activity is feasible and safe in respiratory failure patients. This non-randomized study demonstrated that ambulating ventilated patients can safely be done.

Further evidence came from a study by De Jonghe, et al. (2004) who looked at the effect of ICU-acquired paresis on mechanical ventilation weaning. This prospective cohort study included 95 ICU patients who did not have any history of neuromuscular disease who were being weaned from mechanical ventilation after ≥7 days of mechanical ventilation. The study looked at muscle strength at day 7 after awakening the patient. They concluded that by preventing ICU acquired neuromuscular deterioration, patients could be weaned from mechanical ventilation quicker (De Jonghe, et al.). This study demonstrates that the current belief that sedating and paralyzing patients for long periods of time may increase LOS and mechanical ventilation weaning times.

Finally, Goldhill et al. (2007) completed a meta-analysis of rotational therapy’s role in prevention of respiratory complications. Rotational therapy is defined as use of a bed to rotate patients. Meta-analysis involves the analysis of 15 non-randomized, uncontrolled, or
Progressive Mobility

retrospective studies and 20 prospective, randomized controlled trials conducted between 1987 and 2004. Researchers concluded that the standard of care is manual repositioning every 2 hours. They also concluded that rotational therapy decreases the incidence of pneumonia, but there was not a statically significant difference in weaning times from mechanical ventilation (Goldhill, et al.). This study did not directly examine LOS; however, the meta-analysis proves that mobility through means other than manual repositioning decreased the incidence of pneumonia, a complication that may result in an increased LOS.

Conclusion

The research suggests that early mobility, in and out-of-bed can both be safely performed. Reduction in the development of complications can indirectly result in decreased LOS, and promotion of increased healing can directly impact the LOS. The benefits of bedrest have not been supported in the literature, and the consequences of not mobilizing our patients early can be costly, both in terms of LOS, complications and rehabilitation time.

Repositioning is intended to occur every 2 hours; however, the research suggests this is only actually performed 2.7% of the time (Krishnagopalan, et al.). In current practice, there is reluctance by nursing to attempt to get critically ill and ventilated patients out-of-bed, or even progressing them to a sitting position. Their reluctance stems from a fear of the patient deteriorating or having an unplanned extubation. The culture within the ICU setting is one of sedation and therapeutically paralyzation of patients until extubation, often resulting in prolonged length of time on mechanical ventilation and subsequently an increased LOS.

Based on the reviewed evidence, the development of a progressive mobility protocol has the potential to improve patient outcomes, including decreasing their LOS. Nursing currently has the ability to manage their patient mobility with every 2 hour repositioning, however; the lack of
structure surrounding its actual creates a culture of non-compliance. A nurse-driven mobility protocol will allow nursing to manage their patient’s mobility, while providing them with a succinct order to progress the patients in based on their tolerance. This protocol will serve as the catalyst for changing the culture from one of sedation to one of progressive mobility resulting in a decreased LOS.
Chapter Three: Conceptual Model for the Evidence-Based Practice Change

Utilization of an evidenced-based practice model allows for a framework for practice change. The term evidenced-based practice (EBP) is often over and incorrectly used when defining the use of research findings. Clarifying the difference between research utilization and EBP allows for a clearer understanding and path for implementation of the findings. “Research utilization is the use of research knowledge, often one study, in clinical practice, whereas EBP involves a larger skill set and takes into consideration many factors” (Melynk & Fineout-Overholt, 2005, p. 187). The use of an EBP model allows for integration of the best evidence coupled with practitioner skill, patient preferences and the resources available. This chapter includes the use of a conceptual model for EBP change.

*Stetler Model in Evidence-Based Practice*

The Stetler model of research utilization and evidenced-based practice was chosen for the implementation of a nurse-driven progressive mobility protocol. The decision was based on the notion that the Stetler model is a “practitioner-oriented model because it focuses on critical thinking and use of findings by the individual, knowledgeable practitioner” (Melynk & Fineout-Overholt, 2005, p. 189). "The Stetler model of research utilization was designed with the assumption that research utilization could be the undertaking of not only organizations, but individual clinicians" (Polit & Beck, 2007, p. 683). This model is most relevant to this project because it "was a model designed to promote and facilitate critical thinking and the application of research findings in practice" (Polit & Beck, 2007, p. 683).

Implementation of nurse-driven protocols in the ICU can be a very challenging process, however; the clarity of the model will guide me in the process. The highly individual differences
between each patient make a standardized approach to care difficult at times. The Stetler model serves a solid framework for ensuring successful implementation of the evidence.

The Stetler model is based on five progressive phases of activity. The phases include Preparation, Validation, Evaluation, Translation and Evaluation (Melynk & Fineout-Overholt, 2005). The preparation phase includes identification of the purpose, the validation phase involves validating if the research that exists is relevant, and the evaluation phase further evaluates the research for appropriateness to the purpose. The translation phase of the Stetler model involves deciding what research to keep and the final phase, evaluation, involves determining the impact the findings will have on the initial purpose of problem (Melynk & Fineout-Overholt, 2005). The model follows a linear approach, however, it allows for variation and movement back and forth through the steps. “Its steps and concepts can be integrated into a professional’s way of thinking about research utilization and EBP” (Melynk & Fineout-Overholt, 2005, p. 192).

