PHYSICAL ACTIVITY and MOVEMENT/ MOBILISATION FOR THE CRITICAL CARE UNIT ADULT PATIENT

Cross references (including NSW Health/ SESIAHS policy directives)

Falls Prevention and Management for Older Patients in Acute and Sub-acute Care Facilities SESLHD PD248
ICCMU/ACI Physical Activity and Movement: A Guideline for Critically Ill Adults.2013
Bariatric ICU Patient - Nursing Management Considerations SGSHHS_CLIN242

1. What it is
A guide to safe mobilisation of the critical care patient and to achieve the bundle recommendations addressing awakening, delirium, ventilator management, and immobility

2. Risk rating
Low

3. Employees it applies to
Nurses, Physiotherapists and Medical staff employed at St George Hospital (STG) Intensive Care Units (ICU, CICU & ICU2).

4. When to use it
From admission to discharge for critically ill patients in Critical Care Units During daily assessment by Physiotherapist and Senior Nursing Staff

5. Who is responsible
Senior Physiotherapist
Director of Intensive Care Unit
Nurse Manager of Intensive Care Unit, NUM CICU, NUM ICU2
Hospital Executive - support in terms of management/budgetary maintenance

6. Process
Inactivity has a profound adverse effect on the brain, skin, skeletal muscle, pulmonary and cardiovascular systems\(^2, 3, 4, 7\). Delirium, pressure injuries, and muscular atrophy may occur in immobile patients and results in atelectasis, pneumonia, orthostatic hypotension and deep vein thrombosis\(^1, 5\).
It has been suggested that early activity and mobilisation of the intensive care patient may improve some functional and neuropsychiatric outcomes including ICU associated delirium\(^7, 8\). Mechanisms of critical illness polyneuropathy/myopathy (CIP) or Intensive Care Acquired Weakness (ICUAW) have been associated with an acute process of high illness severity requiring prolonged organ support and a period of protracted immobilisation\(^6\).
7. Definitions

7.1 Mobilisation – for the purposes of this Business rule mobilisation is defined as the moving from lying to sitting up in bed, sitting on the edge of the bed, sitting to standing, a standing transfer from the edge of the bed to a chair, marching on the spot or walking with or without a gait aid +/- assistance. At each of these stages of mobility there is active patient participation. See figure 1.9,10,11

7.2 Passive mobilisation – patient activity such as passive exercise in the bed, positioning upright in bed and mechanical transfer from bed to chair (via sling hoist).

7.3 Early Mobilisation – is the intensification and early application (within the first 2 to 5 days of critical illness) of the physical therapy that is administered to critically ill patients”.6

For further definitions of terms throughout this document, see Glossary in APPENDIX 3

Figure 1 The 4 stage process

Adapted model Balas et al 2012
8. Mobilisation assessment

1. Patients are assessed by the Medical and Senior Nursing staff upon admission to the unit or 24 hours thereof; those who are not eligible are reassessed during daily rounds by the Senior Physiotherapist and Senior Nursing staff in consultation with Medical Staff. See point 7 & 8

2. Physiotherapist to patient ratio should be 1:7.5 (ICU1), 1:10 (ICU2), 1:5 (CICU) (see Table 1 for physiotherapist ratios for safe mobilisation and prior to mobilisation. This is based upon the European Society of Intensive Care Medicine Working Group on Quality Improvement Recommendations: operational Guidelines for Allied Health Professional pertaining specifically to Physiotherapists23).

3. The physiotherapist assessment may include a manual muscle test; this will be documented in patient notes.

4. Each eligible patient is encouraged to be mobile at least once a day

5. Patients progress through the 4 stage process embarking on the highest level of physical activity they can tolerate.

6. Prior to mobilisation consider the following precautions/contraindications:
   - Where appropriate, spinal clearance must be documented, then the prescribed device fitted
   - Suspected DVT/PE
   - If Hb <70 & HCT >30% then ensure supplemental oxygen and good cardiac output. If cardiac history need Hb > 85
   - Suspected /confirmed fracture/ligamentous or joint instability before immobilisation and written mobility orders by Neuro/Ortho registrar and Plastics (especially SSG/muscle flaps)
   - Extreme confusion/agitation/aggression/anxiety
   - Epidural with motor involvement. Bromage > 2
   - Unstable blood pressure MAP <65mmHg
   - Systolic < 90 & MAP >120mmHg
   - Respiratory distress (RR >45 breaths)8 or high oxygen requirements (P/F ratio <250)8
   - Unstable BSL ,<3.5 or > 20
   - HR > 140 bpm or arrhythmias
   - Acute wound dehiscence
   - Excessive weight not able to be managed safely e.g. >120 kg
   - Temperature >38° Celsius

7. Prior to mobilisation (out of bed) the Ontario Modified Stratify (OMS) falls assessment must be carried out and documented on the clinical information system (CIS) by the Senior Physiotherapist. Emergency Department (ED) Nursing staff will document the OMS falls assessment for patients >65 years age admitted via the ED.

