**EARLY MOBILISATION IN ICU**

INTRODUCTION

INTRODUCTION

Intensive care, the highest level of medical treatment, is only given to very ill patients with potentially curable, fatal diseases. A critical illness or injury is one that "acutely affects one or more vital organ systems to the extent that there is a high possibility of imminent or life-threatening deterioration in the patient's condition," according to the Centers for Medicare & Medicaid Services.³ Critical care, also known as intensive care, is a multidisciplinary and interprofessional specialty designed especially for the management of patients who have already experienced organ failure or are at imminent risk of doing so. The ability to temporarily restore numerous failing organ systems, including the lungs, cardiovascular system, and kidneys, and to replace those functions if necessary, is what defines intensive care medicine. ¹

While it has been demonstrated that patients weaken, maybe as a result of their prolonged period of immobilization, it has been established that people recover from serious illnesses and leave an ICU facility on a global scale. ² Post-intensive care syndrome is the term used to describe the deterioration of physical, mental, and cognitive difficulties. Early patient mobility for critically sick patients is a secure technique for improving functional outcomes. Mobilization is the term for physical activity performed in the critical care unit at a level that may result in physiological changes. Early mobilization is the utilization of physical exercise from the second to the fifth day after the onset of a major illness or injury.¹

WHY EARLY MOBILISATION

For a sizable portion of ICU survivors, long-term care in the ICU is invariably fraught with challenges. Prolonged periods of inactivity have been associated with physical deconditioning, fatigue, loss of function, and a poor quality of life. A systematic study and meta-analysis found that early rehabilitation in the ICU may reduce the likelihood of developing intensive care unit-acquired frailty (ICUAW). Hemodynamic instability (n = 42; 20.5%) and patient non-responsiveness (n = 50; 24.4%) are allegedly the most frequent barriers to early mobilization. According to the study, there is a direct link between the type of ventilation and patient mobility away from the bed. ³

The ability to ambulate was linked to a higher likelihood of being discharged, according to a retrospective cohort analysis of patients who made it through a protracted ICU stay. evidencing the value of mobility training in settings offering long-term acute care. ¹

Below is a gist of the system-wise complications of prolonged immobility.

• In the respiratory system, it results in secretions being retained, decreased respiratory excursion, pneumonia, and atelectasis.

• Deep vein thrombosis, hypovolemia, embolization, orthostatic hypertension, and other cardiovascular problems.

• Reduced motility, constipation, and ileus are examples of gastrointestinal problems.

• Muscle shortening, weakness, and wasting are musculoskeletal problems that can result in joint contractures, functional denervation, demineralization of the bone, and heterotrophic ossification.

• Polyneuropathies impair the neurological system because there is less microcirculation at the nerve.

• Hyperglycemia with insulin resistance and catabolism are issues relating to the endocrine system.

• The integumentary system can result in pressure sores.

• The person's psychology is impacted, leading to sadness and delirium.

PHYSIOLOGICAL EFFECTS

The acute physiological effects of early mobilization are summarized below

|  |  |
| --- | --- |
| **SYSTEMS** | **PHYSIOLOGICAL EFFECTS** |
| Pulmonary System | * More regional ventilation
* More widespread regional diffusion
* Regional perfusion increased
* Boost the tidal volume
* Improve the effectiveness of the respiratory system
* Lower the resistance to airflow
* Boost flow rates
* Amplify zone 2 (Area of ventilation-perfusion matching)
* Alternately raise or lower the breathing rate
* Boost flow rates
* Boost the power and effectiveness of your cough
* Boost mucociliary clearance and transport
* Increased pulmonary immune factor function and distribution
 |
| Cardiovascular System | * Boosting the venous return, stroke volume, heart rate, and myocardial contractility
* Increase in coronary perfusion, heart rate, and stroke volume
* Raise the amount of blood in circulation
* Boost drainage from the chest tube
 |
| Peripheral Circulatory Effects | * Decrease of peripheral vascular resistance
* Increase blood flow
* Increase the rate at which oxygen is drawn from ancillary tissues.
 |
| Lymphatic System | * Enhancing pulmonary lymphatic flow
* Boost pulmonary lymph drainage
 |
| Hematologic System | * Lengthen the times that blood is circulated
* Lessen circulatory stagnation
 |
| Neurological System | * Boost arousal
* Amplify brain electrical activity
* Boost the encouragement to breathe
* Amplify the sympathetic response
* Enhance your postural reflexes
 |
| Endocrine System | * Increased catecholamine release
* Distribution, and deterioration
 |
| Genitourinary System | * Increase the glomerular filtration rate
* Increased urination
 |
| Gastrointestinal System | * Boost digestive motion
* Decrease constipation
 |
| Integumentary System | * Boost cutaneous blood flow to regulate body temperature
 |
| Multisystemic Effects | * Lessen the sedative and anesthetic effects
* Surgical risks for the cardiopulmonary system should be minimized
* Reduce the possibility of losing gravitational and exercise stimuli
 |