Conclusion

The implementation of an EBP project can be challenging and exciting. The use of a solid framework such as the Stetler model of Research Utilization and Evidenced Based Practice minimizes the challenge by allowing individuality on the part of the practitioner. The Stetler model promotes critical thinking, and without critical thinking application of the evidence can become task oriented (Melynk & Fineout-Overholt, 2005). A nurse-driven progressive mobility protocol requires the nurse to critically evaluate and respond to the patient. The Stetler model supports the nurses’ decision making process as they critically think through the protocol.
Chapter Four: Project Design

The evidence supporting the benefits and safety of mobility in the critically ill serves as a solid foundation for the development of a nurse-driven progressive mobility protocol. Critically ill patients typically do not get out-of-bed until they have been extubated, resulting in longer length of stay (LOS). The use of a progressive mobility protocol will serve as a tool for nursing to utilize as they progress their patients mobility. The mobility protocol consists of 6 progressive steps and movement from one step to another is based on the patient’s physiological response. This will empower the nurse and give them the tools necessary to be proactive in providing safe therapeutic mobility for their patients.

This chapter addresses an evidenced-based practice (EBP) progressive mobility protocol. This nurse-driven progressive mobility protocol is based on gradual progression from a supine to an upright, out-of-bed position. The transition toward an upright position is based on the patient’s physiological response to the mobility. The nurse-driven progressive mobility protocol will allow for safe progression in patient mobility resulting in a decreased LOS in the hospital.

Development of a Progressive Mobility Protocol

EBP involves taking the research findings and applying them to the patient population and the institution where you practice. Experiences of staff, the needs of the patients and the availability of resources guided the development of this protocol. The progressive mobility protocol developed in this project is based on the research supporting that early mobility is safe and can positively impact patient outcomes.

Project development included input from the intensive care unit (ICU) physicians and nurses. The research was presented and conversations surrounding the barriers to mobility and the need for a standardized approach to pushing early mobility in the critically ill patient were
crucial to the development of a protocol that represented the needs of the ICU staff and patients. Multiple drafts of the protocol were crafted, and hands-on application of each step of the protocol was practiced on the patient care beds to ensure functionality.

The specific positions for each step were developed based on the literature available and the current functionality of the patient care beds in the ICU. The patient care beds in the ICU elevate in 15 degree increments and have reverse Trendelenburg capability. Reverse Trendelenburg is when the head of the bed (HOB) is elevated higher than the feet. In order to accomplish this, the HOB is elevated and the bottom of the bed is lowered. This decreases pressure on the abdomen and eliminates the feeling of sitting in the bed.

Nurse champions on the unit were identified based on their eagerness to become involved and their current understanding of the need for early mobility in the critically ill. The clinical nurse specialist (CNS) and the charge nurses were identified as the key participants for the planning, implementation, and evaluation of the protocol’s effectiveness. The support of the ICU medical director was also elicited and served as the foundation for physician support needed to implement the nurse-driven progressive mobility protocol.

Description of the Progressive Mobility Protocol

The progressive mobility protocol was designed to be a standing order in the ICU. After 24 hours in the ICU, critically ill patients automatically had the mobility protocol (Appendix A) ordered as part of their care. The protocol was designed to promote progressive mobility 3 times a day. The need for sleep at night is critical to healing; therefore, the protocol was designed to be implemented 3 times during the day and evening hours. The exact timing of the mobility was solely determined by the nurse caring for the patient. This was done to promote nursing management of the mobility, while supporting the individual needs of each patient.
Nursing screens the patient for absolute contraindications such as unstable fractures, comfort care, respiratory of cardiovascular instability requiring aggressive pharmacological support, unstable neurologic function with draining intracranial pressure monitoring, and the presence of femoral sheaths. Patients with no absolute contraindications will have the protocol implemented; ineligible patients will be re-evaluated every 4-8 hours for eligibility.

The 6 step progressive upright mobility protocol allows nursing to manage their patient’s mobility through a series of mobilization positions. Patients with no absolute contraindications will progress in a step wise fashion through the 6 steps of the protocol. The protocol steps include:

Step 1: HOB elevated to 45°, evaluate patient tolerance
Step 2: HOB elevated to 45° and legs in dependant position (reverse Trendelenburg)
Step 3: HOB elevated to 60° and legs in dependant position (reverse Trendelenburg)
Step 4: Dangle legs with assist, feet touching floor is possible support torso but encourage independence
Step 5: Stand patient at bedside with assist, patient has to bear weight and transfer to the chair by pivoting or taking 1-2 small steps
Step 6: Walk with assistance using walker if necessary then walk independently if possible

Successful progression from one step to another is dependent on the patient exhibiting no respiratory or cardiovascular compromise for at least 60 minutes at a step. Respiratory compromise included increased work load of breathing, fatigue, shortness of breath, or increased respiratory rate. Symptoms of a cardiovascular compromise included increased or decreased heart rate or blood pressure, a change in cardiac rhythm, or the development of chest pain.
Patients who exhibit respiratory or cardiovascular compromise during their progressive mobility are returned to the position of an elevation of the HOB 30 degrees. A complete assessment is completed by the registered nurse (RN), and the physician is notified if the patient required any interventions. Patients who tolerate the progressive mobility without any respiratory or cardiovascular compromise are to be returned to a 30 degree head of the bed position to promote their rest. The patient is progressed to the next step on the protocol the next time mobility is attempted.

