

**Implementing Early Physical Rehabilitation and Mobilisation in the ICU:  
Institutional, Clinician, and Patient Considerations**

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## **INTRODUCTION:**

Practice is evolving in response to increasing knowledge regarding the long-term impairments commonly experienced by ICU survivors[1,2]. There is growing interest in early physical rehabilitation and mobilisation in the intensive care unit (ICU). At present, randomized trials demonstrate mixed results, with beneficial outcomes occurring when rehabilitation is commenced within the first few days after ICU admission[3], and provided in the setting of light sedation, or perhaps as part of the Awakening and Breathing Coordination, Delirium monitoring/management, and Early exercise/mobility (ABCDE) bundle[4]. A recent meta-analysis demonstrated that early rehabilitation and mobilisation improves in-hospital functional outcomes, may reduce delirium, and improves days alive and out of hospital[3].

Pre-ICU health status and its impact on differential trajectories of recovery during and after the ICU stay are important considerations in determining response to rehabilitation. Pre-ICU health status, including consideration of comorbidities, frailty status, and premorbid physical functioning, in conjunction with new ICU-related physiological impairments, can impact patients' post-ICU outcomes. Support of physiological impairments (e.g. mechanical ventilation, vasopressors) and optimisation of pain, sedation/agitation and delirium status are important as these factors impact patients' engagement and capacity for rehabilitation in the ICU[5]. Despite potential benefits, implementation is challenging, particularly in resource-limited settings. This paper presents a guide for early physical rehabilitation and mobilisation, highlighting institution, clinician, and patient issues that are important for implementation (Figure 1).

## **INSTITUTIONAL AND CLINICIAN ISSUES:**

### **Identify and address modifiable barriers:**

Although rehabilitation and mobilisation is feasible, there are important barriers to implementation[6,7]. Such barriers include: institutional issues (e.g. staffing, consultation/referral requirements for rehabilitation clinicians), clinician issues (e.g., training and inter-professional communication), and patient issues (details below)[6,7]. Barriers are often modifiable, particularly at the institution and clinician level[6,7]. Careful assessment of the local setting, as part of a structured quality improvement (QI) approach, can assist in addressing barriers[8]. Barriers will differ across ICUs based on different patient case-mix, institutional and clinician-related resources, and geographic context. To help systematically identify barriers, standardized tools can be utilised, with regular re-evaluation of progress in overcoming barriers[9]. Notably, lack of financial support is often reported and, in some instances, can be addressed via creating a business case demonstrating cost savings and improved patient outcomes[10]. However in resource-limited settings, inter-professional teamwork (with focus on prioritisation of clinical activities and inter-professional daily goal setting) and integration of family into patient care are vital to achieving patient mobility.

### **Engage and evaluate with inter-professional team:**

Designated champions to support and advocate for rehabilitation, as part of daily clinical care, are essential[7,8]. Engagement activities can include patients returning to the ICU to share their story of post-ICU recovery-related challenges, comparing local data on patient mobility with peer hospitals and sharing local 'success stories'

of rehabilitation activities[8]. As part of a structured quality improvement approach, regular audit and feedback regarding progress is integral to the evolution of ICU mobility programs[8].

**Educate inter-professional team:**

Sharing the substantial available evidence regarding the safety and benefit of rehabilitation and mobilisation in the ICU[11,12] is an important aspect of education for all staff, with emphasis on using existing practical safety-related recommendations to aid in clinical decision-making for patient mobility[13]. Moreover, skills training within the inter-professional team (e.g., mobilisation techniques, and anticipating and reacting to potential risks/safety issues) can improve clinician confidence and capability.

**Establish communication and coordination plan for safety:**

Rehabilitation and mobilisation, especially as part of the ABCDE bundle, requires team communication and coordination[4]. Mobility-rounds or checklists can facilitate inter-professional discussions[6,7,14] and assist with prioritisation and coordination of the timing of interventions with other ICU procedures. Assessment of potential risks to patients and staff, and pre-planning regarding the required staff and equipment (e.g., walking aids, cardiac monitor) are essential for safe rehabilitation and mobilisation. One team member should be designated as a leader and specific team members' responsibilities should be clear. In particular, we recommend designating one person to be responsible for the airway and ensuring emergency airway equipment is available. Developing a back-up plan, prior to

mobilisation, is needed in case the patient deteriorates or fatigues, which may include specific strategies, such as immediate access to a bed or wheelchair[14].

## **PATIENT ISSUES:**

### **Assess functional capability and select interventions:**

Standardised evaluation of a patient's pre-ICU and current functional capability guides decisions regarding progression in rehabilitation. Such evaluation includes sedation/agitation and delirium status, comprehension of simple instructions, frailty, strength and physical functioning assessment (Figure 1). Based on current evidence, four physical functioning tools have robust measurement properties and clinical utility: ICU Mobility Scale, Functional Status Score for the ICU; Physical Function in the ICU test-scored, and Chelsea critical care physical assessment tool)[15]. At least one of these tools should be used as part of routine assessment in the ICU to monitor patient recovery and intervention responsiveness. Selecting the most appropriate tool will depend on available clinical resources/expertise, and reason for assessment. For example, the ICU mobility scale provides a brief evaluation of the highest level of mobility and can be assessed reliably by the bedside nurse[15]. In contrast, the other three recommended tools provide a more comprehensive evaluation of physical functioning and could be incorporated into routine physiotherapy/occupational therapy clinical assessments. Based on results of these assessments, rehabilitation and mobilisation interventions may be selected to target improvements in specific areas, such as strength, endurance, and balance.

### **Reinforce goals and evaluate progress:**

Communication and positive reinforcement, associated with setting and achieving dynamic individualised goals, is beneficial to patient and staff morale, and improved patient outcomes. Regular reassessment of functional capability is important to track progress and is suggested to be at least once weekly and at ICU discharge, with adequate communication and handover processes to the post-discharge team responsible for the patient.

### **FUTURE DIRECTIONS**

Future directions include: determining the optimal timing, type, duration, intensity and frequency of rehabilitation interventions, and evaluating the role of potential co-interventions, such as nutritional optimization[1,3]. Moreover, understanding trajectories of patient recovery and determining subgroups that may maximally benefit is valuable for optimal allocation of scarce resources and setting appropriate expectations for functional outcomes as part of decision-making in the ICU[1,6].

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**Figure 1: Approach to implementing physical rehabilitation and mobilisation in the ICU**

**Figure Legend:** This figure outlines relevant considerations at both the team- and patient-level to enable implementation of physical rehabilitation and mobilisation in the intensive care unit.

**Abbreviations:** ADLs, activities of daily living; CAM-ICU, Confusion Assessment Method for the ICU; CPAx, Chelsea Critical care physical assessment tool; CPOT, Critical Care Pain Observation Tool; FSS-ICU, Functional Status Score in the ICU; ICU, intensive care unit; IMS, ICU Mobility Scale; PFIT-s, Physical Function in ICU test-scored; RASS, Richmond Agitation and Sedation Scale.

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