8. An activity mobility assessment chart must be completed by the RN caring for the patient, with consultation with the physiotherapist as soon as assessment for appropriate mobilisation has been made, and every 24 hours.

9. Ensure the patient is kept informed about what is going to happen and when. Clear, concise and calm instructions will ensure patient confidence and the overall safety of the mobilisation.

10. A risk assessment of the task to mobilise must be carried out prior to mobilisation moment to identify:
• number and safety needs of the staff required
• appropriate time according to medical and nursing staff availability in the unit
• whether the patient is deemed Bariatric. See CLBR Nursing Management ‘Considerations in the Bariatric ICU Patient within St George Hospital’
• mandatory infusions and ventilator equipment required and a nurse primarily responsible for the patients airway if intubated.
• consider availability of any lifting equipment in anticipation of falls to the floor
• patient on a ventilator can be walked at the bedside
• a plan for the manual handling task - how to achieve the move, time required, the use of lifters, slings, lateral transfer, and chair.
• refer to the STG ICU risk assessment (RA) and safe work procedures (SWP) for transferring a patient from bed to chair
• MUST meet the criteria for mobilisation see APPENDIX 1.

Table 1 Physiotherapist to patient ratio

<table>
<thead>
<tr>
<th>Intensive Care Unit</th>
<th>Weekdays</th>
<th>Weekend</th>
</tr>
</thead>
<tbody>
<tr>
<td>08.00 - 16.30</td>
<td>Mon - Fri 1 : 7.5</td>
<td>1:20*</td>
</tr>
<tr>
<td>16.30 - 22.00</td>
<td>Mon - Fri 1 for whole hospital</td>
<td>1 for whole hospital*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intensive Care Unit 2</th>
<th>Weekdays</th>
<th>Weekend</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 – 16.30 Mon – Fri</td>
<td>1:10</td>
<td>1 for whole hospital*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cardiac Intensive Care Unit</th>
<th>Weekdays</th>
<th>Weekend</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 – 16.30 Mon – Fri</td>
<td>1.5</td>
<td>1 for whole hospital*</td>
</tr>
</tbody>
</table>

*Mobilisation may be included as weekend/allocated day off (ADO) treatment as deemed necessary by the Physiotherapist completing the weekend/ADO ISBAR handover sheet.

9. Criteria to consider ceasing mobilisation intervention 3, 13, 14, 15

• Patient Mean Arterial pressure (MAP) <65 or>120 or <10mmHg lower than normal systolic or diastolic in renal patients3
• Heart rate < 50 or > 140/min and/or new arrhythmias developed (including frequent ventricular ectopics or new onset atrial fibrillation)3
• Pt requiring > 5 ug/minute Nor/Adrenaline (or equivalent vasopressor/inotrope)
• FiO2 > 0.6 with PaO2 < 70mmHg
• PEEP > 8cmH20
• Patient suffers a drop in SaO2 of > than or equal to 10% below their resting SaO2 or if SaO2<85%
• Respiratory rate < 5 or >35 breaths per minute
• Systolic blood pressure >180 mmHg
• Patient temp >38 degrees
• Marked ventilator dysynchrony
• Patient distress
• Patient complaint of new onset chest pain/ Concern for myocardial ischemia
• Concern for airway device integrity
• Patient suffers a fall during transfer to the chair or walking
• Endotracheal tube removal
• Patient is drowsy, uncooperative or unable to follow commands/instructions
• Patient has suffered an acute clinical deterioration (e.g. requiring reintubation) or an acute bout of sepsis
• Patient became pale and sweaty and/or the patient specifically requested to stop due to feeling acutely unwell

NOTE: If unsure of above criteria please consult with Senior Nursing and/or Medical Staff