*Plan to Roll out the Protocol to ICU*

The ICU chosen for the role out of the progressive mobility protocol is a 22 bed adult medical-surgical ICU located in Central New York. The institution is a 500+ bed facility. The ICU is staffed by RN’s and there is a nurse to patient ratio of 1:2. The medical staff consists of third and fourth year residents and 4 critical care attending physicians. The most common diagnosis admitted to the ICU is pneumonia, sepsis and GI surgery and neurological diagnosis.

The education for the nurses on the protocol was designed as a brief overview of the risks of immobility and the protocol, written in a format that the ICU routinely uses for disseminating information (Appendix B). This educational tool was designed to be disseminated to all nurses and physicians in an effort to spark some interest in the topic and the current evidence. Individual education at the bedside and during nursing and physician rounds served as the follow up to the initial education. The need for access to assistance for implementation of the protocol or assessment of the patients’ response was deemed as crucial to ensuring successful and universal implementation of the protocol. On unit support by the CNS and the charge nurses was chosen by the staff as the preferred resource to deal with any questions of issues that came
up with the implementation. The CNS clinically and educationally supports the ICU on all shifts and is the key “go-to” person for all clinical practice changes.

Project Outcomes

The progressive mobility protocol is an evidenced based tool to transition patients from a supine position to an upright ambulating position. The anticipated outcome of interest is the effect of early mobilization on LOS in the hospital. The average LOS for patients in the ICU, for the previous 12 months was 13.5 days. The institution does not measure LOS in terms of pure ICU time; rather, they measure LOS for any patient who spends any or all of their hospitalization in the ICU.

The ICU LOS data is compiled by the hospitals Quality Improvement (QI) Department and was accessible on line for evaluation and review. LOS was evaluated for the 12 months prior to implementation, and will serve as the benchmark for LOS prior to implementation of an early mobility protocol. The plan was to evaluate LOS at 1 month, 3 months, 6 months and 12 months post protocol implementation. The LOS data will be compared against the benchmark to determine if the progressive mobility directly impacted the LOS in the hospital for patients spending time in the ICU.

Conclusion

Critically ill patients are subjected to long periods of immobility which often results in prolonged intubation and increased LOS in the ICU. The development of an early mobility protocol was aimed at decreasing this LOS in the ICU and hospital. The project was designed as a true evidenced-based practice change, taking the current research available and applying the experiences of the ICU nurses and physicians, the specific needs of the patients, and the availability of resources to produce a progressive mobility protocol. The utilization of input from
nursing and medicine in a multidisciplinary approach to this EBP progressive mobility protocol allowed for increased support for adherence to safely progress the ICU patient’s mobility.
Chapter Five: Implementation Procedure and Process

Promotion of progressive mobility in the critically ill is the practice change needed to promote healing and recovery in the intensive care unit (ICU). “Important elements that must be present for change to be accomplished successfully are vision, belief, strategic planning, action, persistence, and patience” (Melnyk & Fineout-Overholt, 2005, p. 444). Cultivating a culture of change, and promoting a multidisciplinary team approach ensures success and understanding. This chapter includes the vision, planning, development, and implementation of a progressive mobility protocol in the ICU.

Evidenced-based Project Vision

The culture within ICU’s across the country is often one of sedation which results in the critically ill patient becoming deconditioned and weak. Nursing staff are continually challenged to obtain the resources needed to get patients out-of-bed, only to face the reality that many patients will need to be returned to bed within a very short period of time. A standardized approach to mobilizing critically ill patients is needed to improve patient outcomes and the quality of care in intensive care units across the country.

The vision for this standardized approach to mobility stemmed from the frustration staff felt when their attempts to get their patients out-of-bed failed or the duration of time out-of-bed was too short to be effective. Efforts to promote rest and recovery in the critically ill have actually led to weakness and loss of functionality due to immobility. The need for an intervention more detailed than the current practice of repositioning every 2 hours became the vision for this evidenced-based practice (EBP) change.
Project Implementation Activities

The current literature was reviewed to identify interventions that promote mobility in the critically ill. The concept was informally discussed with the ICU nursing staff and physicians at a particular agency to assess the current views on this issue. Almost immediately, it became clear that an easier and more beneficial way to manage mobility in the critically ill was both needed and wanted. This solidified that the vision was congruent with the needs of the institution.

Collaboration among all members of the ICU care team was a crucial step in providing a framework for protocol development. The need for nurses, physicians and every member of the healthcare team to communicate clearly and effectively to one another is the foundation for safe and effective patient care. The need for a change in mobility practices was voiced by both nursing and medicine, providing the collaborative structure needed for development and implementation of a progressive mobility protocol. Promotion of a common vision and goal, with all members of the healthcare team, strengthened the support and promoted active participation in the development of a protocol that addressed all members’ views.

A collaborative, multi disciplinary team was constructed to begin development of a progressive mobility protocol. The team chosen from the ICU staff consisted of the clinical nurse specialist (CNS), 3 charge nurses, a respiratory therapist, and the medical director. These individuals were chosen for the team based on their expressed interest in mobility and recommendation by their peers as unit champions. The need for multiple healthcare providers to be represented was to ensure each disciplines individual needs and concerns were incorporated into the protocol development. Care of the ICU patient requires medical, nursing and respiratory therapy interventions and each had input into the logistics of the protocol. The care rendered to a critically ill patient is often complex. The collaborative input of all the disciplines promoted a
more holistic, comprehensive assessment to these complex patient care needs. This resulted in
the promotion of a better understanding of the reliance on each disciplines contribution to the
care, and their role in promotion of safe mobility.

