RELIEVE ICU-ASSOCIATED ILLNESS. REDUCE DELIRIUM. IMPROVE CRITICAL CARE.

Your guide to early mobility as an intervention

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Further, Together

An early mobility program may help patients in the ICU, where prolonged immobility is associated with negative outcomes — including critical illness and subsequent weakness.[1]

In fact, 25 percent of patients on mechanical ventilation for a week may experience ICU-acquired weakness.[2]

And immobilized ICU patients also may experience:

- Delirium
- Impaired exercise capacity
- Poorer functional outcomes and quality of life[3]

How immobility in the ICU affects patients

Immobilized ICU patients are often mechanically ventilated, confined to a bed, and sedated.[4]

All of which can contribute to the deconditioning of multiple organ systems,[4] including:

- Musculoskeletal
- Cardiovascular
- Circulatory[5]

What's more, critical-care patients at risk for immobility often require prolonged hospital stays — the average ICU length of stay (LOS) is 3.86 days.[4]

For many ICU patients, muscle atrophy — brought on by prolonged bed rest, sedation, and unavoidable immobilization — is a significant problem.[5,6] Both weakness and delirium acquired in the ICU are associated with poor long-term physical, functional, and cognitive outcomes.[7] In fact:

- Muscle wasting occurs early and rapidly during the first week of critical illness. It's more severe among those with multi-organ (rather than single-organ) failure.[8]
- Bed rest during critical illness may no longer represent a benign intervention; it's associated with catabolism, atrophy, and ICU-acquired weakness.[9]

Early mobilization is associated with improved outcomes. It may offer a safe intervention for many critically ill patients.[10]

Understanding delirium

Delirium occurs in 60 to 80 percent of mechanically ventilated ICU patients, and 20 to 50 percent of nonventilated patients.[11]

And it can result in enormous societal and financial burdens, due to:

- Increased mortality
- Prolonged ICU and hospital stays[11]

For ICU survivors, delirium — which represents an acute form of organ dysfunction — can contribute to long-term neuropsychological and functional deficits.[11] Fluctuating throughout the course of a day,[12] delirium manifests as a rapidly developing disturbance of both consciousness and cognition.[13]

Patients suffering from delirium may have increased risk of:

- Prolonged mechanical ventilation
- Catheter removal
- Self-extubation
- The need for physical restraints[13]

Testing of prevention strategies is warranted given the debilitating and persistent effects of ICU-acquired delirium and weakness.[14]

Intervention — including mobility — can reduce delirium

Researchers examined the relationship between delirium and implementing several protocols in 187 ICU patients.[14] They monitored:

- Prevalence and duration of delirium and coma
- Early mobilization
- Mortality
- Time to discharge
- Change in residence[14]

The results were impressive. Odds of delirium were reduced by nearly one half with awakening and breathing coordination, delirium monitoring and management, and early exercise and mobility.[14]

The same patients spent three more days breathing without assistance, with the following results:

- Increased odds of mobilizing out of bed at least once per day during an ICU stay[14]
- No significant differences noted in self-extubation or reintubation rates[14]

ICU-acquired weakness

Together, critical illness polyneuropathy (CIP) and critical illness myopathy (CIM) make up ICU-acquired weakness. CIP is a complication of severe trauma or infection (critical illness) and affects the peripheral nerves.[15] CIM typically occurs in ICU patients who have been treated with multiple drugs.[16]

Both CIP and CIM can cause muscle weakness and paresis in critically ill patients during their ICU stay.[17] Risk factors for ICU-acquired weakness include:

- High severity of illness upon admission
- Sepsis
- Multiple organ failure
- Hyperglycemia (high blood sugar)
- Prolonged immobilization[18]

Mobility and ventilator-associated pneumonia

Ventilator-associated pneumonia (VAP) occurs approximately 48 to 72 hours following endotracheal intubation.[19] VAP occurs in 9 to 27 percent of all mechanically ventilated patients, with the highest risk early in the course of hospitalization.[19]

Initiating the progressive upright mobility protocol (PUMP) correlated with a reduction in:

- Neurointensive-care-unit LOS
- Hospital LOS
- Healthcare-associated infections
- Ventilator-associated pneumonia[20]

The benefits of early mobility in the ICU

Early-mobility protocols in the ICU are becoming more widely adopted to:

- Mitigate patient suffering
- Improve patient outcomes both during and after care

Recent evidence-based critical care guidelines and care bundles feature sedation-management, delirium-monitoring, and mobility programs.[22] Yet implementing early-mobility protocol in the ICU remains highly variable.[22]

To improve outcomes and reduce costs for ICU patients across healthcare systems, research supports instituting planned, structured early-mobility programs because:[23]

- Early mobilization of critically ill patients is beneficial and can be incorporated into daily clinical practice.[3]
- Early passive, active, and combined progressive mobilization can be safely initiated in ICUs.[3]
- Adult patients receiving early mobilization have fewer ventilator-dependent days, shorter ICU and hospital stays, and better functional outcomes.[3]

How early mobility works

Early mobility is the application of physical activity within the first two to five days of critical illness or injury.[3]

Traditional physical therapy includes:

- Applying a passive range of movements
- Encouraging an active range of movements early in the ICU stay[10]

With early mobility, physical therapy is intensified and applied earlier to critically ill patients.[10] Early mobility includes specific interventions like:

- Actively mobilizing patients requiring mechanical ventilation
- Using novel techniques such as cycle ergometry and transcutaneous electrical muscle stimulation[10]

Early mobility is associated with decreased ICU and hospital stays.[1] Compared to patients receiving usual care, ICU patients receiving an early mobility protocol:

- Were out of bed earlier (5 days versus 11 days)
- Had therapy initiated more frequently in the ICU (91 percent versus 13 percent)
- Had similar low complication rates[1]

Barriers to early mobility programs

Major barriers to more widescale adoptions of early mobility include:

- Inadequate staff to deliver physical therapy
- Lack of equipment
- Concern regarding patient safety and physiological stability
- Sedation and ventilation practices
- Placement of vascular lines
- Lack of data on efficacy and health-economic evaluation to convince clinicians to apply early mobility.[10] Safety concerns can be remedied by appropriately training staff. [10]

Early mobility and mechanically ventilated critically ill patients

Researchers assessed daily interruption of sedation with physical and occupational therapy for 104 patients who were receiving mechanical ventilation in the ICU. An intervention group of 49 patients were assigned early exercise and mobilization (physical and occupational therapy) during periods of daily sedation interruption.[24] A control group of 55 patients were assigned daily sedation interruption with therapy as ordered by the primary care team.[24]

Results show that:

- Return to independent functional status at hospital discharge occurred in 59 percent of the intervention group versus 35 percent in the control group.[24]
- Patients in the intervention groups had shorter durations of delirium than the control group (two days versus four days)[24]
- Patients in the intervention group had more ventilator-free days than the control group (23.5 versus 21.1) during the 28-day followup.[24]

The ABCDEF bundle

This evidence-based guide can help in approaching the organizational changes needed to optimize ICU patient recovery and outcomes.[25]

The "E" element involves early mobility and exercise. It focuses on understanding the physical deficits that ICU survivors face and identifies strategies for successfully implementing early mobilization programs.[26]

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