10. Documentation of mobility and physical activity
• For the use of monitoring and documentation for mobilisation of the critically ill adult patient at the St George Hospital the following should be documented in the patient notes
  o The highest level of activity using the TEAM mobility Scale ICU. See appendix 2
  o Number of staff assisting/required
  o Equipment used (complete Manual Handling care plan)
  o Duration of activity
  o Complications with mobilising the patient or reason for ceasing mobilisation intervention
  o Patient Richmond, Agitation, Sedation Score (RASS), and other relevant criteria e.g. pain
  o A serious adverse event (see section 13) must be documented in notes, IIMS and Medical Officer examination and documentation of event and actions taken

11. Audit and outcome measures
To evaluate mobilisation in ICU, practice could be audited by the following methods below.
• It has been suggested that measures of physical function should be categorised into four types of end points.
• These four endpoints can be used to reflect proof of concept or other potential practice changing studies.
• The four categories are:
  o A single numerical score that evaluates a specific physical function, such as strength or walking distance
  o A hierarchical validated scale that measures some aspect of physical function (e.g. mobility: sit, stand, walk or highest level of physical activity) e.g. TEAM mobility scale ICU
  o A composite measure that measures the ability to perform multidimensional physical activities such as
    ▪ Short to medium term end points: Functional Independence Measure (FIM), Functional Status Score (FSS- ICU), Physical Function ICU Test (PFIT)
    ▪ Long term end points: Barthel Index and Katz ADL scale
  o A measure of the patient's perception of his or her physical function (SF -36)
The first 2 categories may assist with evaluating a mobilisation practise within the ICU the second 2 categories may be used to assess whether an intervention has a measurable effect more relevant to medium and long term outcomes.
• Annual point prevalence using – monthly collection of Highest Level of activity data comparing SGH ICU data to Level 6 ICU Australian benchmark data.

12. Serious adverse events
• The following events are mandatory reporting in the IIMS database
  o A fall
  o Extubation
Other serious adverse events requiring mandatory documentation in the patient notes include:
  o Accidental removal of any invasive drains/tubes
13. Infection and prevention

- A risk assessment to identify the risk of contamination and mucosal or conjunctival splash injuries during physical and mobilisation activities must be carried out prior to the mobilisation intervention. Personal Protective Equipment (PPE), (including goggles/face shield/gloves and gown/apron) as per NSW 2007 Infection Control Policy are to be worn according to this risk assessment
- The 5 Moments of Hand Hygiene are to be adhered to
- Equipment utilized for each patient, to reduce the risk of microbial transmission must be cleaned as per the NSW Infection Control Policy and ASA Standard 4187 prior to and following use

*NSW Health Infection Control Policy PD2007*

*Australian and New Zealand Standards for disinfect and sterilisation*

http://www.gobookee.net/get_book.php

14. Workplace Health & Safety Manual Handling

- A risk assessment must be carried out before a mobilisation intervention as per section 8 point 10.
- The existence of a register of staff signed-off in the task specific risk assessment and safe work procedures
- SWP can be found on the CIS under “ICU nurse procedure manual”
- If staff identify a new risk during a mobilisation intervention, ensure that they alert the Nurse Manager/Nurse Unit Manager of the unit.

15. Compliance evaluation

<table>
<thead>
<tr>
<th>Q1: What RASS score is required prior to mobilisation assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: -1 - +1</td>
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<table>
<thead>
<tr>
<th>Q2: What is one criteria for ceasing a mobilisation moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Endotracheal tube removal</td>
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<table>
<thead>
<tr>
<th>Q3: What is one criteria for documenting a serious adverse event</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Sustained SBP &lt; 90 mmHg with MAP &lt; 60 mmHg</td>
</tr>
<tr>
<td>• Evaluation of a patient activity and mobilisation program should occur following implementation, with regular audits for compliance conducted as a component of the Unit's routine quality improvement program</td>
</tr>
<tr>
<td>• Other e.g. Audit Plan Point prevalence using the TEAM mobility scale ICU</td>
</tr>
</tbody>
</table>

16. Keywords

Physical activity, mobilisation, risk assessment, criteria

17. External references

2. Cheung AM, Tansey CM, Tomlinson G et al. Two year outcomes, health
care use and costs in survivors of ARDS. American Journal of Respiratory Critical Care medicine 2006;174:538 – 544
7. Hodgson CL et al Development Of a Mobility Scale for the Use in a Mutlicentre Australia and New Zealand Trial of Early Activity and Mobilisation in ICU Am J Respir Crit Care Med 2013 Abstract
8. ICCMU/ACI Physical Activity and Movement: A Guideline for Critically Ill Adults,2013
APPENDIX 1: Criteria for mobilisation