The literature was presented and discussed with the members of the team and a timeline
for development and implementation was agreed upon. The team met a total of 6 times before a
finalized version of the protocol was produced and an implementation plan formalized. It was the
consensus of the team to make the protocol a standing order in the ICU. A standing order is an
order that is automatically ordered on all patients at the time of admission. Instituting the
protocol in the form of a standing order eliminated the chance the protocol could be
inadvertently not ordered or implemented.

The institutional review board (IRB) of the hospital was consulted prior to
implementation. It was deemed IRB approval was not warranted because mobility was a nursing
intervention that was already being performed on patients in the ICU. All patients admitted to the
ICU had a standing order for activity as tolerated. The IRB believed that the progressive mobility
protocol was an extension of an already existing practice standard, and therefore, no IRB
approval was needed.

Two separate mock implementations of the protocol were completed by the team prior to
implementation. The mock implementations consisted of advancement of a patient through each
step of the protocol utilizing the functionality of the patient care beds. The functionality of the
patient care beds included the ability to elevate the head of the bed, facilitate a reverse
Trendelenburg position, and dangle the patient legs while in bed. This step ensured the positions
accomplished with the patient care beds were congruent with each of the progressive mobility
protocol steps.
The nurse-driven progressive mobility protocol was presented to the staff in a step wise format. The first step was a brief education bulletin on the dangers of immobility and presentation of the protocol (Appendix B). This is the typical format the ICU staff utilizes when new practice changes or information needs to be disseminated. The education was also electronically mailed to each nurse, placed in the unit communication book, and advertised on the bulletin board in the ICU break room.

The second step of the education was one-on-one education at the bedside with each nurse. The education program consisted of assessment of patients for inclusion in the protocol, actual implementation of the protocol if appropriate, and review of the patient care beds mobility functions. Bedside teaching of the protocol and clinical support for the nursing staff were essential. This approach allowed the nurse to assess their patient and initiate the protocol immediately after education. Support at the bedside promoted meaningful application to practice. The ability to take new knowledge and immediately apply it is a method utilized in the ICU frequently.

A laminated copy of the progressive mobility protocol was placed in the patient care binders at each bedside. Sample documentation of steps in the protocol was also placed in the binders and could be used as a reference. The bedside binders are a tool utilized by nursing, and contained all information needed to care for the patient. The binders contain the patients care record, multiple reference materials, and documentation records for the shift. Inclusion of the progressive mobility protocol in these bedside binders was done in order to promote immediate accessibility during patient care.

Patient care rounds are completed 3 times a day in the ICU. The rounds are completed by the physician, the nurse, the respiratory therapist, and the clinical nurse specialist (CNS).
Mobility was added to the checklist used for discussion during rounds. During rounds, the patient’s condition was discussed. The patient’s inclusion in the mobility protocol, and the step they were currently on in the protocol was incorporated into the rounds discussion.

Daily appraisal of mobility protocol compliance was completed during the first 2 weeks after protocol implementation. These appraisals involved assessment of each patient in the ICU for protocol eligibility and assessment of whether the protocol had been implemented. The nursing staff was included in these assessments. Nurses who had successfully implemented the protocol were commended and a discussion ensued regarding their comfort with the mobility protocol and any questions they had were answered. Nurses who had not implemented the protocol were re-educated as to the risks of immobility and the assessment of their patients for inclusion was completed together. After the first 2 weeks of implementation, the compliance assessments were decreased to twice a week.

Conclusion

Development and implementation of the nurse-driven progressive mobility protocol was a multi-disciplinary team approach. The need for representation from the various care givers involved in care of the ICU patient increased the understanding and further strengthened the support on the unit. The charge nurses and the CNS were instrumental in championing the implementation and supporting its continuation. The successful implementation was the collective effort of all team members. The support of each member strengthened the advocacy for mobility in the critically ill patients.
Chapter Six: Evaluation and Outcomes

The progressive mobility protocol is an evidenced based tool to transition patients from a supine position to an upright ambulating position. The anticipated outcome of interest was the effect of early mobilization on length of stay (LOS) in the hospital. The institution where the project was implemented does not measure LOS in terms of pure intensive care unit (ICU) time. Rather, they measure LOS for any patient who spends any or all of their hospitalization in the ICU. To evaluate the effectiveness the progressive mobility had on decreasing LOS, the total hospital LOS for patients with time in the ICU will be the data measurement. This chapter discusses the evaluation of the effectiveness of the progressive mobility protocol had on reducing LOS.

*Intended Outcome*

The intended outcome of measure post implementation of the progressive mobility protocol was a reduction in hospital LOS. LOS was chosen as the outcome measurement based on assessment of the intent of the protocol. The implementation of a progressive mobility protocol is expected to reduce LOS, decrease the incidence of pressure ulcers, decrease ventilation time, and decrease the incidence of hospital acquired pneumonia. In assessing all of these potential benefits to early mobility, LOS was the measurement most inclusive of the effectiveness of the protocol. Measurement data of ventilation time and incidence of complications were not available for pre-implementation comparison. LOS was the most appropriate outcome measurement available to evaluate the effectiveness of early mobility in the critically ill.