Prescription of Early Mobilization

Step 1-

• Knowing the genesis of the disorder or condition;

• Determining the causes of the oxygen transport deficits;

• Variables that are external to the patient's treatment; • Patient-related intrinsic factors

• Relative inertia

Step 2-

• Determining the precise type of exercise or mobilization needed to treat the deficiency of oxygen transport before calculating the demand for that mobilization.

Step 3-

* Tailoring the type of exercise or manner of mobilization to the patient's capacity to transport oxygen.

Step 4-

* Modify the dosage or intensity in accordance with the patient's safe oxygen transport restrictions.

Step 5-

 Incorporating the body positions with these exercises

* Thoracic mobility exercises
* ROM training (active, passive, and active-assisted),
* Synchronizing breathing with movement, and being supported while coughing by oneself or others are all recommended.

 Step 6-

* Monitor oxygen transfer and its indicators rather than using a predetermined period of time.

 Step 7-

 • Repeat this mobilization as frequently and safely as the subject or patient may tolerate.

 Step 8-

• The intensity of the mobilization stimulus can be increased as long as the patient can tolerate its effects while oxygen transport is used as a benchmark and vital signs are continuously monitored.

Early Mobilization Intervention

Every day of the week or five days a week can be used for early mobilization. These are some of the stated approaches that fall under the umbrella of early mobilization, active techniques are favored more than passive ones and contribute more to the prevention of complications:

* Range of motion, passive and active
* Active turning to the side
* Exercise in bed
* Sitting at the bedside²
* Moves back and forth between the chair and the bed
* Ambulation
* Resistance training
* Electrical Stimulation

REFERENCES-

1. Castro-Avila AC, Serón P, Fan E, Gaete M, Mickan S. [Effect of early rehabilitation during intensive care unit stay on functional status: systematic review and meta-analysis.](https://pubmed.ncbi.nlm.nih.gov/26132803/) PloS one. 2015;10(7):e0130722
2. Harrold ME, Salisbury LG, Webb SA, Allison GT, Australia and Scotland ICU Physiotherapy Collaboration. [Early mobilisation in intensive care units in Australia and Scotland: a prospective, observational cohort study examining mobilisation practices and barriers.](https://pubmed.ncbi.nlm.nih.gov/26370550/) Crit Care. 2015;19(1):336.
3. Anekwe DE, Biswas S, Bussières A, Spahija J. [Early Rehabilitation Reduces the Likelihood of Developing Intensive Care Unit-Acquired Weakness: A Systematic Review and Meta-Analysis](https://pubmed.ncbi.nlm.nih.gov/32135387/). Physiotherapy. 2020;107:1-10.
4. Gosselink R, Bott J, Johnson M, Dean E, Nava S, Norenberg M, et al. [Physiotherapy for adult patients with critical illness: recommendations of the European Respiratory Society and European Society of Intensive Care Medicine Task Force on Physiotherapy for Critically Ill Patients.](https://pubmed.ncbi.nlm.nih.gov/18283429/) Intensive Care Med. 2008;34(7):1188-1199.
5. Amidei C. [Mobilisation in critical care: a concept analysis.](https://pubmed.ncbi.nlm.nih.gov/22326102/%22%20%5Ct%20%22_blank) Intent Crit Care Nur. 2012;28(2):73-81
6. Tran DH, Maheshwari P, Nagaria Z, Patel HY, Verceles AC. [Ambulatory Status Is Associated With Successful Discharge Home in Survivors of Critical Illness.](https://pubmed.ncbi.nlm.nih.gov/32234767/) Respiratory Care. 2020; 65(8):1168-1173.
7. Tadyanemhandu C, van Aswegen H, Ntsiea V. [Organizational structures and early mobilization practices in South African public sector intensive care units—A cross‐sectional study](https://pubmed.ncbi.nlm.nih.gov/32141685/). Journal of Evaluation in Clinical Practice. 2021; 27(1):42-52
8. Stiller K. [Physiotherapy in intensive care: an updated systematic review](https://pubmed.ncbi.nlm.nih.gov/23722822/). Chest 2013;144(3):825–47