

Early Mobilization: Changing the Mindset

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BACKGROUND Staff in the surgical intensive care unit (SICU) had several concerns about mobilizing patients receiving mechanical ventilation.

OBJECTIVE To assess and improve the mindset of SICU staff toward early mobilization of patients receiving mechanical ventilation before, 6 months after, and 1 year after implementation of early mobilization.

METHODS The Plan-Do-Study-Act model was used to guide the planning, implementation, evaluation, and interventions to change the mindset and practice of SICU staff in mobilizing patients receiving mechanical ventilation. Interventions to overcome barriers to early mobilization included interdisciplinary collaboration, multimodal education, and operational changes. The mindset of the SICU staff toward early mobilization of patients receiving mechanical ventilation was assessed by using a survey questionnaire distributed 2 weeks before, 6 months after, and 1 year after implementation of early mobilization.

RESULTS The median score on 6 of 7 survey questions changed significantly from before, to 6 months after, to 1 year after implementation, indicating a change in the mindset of SICU staff toward early mobilization of patients receiving mechanical ventilation. The SICU staff agreed that most patients receiving mechanical ventilation are able to get out of bed safely with coordination among personnel and that early mobilization of intubated patients decreases length of stay and decreases occurrence of ventilator-associated pneumonia, deep vein thrombosis, and skin breakdown.

CONCLUSIONS SICU interdisciplinary team collaboration, multimodal education, and operational support contribute to removing staff bias against mobilizing patients receiving mechanical ventilation. (*Critical Care Nurse*. 2015;35[4]:e1-e7)

Patients in critical care settings are at high risk for immobility.^{1,2} Because of their high acuity, patients in intensive care units (ICUs) who require sedation face prolonged bed rest and immobility.² Patients' illness, the presence of invasive catheters, and the frequent need for mechanical ventilation present difficult challenges to the important goal of maintaining patients' mobility.^{1,3} Critically ill patients in ICUs who are not mobilized at an early phase during hospitalization experience persistent weakness, decreased quality of life, and alterations in neuropsychological function.¹⁻⁸ In a 1-year landmark

CE Continuing Education

This article has been designated for CE credit. A closed-book, multiple-choice examination follows this article, which tests your knowledge of the following objectives:

1. Identify benefits of early mobility in critically ill patients
2. Discuss use of a quality improvement model to improve outcomes in the critical care unit
3. Describe use of an interdisciplinary team to implement early mobility in the critical care unit

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study¹³ of patients discharged from ICUs, researchers reported a mean loss of 18% of body weight, a 4% to 5% loss of muscle strength in normally nourished patients, a decreased 6-minute walk distance, and only 49% of discharged patients having returned to work 1 year after discharge. However, increasing the duration and frequency of physical and occupational therapies in inpatients resulted in improved functional independence and better quality of life.¹⁴ An early mobilization protocol significantly reduced patients' total duration of mechanical ventilation and length of stay in the ICU.¹⁵

Safety Concerns When Mobilizing Patients

Furthermore, safety is a concern when mobilizing patients who are critically ill, including concerns about dislodgement of breathing tubes, nasogastric tubes, and rectal tubes.^{9,11} In 2 studies,^{7,9} a primary mobility team consisting of a primary nurse, a physical therapist, and a respiratory therapist helped ensure the safety of ambulating patients who had invasive catheters. A recent systematic review⁸

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of several studies^{9,16} demonstrated that early mobility of critically ill patients is safe and effective. In a prospective cohort study,¹⁶ 103 patients with respiratory failure who were receiving mechanical ventilation were mobilized by using a progressive mobility protocol. A total of 1449 activity events such as sitting on the bed, sitting in a chair,

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and ambulating were recorded, and adverse events (eg, extubation, falling to knees, catheter/tube removal, systolic blood pressure >200 mm Hg or <90 mm Hg, and oxygen saturation <80%) were reported. The results indicated that mobilizing patients receiving mechanical ventilation was safe, with fewer than 1% of patients experiencing adverse events, whereas 69% of patients had ambulated at the time of discharge from the respiratory ICU. Knowing the detrimental effects of prolonged immobility and the safety concerns when mobilizing patients, especially patients receiving mechanical ventilation support, a quality improvement project initiative was put in place in a postsurgical/trauma acute ICU.