In order to establish a benchmark, LOS for the ICU patient at the institution of interest was evaluated for the 12 months prior to implementation. ICU LOS is calculated as the total
number of days and hours a patient, with any portion of their hospital stay in the ICU, spend in the hospital. The implementation of the progressive mobility protocol was designed to result in an overall decrease in the LOS. Pre-implementation average LOS for the previous 12 months was 13.5 days.

**Measurement of Length of Stay**

The ICU LOS data was compiled by the hospital's Quality Improvement (QI) Department and was accessible in a shared folder in the hospital computer system for evaluation and review. The data from admission discharge and transfer within the hospital is all computerized which allowed for immediate calculation of the LOS data upon patient discharge. The data was accessible for interpretation throughout the month. To measure effectiveness of the progressive mobility protocol, LOS data was evaluated at 1 month, 3 months, 6 months and 12 months post protocol implementation.

**Effectiveness of the Nurse-driven Progressive Mobility Protocol**

The average hospital LOS for the 12 months prior to protocol implementation was 13.5 days. The LOS varied between 9.6 and 15.4 days. The LOS for October 2009, the month the protocol was instituted, the LOS was 10.4 days. This 1 month measurement of LOS data demonstrated a decrease in LOS from the 12 month pre-implementation average; however additional data is required to demonstrate a correlation between the protocol and the LOS reduction. Future measurement will occur at 3 months, 6 months, and 12 months post implementation for comparison against the benchmark LOS value of 13.5 days.

The first month of LOS data was 2.1 days shorter than the 12 month benchmark average LOS. While exact cost of hospitalization is highly dependent on the individual needs of the patients, research suggest the cost of hospitalization is between $1500 and $3000 per day
(Rothberg, Abraham, Lindenauer & Rose, 2005). A reduction in LOS by 2.1 days, as seen in the first month, could compute to a greater than $6000 reduction in healthcare costs. The reduction in the risk of hospital acquired complications and the cost of loss of work due to hospitalization are also contributors to the overall cost savings that result from a reduction in LOS.

Conclusion

Critically ill patients are subjected to long periods of immobility which often results in prolonged ventilator time, and increased LOS in the ICU. Mobilizing the critically ill patient utilizing a nurse-driven protocol was aimed at reducing hospital LOS. Initial data suggests that the nurse-driven progressive mobility protocol has the ability to reduce hospital LOS for ICU patients. Evaluation of LOS data will continue for a 12 month period to determine the extent to which the mobility protocol was effective at reducing LOS in the hospital for the ICU patient.
Chapter Seven: Implications for Nursing Practice

The need for a standardized approach to mobility was demonstrated in the evidence and observed in the clinical setting. The development and implementation of a nurse-driven progressive mobility protocol was intended to reduce hospital length of stay (LOS) for the critically ill patient. Preliminary data suggest the protocol has the ability to reduce hospital LOS. Implications the protocol on nursing extends beyond LOS. This chapter includes the implications to nursing that resulted from the development and implementation of a progressive mobility protocol.

Implications to Nursing

The development of an evidenced-based practice (EBP) progressive mobility protocol has solid foundations consistent with the Essentials of Doctoral Education for Advanced Nursing Practice outlined by the American Association of Colleges of Nursing (AACN, 2006). Completion of this practice change project has demonstrated implications to nursing in many ways, each consistent with the 8 Essentials, or indicators of quality, for the doctorate of nursing practice (DNP) degree.

Scientific Underpinnings for Practice. The DNP prepared registered nurse (RN) has the capacity to “translate the knowledge quickly and effectively to benefit patients in the daily demands of practice environments” (AACN, 2006, p. 9). The development of a progressive mobility protocol stemmed from the frustration ICU nurses felt when they moved critical patients who had been in bed for a long period of time out-of-bed. The nurses noted that patients deconditioned easily when placed on bedrest. The development of a progressive mobility protocol involved translation of what was already in the existing body of evidence and applied it to the existing practice environment. While based on the evidence, the practice change also
incorporated the needs of the nurses and patients in the ICU. Nursing staff are continually challenged to obtain the resources needed to get patients out-of-bed, only to face the reality that many patients will need to be returned to bed within a very short period of time. The progressive mobility protocol demonstrates an understanding of the daily demands nurses face and overcome them with application of the evidence in a manner that benefits the patients.

*Organizational and Systems Leadership for Quality Improvement and Systems Thinking.*

The primary outcome measurement of the institution of a progressive mobility protocol was a reduction in hospital LOS. The standardization of how mobility is accomplished with regards to the critically ill had the ability to impact not only the practice in the ICU, but across the entire organization and healthcare as a whole. The impact a reduction on LOS will have is vast.

The first impact a reduction in LOS will have is on patient outcomes. The less time a patient spends in the hospital, the lower the risk of acquiring a hospital acquired infection or complication such as pressure ulcers and deconditioning. The reduction in LOS also has financial implications for the patient and institution. A reduction in LOS reduces costs associated with the care of the patients.

Development of a progressive mobility protocol has the ability to positively impact quality across the entire healthcare system. The culture in the ICU, at the agency of interest, was not progressive and the patients were often not mobilized until fully recovered. This progressive mobility protocol has inspired informal leaders on the unit to consider mobility as part of the patients care and recovery, not an action performed after recovery.

The benefits of early mobilization have been demonstrated with the preliminary LOS data. If subsequent data additionally supports a reduction in LOS, the progressive mobility protocol could be expanded to additional nursing units across the organization. The patients
treated in each nursing unit differ, as do the patient care beds, however; the concept of early mobility can be replicated in practice settings outside the ICU.