**REVIEW MEDICAL BACKGROUND**
- Past medical history or recent symptoms of cardiovascular/respiratory dysfunction
- Medications which may affect a response to mobilisation
- Previous level of mobility and exercise function
- RASS -1 + 1

**IS THERE SUFFICIENT CARDIOVASCULAR RESERVE?**
- ECG normal (i.e. no evidence of MI or new arrhythmia)
- MAP > 85 and < 120, HR < 140 bpm.
- Other major cardiac conditions excluded (see parameters for considering causing mobilisation)

**NO**
- Deferral mobilisation or discuss with senior physiotherapist or medical staff

**UNSURE**
- Discuss with senior physiotherapist or medical staff

**YES**
- Deferral mobilisation or discuss with senior physiotherapist or medical staff

**IS THERE SUFFICIENT RESPIRATORY RESERVE?**
- Respiratory pattern satisfactory
- Mechanical ventilation able to be maintained during treatment

**NO**
- Deferral mobilisation or discuss with senior physiotherapist or medical staff

**UNSURE**
- Discuss with senior physiotherapist or medical staff

**YES**
- Deferral mobilisation or discuss with senior physiotherapist or medical staff

**ARE THERE PRECAUTIONS OR UNFAVOURABLE FACTORS TO MOBILISING?**
- Suspected DVT/PE
- If Hb < 70 & HCT > 30% than arrange supplemental oxygen and good Cardiac output. If cardiac history need Hb > 85
- Suspected/confirmed fracture before immobilisation and written mobility orders by Neuro/Ortho registrars and Plastics (especially SSG/muscle flaps)
- Extreme confusion/agitation/aggression/anxiety
- Epideral with motor involvement. Bromage > 2
- Unstable blood pressure MAP < 85
- Systolic < 90 & MAP > 120
- Respiratory distress (RR > 45 breaths) or high C02 requirements (P/F ratio < 250)
- Unstable BSL < 2.5 or > 20
- HR > 140 bpm or arrhythmias
- Acute wound dehiscence
- Excessive weight not able to be managed safely
- Temperature > 38

**NO**

**YES**
- Deferral mobilisation or discuss with senior physiotherapist or medical staff

**SELECT APPROPRIATE MODE AND INTENSITY OF MOBILISATION, MONITORING EQUIPMENT AND PROCEED**
APPENDIX 2: TEAM Mobility Scale ICU

Physio Documentation of Activity
Highest level of activity Daily record
1 = nothing (lying in bed)
2 = sitting in bed, exercises in bed
3 = passively moved to chair (no standing)
4 = sitting over edge of bed
5 = standing or sit to stand practice
6 = transferring bed to chair (active, WB)
7 = marching on spot (at bedside)
8 = walking with assistance of 2 or more people
9 = walking with assistance of 1 person
10 = walking independently with gait aid
11 = walking independently without gait aid

Weighted Kappa 0.92 (0.85-0.99) *18

APPENDIX 3: Glossary

Arrhythmia
An irregular heartbeat or abnormal rhythm.

Critical illness polymyopathy
Critical illness polymyopathy is a syndrome of widespread muscle weakness which can develop in critically ill patients receiving intensive care.

Critical illness polyneuropathy
Defined as a predominantly motor axonal dysfunction in critically ill patients.

Dyspnoea
Shortness of breath, breathlessness, laboured breathing, to the point of discomfort or distress.

FiO₂
Fraction of inspired oxygen

HR
Heart rate

Hypoxaemia
Subnormal oxygenation of arterial blood

MAP
Mean arterial pressure

MRO
Multi resistant organism

MV
Mechanical ventilation

NGT
Nasogastric tube

P/F Ratio
The PF ratio is PaO₂/FiO₂ and is a means of describing the severity of pulmonary dysfunction of ventilated patients in ICU

PPE
Personal protective equipment

RR
Respiratory rate

SBP
Systolic blood pressure

SOEOB
Sitting on the edge of the bed

SOOB
Sitting out of bed

SpO₂
Peripheral oxygen saturations

Tachypnoea
Rapid breathing