Quality Improvement Project

The aim of the quality improvement project was to assess and change the mindset of the SICU staff toward early mobilization of patients receiving mechanical ventilation. The hospital is a quaternary-level academic teaching hospital with more than 900 beds, located in the northeastern United States. Under the leadership of an interdisciplinary team, the SICU has 18 beds for acute critically ill postsurgical patients, kidney transplant patients, and trauma level I patients. The team consisted of attending surgeons, intensivists, surgical fellows, surgical residents, registered nurses, respiratory therapists, patient care associates, support care associates, physical therapists, a dietitian, a social worker, and clerical support associates. This quality improvement project was qualified for exemption from the institutional review board. The SICU nurses were informed in writing that participation in this project was voluntary and that nonparticipation would not affect their performance evaluation. For this project, clear operational definitions of mindset and early progressive mobilization activity were developed. Mindset was defined as beliefs and concerns of the SICU staff nurses about mobilizing patients receiving mechanical ventilation. Early progressive mobilization activity was defined as a wide range of activities from getting patients out of bed and into a chair, dangling patients' legs at the side of the bed, having patients stand at the bedside, and ambulating patients who met the eligibility criteria.⁷

Plan-Do-Study-Act

The Plan, Do, Study, Act (PDSA) quality improvement model¹⁷ was used to guide the planning, interventions,

Table 1 Barriers to early mobilization in the surgical intensive care unit and interventions to overcome those barriers

Barriers	Interventions
1. Staff attitude	Created an early mobilization protocol (for barriers 1-6)
2. Lack of knowledge and training	Educated unit staff on the early mobilization eligibility protocol, sedation practice, and progressive mobilization activity protocol, and operational changes (for barriers 1-10)
3. Sedation practices	
4. Patient's pain and discomfort	Operational changes consisted of hiring of 2 full-time physical therapists by the department of rehabilitation, increasing the physical therapy treatment frequencies from twice a week to 5 times a week, purchasing new oral endotracheal tube securement device for safe mobilization of intubated patients, and purchasing of walkers with an intravenous pole and oxygen tank carrier (for barriers 8-10)
5. Hemodynamic instability	
6. Lack of physician referrals	
7. Safety of tubes, catheters, and wires	
8. Personnel and equipment resources	
9. Patient's size	
10. Time, valuing, and priority of mobilization	

evaluation, and reinterventions to assess and change the mindset of the SICU staff toward early mobilization of patients receiving mechanical ventilation. The PDSA model consisted of 4 stages: “Plan” identified an opportunity for improvement; “Do” tested the interventions; “Study” reviewed the results of data; and “Act” was implementing the reinterventions, which were based on the lessons learned from the initial interventions.

Plan

The SICU Collaborative Care Council, consisting of staff nurses, attending physicians, physician assistants, ancillary staff, and nursing leaders, put together survey questions that most effectively addressed nurses’ mindset toward mobilizing patients receiving mechanical ventilation. The mindset of the SICU staff was assessed by having them indicate the strength of their concerns and beliefs about mobilizing patients receiving mechanical ventilation 2 weeks before, 6 months after, and 1 year after the implementation of early mobilization. Staff nurses indicated their level of agreement with the following statements: (1) Most patients in the SICU are able to get out of bed. (2) It is safe to mobilize an orally intubated patient out of bed to a chair. (3) It is difficult to coordinate the personnel needed to complete a patient’s transfer to a chair. (4) The risk of self-extubation is increased when orally intubated patients are in a chair. (5) Early mobilization of intubated patients decreases length of stay and decreases incidents of ventilator-associated pneumonia, deep vein thrombosis, and skin breakdown. (6) The nurse is comfortable in mobilizing an orally intubated

patient out of bed to a chair. (7) Nursing staff share the responsibility for providing daily exercises to patients when appropriate. Included in the planning stage was an assessment of the barriers and appropriate interventions to change the mindset of the SICU staff toward mobilizing patients receiving mechanical ventilation. Recent studies^{4,9,18,19} on different barriers to mobilizing ICU patients validated the same barriers that the SICU staff encountered. Table 1 shows the barriers to early mobilization in the SICU and the appropriate interventions.