*Clinical Scholarship and Analytical Methods for Evidence-Based Practice.* “Translation of research into practice and dissemination and integration of new knowledge” (AACN, 2006, p. 11) is another competency of the DNP prepared registered nurse (RN). The development and implementation of an EBP progressive mobility protocol took the complex critical care patient and employed a basic intervention to improve patient outcomes. Mobility is a simple concept in the complex world of critical care nursing, however; it is an intervention that is not often employed until patients are recovered from their illness or injury. The promotion of mobility is safe and was simply integrated into the ICU routine through a systematic protocol. Through translation of the existing research, the care in the ICU was transformed into one of promotion of mobility.

The dissemination of this protocol and the reduction in LOS data are subsequent steps to be taken to expand clinical scholarship. The practice change and data have been shared at the critical care performance improvement council meeting, which reports up to the hospital administration and the board. Further dissemination will occur in the clinical newsletter internal to the hospital. This newsletter outlines clinical practice changes occurring throughout the facility. This internal dissemination will hopefully elicit an interest in pursuing progressive mobility in other clinical areas of the hospital.

The final dissemination, after several more months of LOS data is collected, will be for professional publication in the critical care nursing journals. The need to share this practice change and assist other organizations in adopting the practice of progressive mobility is key to
advancing nursing practice. The need for evidenced based practice changes at the bedside across all of critical care is essential to improve patient outcomes and promote practice changes.

*Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care.* The concept of progressive mobility of critically ill patients was accomplished utilizing existing technology in the ICU. Mobilizing the critically ill has historically been difficult to accomplished, therefore; it has been difficult to integrate into the normal ICU routine. The problem with patient mobility prior to the protocol was it required a lot of nurses to assist a patient out-of-bed. Through utilization of the existing patient care beds, new modalities can be utilized to mobilize the patients with bed movement rather than manpower. Patients can be moved, utilizing the modalities of the patient care bed, to the point in which they can transfer to a chair out-of-bed. The use of existing bed modalities allowed for a decrease in nursing manpower required to move patients. This increases nursing satisfaction and positively impacts the patients because they are being mobilized earlier and more efficiently than when manual repositioning was the practice.

*Health Care Policy for Advocacy in Health Care.* Nursing is a profession of advocacy. Through implementation of a standardized approach to mobility, nurses are advocating for a decrease in complications and an increase in recovery by decreasing LOS. Health care policy “creates a framework that can facilitate or impede the delivery of health care services or the ability of a provider to engage in practice to address health care needs” (AACN, 2006, p. 13). Creation of an evidenced-based practice progressive mobility protocol provided the framework for facilitating an increase in mobility and patient advocacy. Quality of care delivery and patient safety were both impacted and nursing staff have a solid framework to base their nursing interventions on to promote mobility in their patients.
Prior to the progressive mobility protocol, the standard practice was activity as tolerated for patients. This was the standing order for all patients admitted the hospital. With the documented initial success in reducing LOS utilizing a progressive mobility protocol; it is feasible that the standard practice will become a nursing policy. If subsequent month LOS exhibits further evidence of LOS reduction, it will be advocated that the use of progressive mobility become a documented standard of care in the ICU.

*Inter-professional Collaboration for Improving Patient and Population Health*

*Outcomes.* The creation and implementation of the progressive mobility protocol required input from medicine, nursing, and respiratory therapy. This multi-disciplinary approach strengthened the protocol and the support behind its implementation. The evidence used for the foundation of this practice change was also from both medical and nursing research, and supported the need for a multi-disciplinary approach. The support respiratory therapists and the ICU attending gave to the practice change helped prove the interventions was valid.

Multi-disciplinary input strengthens the knowledge base and the support behind any practice change. The need to consult the existing body of evidence from many disciplines as well as include them in planning and implementation supports the needs of the patient and the organization collectively. Improving care for the individual ICU patient, as well as the ICU population as a whole, was best accomplished utilizing a holistic, multi-disciplinary approach.

Collaboration among the physicians and nurses in the ICU contributed to the successful implementation of the progressive mobility protocol. The clinical nurse specialist (CNS) as well as the unit manager promoted the protocol and served as resources for both education and protocol implementation. Inclusion of the staff, leadership, and members of other disciplines
contributed to the knowledge, strengthened the support for the protocol, and demonstrated interprofessional collaboration with a common purpose.

*Clinical Prevention and Population Health for Improving the Nation’s Health.*

Prevention of hospital acquired illnesses and complications can be improved with a decreased LOS. Prevention of deconditioning related to immobility is also positively influenced by the progressive mobility protocol. By decreasing LOS in the ICU patient, nurses are decreasing their risk of deconditioning, and decreasing the recovery time required in the hospital. By returning patients to their prior state sooner, nurses are decreasing the risk of complications. Economic implications to the institution and the patient are also influenced. Institutions spend less to care for the patient when the LOS is increased, and patients are returned home sooner therefore decreasing the financial strain of hospitalization and loss of work productivity. The development of this progressive mobility protocol, there is a strong focus on prevention of complications and this concept can be applied to other clinical areas inside and outside the organization it was conducted in.

