



Let's get physical

Theory and practice of early rehabilitation on critical care

Laura Breach
ACPRC PRO
Critical Care Clinical Specialist
Physiotherapist

Helen Sanger
ACPRC Newsletter Editor
Advanced Physiotherapist
Critical Care



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move differently

Effects of critical illness

- Nutritional
- Respiratory
- Swallowing/speech
- Psychological
- Cardiovascular
- Reduced mobility

Effects of critical illness

- **ICUAW**

- **Myopathy** – particularly with sepsis due to proteolysis
- **Peripheral neuropathy** – peroneal nerve neuropathy causes foot drop in 3% of patients in ITU
- **Critical illness polyneuropathy** – incidence of more than 1/3 in patients with LOS > 7 days (Latronico et al, 2011)
- Delayed recovery in ICU
- Mechanically ventilated for up to five times longer
- Increased ICU and hospital length of stay
- Increased mortality

Effects of immobility

- Decline in muscle strength of minimum 1–1.5% a day
 - Postural muscles atrophy more quickly
- Contractures
- Disuse atrophy of respiratory muscles
 - Significant diaphragm atrophy from 18-69 hours of complete diaphragm inactivity on mechanical ventilation
- Risk of blood clots
- Loss of bone density
 - Osteoporosis peaks at 4-6 weeks, approx.
 - 40% loss in 12 weeks when non-weightbearing
- Pressure ulcers

Long-term effects

- Persistent functional disability demonstrated over 1 year following discharge in ARDS patients (Herridge et al 2003)
- Prolonged ventilation associated with impaired HRQoL up to 3 years after discharge, even when patients are living independently at home (Combes et al 2003)
- After ARDS – 27% PTSD, 46% depression, 44% anxiety (Huang et al, 2016)

Critical Care Rehabilitation

2000: Comprehensive critical care (White paper)

2002: Critical care program (AHP and HCS advisory group)

2005: Quality critical care, beyond comprehensive critical care

2009: NICE CG83 Rehabilitation after critical illness in adults

2013: ICS/FICM Standards for Intensive Care Units

2015: GPICS

2017: NICE QS158 Rehabilitation after critical illness in adults

NICE QS158

1. Rehabilitation goals
2. Transfer from critical care to a general ward
3. Information on discharge from hospital
4. Follow-up after critical care discharge

Critical Care Rehabilitation

- Patients need to be challenged if they are going to progress.

To become an expert at a skill, 10,000 hours of practise are required.

If you practise for 5hrs/day for a whole year:

$$5 \times 365 = 1825\text{hrs}$$

To achieve 10,000h, you would need to practise at the same rate (5hrs/day) for about 5.5 years!

- How often and for how long do we see our patients and how much practise do they do?

Critical Care Rehabilitation

“Early mobilization of patients receiving mechanical ventilation was uncommon. More than 50% of patients discharged from the ICU had developed ICU-acquired weakness, which was associated with death between ICU discharge and day-90”

(TEAM study, 2015)

When Should We Mobilise Patients?

- Muscle breakdown may start within 24-48hrs
(Hodgson et al, 2015)
- Sitting on edge of bed when cardiovascularly stable
- Out of bed when cardiovascularly stable and ETT tolerant or a tracheostomy in situ
- Marching/pedals if stable but unable to come off monitoring
- Mobilise if stable and able to come off monitoring/portable monitoring available

TryCYCLE (Kho, 2016)

- Safety and feasibility of in bed cycling.
 - 33-patient prospective cohort study
 - In a 21-bed adult academic medical-surgical ICU
- Cycling began a median of **3 days** after ICU admission
- Of 205 total cycling sessions:
 - 150 were during invasive MV
 - 6 with vasopressors
 - 77 with sedative or analgesic infusions
 - 4 during dialysis
- Only 2% of sessions stopped, no adverse events

Rehab and ventilated patients

- Rehabilitation is key to weaning a patient from ventilation successfully and first time (Chiang et al 2000)
- Upper limb strength is directly correlated to respiratory muscle strength (O'Donnell et al 1998)
- Timing rehabilitation with weaning
 - Rehab and weaning plans
 - Patients may need increased ventilatory support or oxygen to rehab
 - Use specialist equipment (lay-flat chairs, bed pedals) to support

Aims of critical care rehabilitation

- Mobilise patients as early as possible (<72 hours)
- Facilitate weaning from MV
- Improve function by increasing strength and endurance

These combined can result in reduced length of stay in
critical care (McWilliams et al, 2014)

Breaking down barriers to early rehabilitation

- Sedation
- Ventilation
- Femoral lines
- ECMO
- Inotropes
- Delirium
- Equipment needs
- Fear!

ABCDE Approach

A wake

B reathing

C hoice of sedation

D elirium management

E arly mobility

Any questions?



References

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