Do (Interventions)

The SICU interdisciplinary team adopted the eligibility criteria for early mobilization from the study by Needham and Korupolu,²⁰ which guided the nurses in assessing patients’ eligibility for early mobilization. Eligibility for early mobilization was determined by assessing for neurological stability (patient responds to verbal stimulation and follows verbal commands), respiratory stability (fraction of inspired oxygen <0.6; with positive end-expiratory pressure <10 cm H₂O), and circulatory stability (absence of orthostatic hypotension with low-dose vasopressor). The SICU interdisciplinary team adopted the progressive early mobility activity protocol used by Morris et al⁷ because this protocol resulted in a significant reduction in the length of stay for the mobility protocol group (5.5 days) than for the usual-care group (6.9 days) in that study. The early mobility activity protocol included 4 levels of activity therapy. The first level was designed for unconscious patients where passive range-of-motion exercises were performed on patients’

Table 2 Association between time and change in the mindset of staff from the surgical intensive care unit toward early mobilization of patients

Statement No. ^b	Median score ^a (lower quartile, upper quartile)			P
	Before implementation	6 months after implementation	1 year after implementation	
1	4 (3, 4)	2 (2, 3)	2.5 (2, 3.5)	<.001
2	2 (1, 3)	4 (3, 4)	3 (2.5, 4)	<.001
3	2 (1, 2)	4 (3, 4)	3 (2, 4)	<.001
4	2 (1, 2)	4 (3, 4)	3 (2, 4)	<.001
5	2 (2, 3)	2 (1, 3)	2 (1, 2)	.02
6	4 (4, 5)	3 (2, 4)	3 (2, 4)	<.001
7	2 (2, 3)	2 (2, 3)	2 (1, 2.5)	.14

^aThe scores for the responses were as follows: 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, 5 = strongly disagree.

^bStatements 1-7: (1) Most patients in the surgical intensive care unit are able to get out of bed. (2) It is safe to mobilize an orally intubated patient out of bed to a chair. (3) It is difficult to coordinate the personnel needed to complete a patient's transfer to a chair. (4) The risk of self-extubation is increased when orally intubated patients are in a chair. (5) Early mobilization of intubated patients decreases length of stay and decreases incidents of ventilator-associated pneumonia, deep vein thrombosis, and skin breakdown. (6) The nurse is comfortable in mobilizing the orally intubated patient out of bed to a chair. (7) Nursing staff share the responsibility for providing daily exercises to patients when appropriate.

upper and lower extremities 3 times a day. The second level was designed for patients who responded and followed commands where progressive active-assistive and active range-of-motion exercises were administered. The third and fourth levels were designed for patients who were alert and able to participate actively. A key feature of mobilization strategies in the critically ill for the fourth level was to have the patient get out of bed and into a chair, dangle legs at the side of the bed, stand at the bedside, and ambulate.⁷

Multimodal education that incorporated lecture, online education, just-in-time education, and discussion during unit briefs was designed to prepare each interdisciplinary team member to understand the adverse outcomes of immobility, the eligibility criteria for early mobilization including sedation practice, and the early mobilization activity protocol. The education of the SICU multidisciplinary team was conducted by the SICU nurse educator, physical therapist, respiratory therapist, and SICU attending physician at multiple times during the unit briefs, huddles, staff meetings, and meetings of the Collaborative Care Council. The SICU staff successfully completed the multimodal education by attendance at education sessions.

A survey questionnaire that used a 5-point Likert scale was used to assess the mindset of the SICU staff toward early mobilization of patients receiving mechanical ventilation, with a score of "1" being strongly agree

and "5" being strongly disagree with the 7 statements. The questionnaire was pilot tested on 5 SICU nurses to ensure the clarity and reliability of interpretations of the statements. The survey was distributed to the SICU staff nurses 2 weeks before, 6 months after, and 1 year after implementation of early mobilization of patients receiving mechanical ventilation.

Study Results

Of 56 staff nurses working in the SICU, 37 nurses responded to the survey 2 weeks before implementation, 34 nurses responded to the survey 6 months after implementation, and 36 nurses responded to the survey 1 year after implementation of early mobilization for patients receiving mechanical ventilation. The first, second, and third groups of SICU nurses who responded to the survey had very similar characteristics: 30 had a bachelor's degree in nursing, 7 had an associate's degree, they were from 24 to 55 years old (mean age, 35 years), they had a mean of 8 years of experience in critical care nursing, and all were full-time staff.