*Advanced Nursing Practice.* The development of a progressive mobility protocol required a critical assessment of the existing body of evidence and synthesizing the findings. These findings then needed to be evaluated and assessed for applicability to the patient population, the institution and the needs/skills of the nurses in the ICU. This advanced level of thinking is consistent with the Essentials of the DNP prepared RN. Designing and implementing a practice change of this magnitude not only strengthened the nursing science, but contributes to advancing nursing practice. Transforming the culture within the ICU from one of sedation and rest to one of mobility was the foundation of this therapeutic intervention. Nursing now has the tools they need to facilitate a higher level of care, promote safety and decreased recovery time, and to foster
relationships with the patient through active involvement of the patient in their care. The advancement in the care in the ICU through the development of a progressive mobility protocol allowed for fostering of critical appraisal of the evidence to allow nurses to apply it to their clinical settings.

A reduction in LOS has personal implications as well. Less time in the hospital means patients are returning to their families and lives sooner. This implication, while not easily measured, is a positive advancement in the care of the critically ill.

Limitations of the project

Implementation of a nurse-driven progressive mobility protocol in the ICU had a few limitations. The first limitation involved nurses compliance with the protocol. The protocol became a standing order in the ICU, however without constant surveillance; there was a tendency on the part of the nurse to revert back to the previous standard of manual repositioning. The support of the unit manager and CNS help overcome some of this, but like all culture changes, it takes time to undo previously learned behaviors. The constant presence and accessibility of support for the protocol implementation gave the staff an added resource as well as served as an informal accountability mechanism because they know someone was watching. In retrospect, additional nursing staff would have been included in the development stages. Inclusion of additional nurses would have provided more champions for the project on each shift. These informal leaders have a tremendous power of influence over their peers and can only strengthen the implementation and compliance of the protocol.

The outcome measurement utilized to evaluate the effectiveness of the nurse-driven progressive mobility protocol was LOS. LOS has the ability to be influenced by multiple variables including the diagnosis of the patients admitted to the ICU. The protocol was
implemented at the beginning of influenza season. The average volume in the ICU the month of implementation was greater than the previous 3 months and the average daily volume of ventilator usage was also increased. The LOS for the month of implementation revealed a decrease from the 12 month average prior to implementation, however; additional data points are needed to demonstrate direct effect.

The measurement of LOS for the ICU patient is not calculated as pure ICU time, rather total time in the hospital for a patient with any portion of their stay in the ICU. The project was formulated to measure a decreased in ICU LOS. Without data on pure ICU LOS for the 12 month period prior to protocol implementation, it was not possible to measure a true decrease in ICU LOS; rather the measurement is total hospital LOS. This was a limitation to direct influence on the ICU LOS.

Conclusion

Meeting the demanding needs of healthcare today requires translation of knowledge into effective practice changes that meet the needs of the patients, nurses and institutions alike. Through development of a progressive mobility protocol the existing research was translated into an intervention aimed at reducing hospital LOS. The outcome of interest was simply LOS, however; the implications to nursing were vast. With change comes the duty to disseminate the findings for the good of many. Looking beyond the walls of the ICU, the dissemination of these findings for potential applicability to other clinical areas allows for further advancement of patient care.
Chapter Eight: Conclusion

Critically ill patients are subjected to long periods of immobility, which often results in prolonged ventilation time, and increased length of stay (LOS) in the intensive care unit (ICU). Bed rest for the critical care patient can lead to complications such as pneumonia, pulmonary embolism, dampened carotid baroreceptor response, pressure ulcers, muscle atrophy and joint contractures, all of which can lead to an increased LOS in the ICU (De Jonghe, Bastuji-Garin, Sharshar, Outin, & Brochard, 2004; Morris, & Herridge, 2007; Rauen, Chulay, Bridges, Vollman, & Arbour, 2008). Reduction in the development of complications can result in decreased LOS, and promotion of increased healing can directly impact the LOS. The benefits of bedrest are not supported in the literature. The consequences of immobilizing the critically ill patient early can result in an increased hospitalization time. The potential for costly and deadly complications increases with each day of immobility.

The barriers and resistance to mobilizing the critically ill patient are present in nearly every ICU in the country. The additional staff needed to safely get patients out-of-bed is often overwhelming. In addition, the ICU patient often decompensates easily when transferred out-of-bed, resulting in short duration of time spent out-of-bed. Frustration on the part of nursing staff often discourages them from attempting future mobilization.

The need for a standardized approach to mobilizing critically ill patients is essential to improve patient outcomes and the quality of care in intensive care units across the country. The evidence supporting the benefits and safety of mobility in the critically ill serves as a solid foundation for the development of a nurse-driven progressive mobility protocol. Critically ill patients typically do not get out-of-bed until they have been extubated, resulting in longer LOSs.
The time has come to replace the current standard every 2 hour repositioning with an evidenced-based intervention aimed at promoting the health and recovery of our critically ill.

A nurse-driven progressive mobility protocol allows for safe progression in patient mobility therefore decreasing complications and LOS. The research suggests that early mobility, in and out-of-bed can both be safely performed. Prior to the progressive mobility protocol, there was reluctance by nursing at a particular agency to attempt to get critically ill and ventilated patients out-of-bed, or even to progress them to a sitting position. Their reluctance stemmed from a fear of the patient deteriorating or having an unplanned extubation. The culture within the ICU setting has been transformed from one of sedation until extubation, to one of promotion of early mobility as part of recovery.

Based on the reviewed evidence, the development of a progressive mobility protocol was the intervention with the potential to improve patient outcomes, including decreasing their LOS. Implementation of a nurse-driven mobility protocol has allowed nursing to manage their patient’s mobility, while providing them with a succinct order to progress the patients in based on their tolerance. This protocol served as the catalyst for changing the culture from one of sedation to one of progressive mobility resulting in a decrease in LOS.

Preliminary LOS data suggest that the early mobilization of critically ill patients did result in a reduction in hospital LOS. The LOS data will continue to be monitored for a period of 12 months for additional validation of the progressive mobility interventions impact on LOS. Development of this standardized approach to mobilizing the critically ill patient proved to be the intervention needed to transform care in the ICU. The evidenced-based approach to mobility was the catalyst needed to change the ICU culture from one of rest and immobility to a culture
that promotes recovery through mobility. The progressive mobility protocol aimed at reducing hospital LOS was the clinical practice change needed to promote this recovery.
References


Appendix A

**Progressive Mobility Protocol**

*Contraindications to Progressive Mobility*

- Spinal Cord Injury
- Unstable Intracranial Pressure &/or ICP monitoring/draining
- Unstable fractures with or without traction
- CRRT or HD (during therapy)
- Femoral sheaths
- Comfort Care
- Re-evaluate for contraindications every shift until free of contraindications
- Cardiovascular instability
  - Hypotension
  - Tachycardia > 130 bpm
  - Unstable cardiac rhythm
  - Multiple pressors
- Respiratory Instability
  - Fio2 > 0.60
  - PEEP > 10
  - RR > 35 bpm
  - Pressure control ventilation

Does patient have hemodynamic instability? (↓O2 sat, ↓BP, ↑HR) with repositioning every 2 hours

No →

Yes →

**Progressive Mobility Protocol**

**Step 1**
HOB elevated to 45°, evaluate patient tolerance

**Step 2**
HOB elevated to 45° and legs in dependant position (reverse Trendelenburg)

**Step 3**
HOB elevated to 60° and legs in dependant position (reverse Trendelenburg)

**Step 4**
Dangle legs with assist, feet touching floor is possible support the torso but encourage independence

**Step 5**
Stand patient at bedside with assist, patient has to bear weight & transfer to chair by pivoting or taking 1-2 small steps

**Step 6**
Walk with assistance using walker if necessary then walk independently if possible

*Consult with MD for possible CLRT (Continuous Lateral Rotational Therapy)
*Continue to re-evaluate for Progressive Mobility Protocol

**Progression to next step in the protocol is initiated when the patient tolerates a step for greater than 60 minutes with no cardiovascular or respiratory decomposition

*Respiratory Therapy should be present at all times when mobilizing or ambulating intubated patients

* Patients should have Progressive Mobility attempted 3 times daily

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Appendix B

Progressive Mobility in the ICU

**Causes of Immobility:**
- Mechanical Ventilation
- Coma
- Stroke
- Injury
- Ignorance of current literature supporting early mobility

**Complications:** list is not all inclusive just most common
- **Pulmonary Dysfunction**- r/t decreased respiratory excursion and stasis of secretions resulting in atelectasis and pneumonia
- **Orthostatic hypotension**- related to hypovolemia and dampened carotid receptor
- **Reduction in Muscle Contraction**- Esp. over ↓ extremities causing reduced venous return to heart, venous stasis and DVT
- **Bone demineralization**- caused by lack of weight bearing on skeleton
- **Joint contractures**- caused by shortening of muscle fiber d/t atrophy
- **Pressure ulcers**- this is obvious do I need to explain?
- **Ileus**- related to poor GI motility
- **Depression**- r/t decreased functional capacity
- **Heart Disease**- related to infracting of myocardium, blockage of pulmonary artery leading to cor-pulmonale

*There have been no studies that indicate any therapeutic benefit of bedrest.*

*Immobility for as little as 3 days in hospital setting has been associated with an increased risk of mortality*

*Most patients fail mobility because of an attempt to go from complete bedrest then OOB to chair with no smaller steps in between.*

**Interventions:** initiate a mobility plan

Complete bedrest orders should be rare and questioned for prolonged periods.

All patients should be considered for progressive mobility. Exclusions would include:
- Unstable fractures, comfort care, ICP monitoring, during CRRT or HD therapy
- Respiratory Instability
  - Fio2>0.60
  - PEEP>10
  - RR>35 bpm
  - Pressure control ventilation
- Cardiovascular instability
  - Hypotension
  - Tachycardia>130 bpm
  - Unstable cardiac rhythm
  - Multiple vasopressors
  - IABP (femoral sheaths)
  - Active bleeding

**Plan:** progress from least aggressive to most

**Step 1**
HOB elevated to 45°, evaluate patient tolerance

**Step 2**
HOB elevated to 45° and legs in dependant position (reverse Trendelenburg)

**Step 3**
HOB elevated to 60° and legs in dependant position (reverse Trendelenburg)

**Step 4**
Dangle legs with assist, feet touching floor is possible support the torso but encourage independence

**Step 5**
Stand patient at bedside with assist, patient has to bear weight & transfer to chair by pivoting or taking 1-2 small steps

**Step 6**
Walk with assistance using walker if necessary then walk independently if possible

**Progression to next step in the protocol is initiated when the patient tolerates a step for greater than 60 minutes with no cardiovascular or respiratory decompensation**

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