The results of the association between time (2 weeks before implementation, 6 months after implementation, and 1 year after implementation) and mindset of the SICU staff toward early mobilization are shown in Table 2. The median response to statement 1 changed significantly, with participants choosing to disagree before implementation and to agree after implementation of the early

mobility protocol. From before to 1 year after implementation, the responses changed from disagree to agree/neutral, respectively. For statements 2, 3, and 4, the median change in response changed significantly from before to 6 months after implementation and 1 year after implementation, with responses moving from agree to disagree to neutral, respectively. Although the median response to statement 5 was agree across all 3 time periods, the distribution of the responses changed significantly from agree to neutral before implementation to strongly agree to neutral at 6 months after implementation to strongly agree to agree at 1 year after implementation. The median response to question 6 changed from disagree before implementation to neutral at 6 months and 1 year after implementation. The response to question 7 did not change significantly from before to after implementation.

Act

Interventions to overcome the barriers (Table 1) to mobilizing patients receiving mechanical ventilation have improved the mindset of SICU staff toward early mobilization. These interventions are continually being implemented in the SICU. The early mobilization protocol has been added to the SICU's daily goal sheet, which is the paper tool used during bedside multidisciplinary patient care rounds. Beginning at 5 AM, the SICU attending/intensivist, primary nurse, and respiratory therapist assess patients for eligibility for mobilization. When patients are qualified for mobilization, the respiratory therapist initiates the ventilator weaning protocol, which expedites the first step in the early mobilization protocol. Nurses have realized the importance of mobilizing patients as they incorporate early mobilization in their plan of care.

To hardwire and sustain the early mobilization project, the early mobilization protocol has been added to the orientation curriculum of nurses, surgical residents, and fellows in the SICU. Every month, early mobilization statistics and practices are discussed in the SICU care improvement meetings. This quality improvement project has been presented to the Critical Care Service Improvement Coordinating Group and is currently being disseminated to other ICUs in this hospital.

Discussions and Implications

Overall, the results for 6 of the 7 statements on the survey showed a change in the mindset of SICU staff

toward early mobilization of patients receiving mechanical ventilation. The SICU staff agreed that most of the patients were able to get out of bed after identifying the barriers and appropriate interventions to mobilizing patients receiving mechanical ventilation. Creating an early mobilization protocol and educating the SICU staff on eligibility for the early mobilization protocol, sedation practice, and the progressive mobilization activity protocol have improved the attitude of staff toward mobilizing patients receiving mechanical ventilation. Multimodal staff education, which incorporates lecture, online education, just-in-time education, and discussion during unit briefs, has contributed to decreasing staff bias against early mobilization of SICU patients, and this result is consistent with the results reported by Morris et al,³ who used multimodal education to eliminate barriers to mobilization in ICUs. Involving the SICU mobilization team, consisting of physician, midlevel provider, respiratory therapist, physical therapist, staff nurses, and patients, in planning and implementing the early mobilization protocol may have helped in alleviating the challenge of coordinating the personnel needed to complete transfers of patients to chairs. The SICU staff agreed that it was safe to mobilize intubated patients, which was consistent with the results reported by Balas et al²¹ on mobilizing patients in ICUs. The risk of self-extubation was prevented by use of an endotracheal tube securement device and by having adequate staff assisting with the mobilization. The SICU staff agreed that early mobilization of patients receiving mechanical ventilation has decreased length of stay and the occurrence of ventilator-associated pneumonia, deep vein thrombosis, and skin breakdown. This change in the mindset may be related to the monthly meeting of the SICU service improvement coordinating group, where quality data such as length of stay and frequency of ventilator-associated pneumonia, deep vein thrombosis, and skin breakdown are presented and analyzed. In addition, monthly staff meetings and display of these quality data in the nurses' lounge may have contributed to better dissemination of results to the SICU staff. Responses to statement 7 on the

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survey showed that the SICU nurses did not agree that they share responsibility for providing daily exercises to patients when appropriate. This result may be related to the priority focus of staff in the SICU on hemodynamic stability, managing sepsis, and preserving organ function. Another reason may be related to lack of knowledge on providing passive exercises to patients and absence of a physician's order for nurses to provide daily exercises. A physical therapist covers the ICU, and nurses have been relying on the physical therapist to provide daily exercises for patients. Clearly, a daily mobilization goal for patients should be in place, and nurses and the physical therapist should be in partnership in coordinating the mobilization activities of these patients.

Summary

The SICU Collaborative Care Council has played a vital role in conceptualizing and implementing this quality improvement project. Interdisciplinary collaboration among the SICU team members makes it possible to tackle the important issue of early mobilization of critically ill patients in the SICU, as concluded by Bassett et al.⁶ Repetitive education and training of interdisciplinary staff is helpful in removing the barriers to implementing the early mobilization protocol, a finding validated by a recent study²¹ on an initiative for awakening and breathing coordination. Expertise from each discipline brings forth innovative ideas, such as the physical therapist's recommendation of purchasing mobilization support devices and hiring additional physical therapists. Referrals of patients to the physical therapy department have increased from 15 patients per month to 30 patients per month. Recommendations for future quality improvement projects or research include studying the effects of early mobilization of patients receiving mechanical ventilation in other patients from different types of ICUs, focusing on measurable outcomes such as length of stay; frequency of ventilator-associated pneumonia, pressure ulcers, deep venous thrombosis, catheter-associated urinary tract infections, and central catheter-associated bloodstream infections; use of sedation infusion agents; and readmission rates. [CCN](#)

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The SICU management team and leaders ensure that each member of the SICU team complies with protocols. Most of all, great appreciation goes to the SICU staff nurses, physical therapists, respiratory therapists, patient care associates, support care associates, physicians, and physician assistants who have been implementing the protocol as a team.

Financial Disclosures

None reported.



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CE Test Test ID C1542: Early Mobilization: Changing the Mindset

Learning objectives: 1. Identify benefits of early mobility in critically ill patients 2. Discuss use of a quality improvement model to improve outcomes in the critical care unit 3. Describe use of an interdisciplinary team to implement early mobility in the critical care unit

1. Which of the following is an immediate benefit of early mobility in critically ill patients?

- a. Weight loss
- b. Decreased duration of mechanical ventilation
- c. Postdischarge independence
- d. Postdischarge quality of life

2. Which of the following is the first step in a quality improvement project?

- a. Do
- b. Act
- c. Check
- d. Plan

3. Which of the following is an eligibility criterion for early mobilization?

- a. Ability to breath spontaneously
- b. Ability to maintain adequate blood pressure without use of vasopressors
- c. Ability to follow verbal commands
- d. Ability to verbalize pain level

4. Unconscious patients can benefit from early mobility consisting of which of the following?

- a. Elevation of the head of the bed
- b. Active range of motion exercises
- c. Dangling legs at the side of the bed
- d. Passive range of motion exercises

5. Which of the following is an important step of the quality improvement cycle?

- a. Test unproven interventions
- b. Check to determine if the intervention was successful
- c. Reprimand staff who do not adhere to the intervention
- d. Single out staff when the patient is not mobilized per protocol

6. Sustainability of a quality improvement project can be accomplished by which of the following?

- a. Sharing outcomes data
- b. Rewarding staff financially
- c. Recognizing staff who comply
- d. Publishing the results

7. Which of the following is an intervention to remove barriers to early mobilization in the intensive care unit?

- a. Purchasing new beds
- b. Increasing nurse/patient ratios
- c. Repetitive education and training of staff
- d. Restricting family visitation times

8. Which of the following is a contraindication for early mobility?

- a. Oral intubation
- b. Pain medication administration
- c. Dual chamber pacemaker
- d. Orthostatic hypotension with low-dose vasopressor

9. Which of the following is done to expedite the early mobilization protocol?

- a. Removing chest tubes
- b. Weaning vasopressors
- c. Initiating the ventilator weaning protocol
- d. Discontinuing enteral feeding

10. The quality improvement team has determined that implemented interventions are successful. Which of the following is the next step?

- a. Hardwire and sustain the project
- b. Plan new interventions
- c. Implement new interventions
- d. Check outcomes related to the interventions

11. Which of the following is used to evaluate the mindset of staff participating in a quality improvement project?

- a. Survey staff after the project
- b. Conduct random audits
- c. Survey staff before and after the project
- d. Conduct a qualitative study

12. Daily coordination of mobilization activities should occur collaboratively between which of the following?

- a. Clinical nurse and respiratory therapist
- b. Clinical nurse and physical therapist
- c. Clinical nurse and physician
- d. Clinical nurse and patient care technician

Test answers: Mark only one box for your answer to each question. You may photocopy this form.

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<input type="checkbox"/> easy <input type="checkbox"/> medium <input type="checkbox"/> difficult		
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