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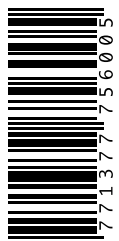
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# Implementation of early and structured rehabilitation in ICU

## The importance of multidisciplinary team working and communication

Early mobility has been shown to be both safe and feasible within critical care populations. When introduced, early mobilisation programmes are associated with an improvement in short-term outcomes and long-term recovery in critical care patients. Despite this, point prevalence surveys have shown rehabilitation levels remain low, and as such an increased focus has been placed on barriers to implementation. This article explores lessons learned from previous studies in this area to help guide clinicians in successful implementation, including key considerations for team working and key components in rehabilitation practice structure.

Patients admitted to ICU often experience significant weakness, with muscle loss found to be as high as 20% within the first seven days for those in multi-organ failure (Puthachary et al. 2013). The causes of this high rate of muscle loss are multifactorial, including factors such as sarcopenia from premorbid conditions, sepsis and prolonged immobility. When present, ICU-acquired weakness is associated with prolonged weaning from mechanical ventilation, longer ICU and hospital stays and increased mortality levels, as well as severe functional impairments and reduced pace and degree of recovery in ICU survivors (Griffiths and Hall 2010).

The evidence to support rehabilitation within critical care is growing, demonstrating rehabilitation to be both safe and feasible for critical care populations (Bailey et al. 2007; Umei et al. 2016). Early and structured rehabilitation has been proven effective in improving short-term outcomes and long-term recovery in critical care patients.

Specifically, early and structured rehabilitation programmes have been shown to decrease both ICU and hospital length of stay (LOS) (Morris et al. 2016; Needham et al. 2010; McWilliams et al. 2015), reduce the incidence and duration of delirium, as well as improve functional ability at critical care and hospital discharge (Schweikert et al. 2009).

Despite the growing evidence base for early rehabilitation, a number of recent point prevalence surveys have demonstrated levels of rehabilitation within critical care to be low, particularly whilst patients are receiving mechanical ventilation. A 3-day point prevalence survey of 38 ICUs in Australia and New Zealand found no patients requiring mechanical ventilation sitting out of bed or walking on the days in question (Berney et al. 2013). This was also the case in a similar study to assess mobility levels in German ICUs, which found only 4% of patients in ICU standing or walking (Nydahl et al. 2014). Additionally, more recent studies

looking at increased dosage or frequency of physiotherapy have failed to recreate the positive results previously seen (Denehy et al. 2013; Moss et al. 2016).

### Barriers to implementation

The cause of this lack of translation into practice has become a source of much interest, with findings suggesting the causes are multifactorial and vary between nations, regions or even ICUs within the same hospital. Recent research has therefore explored the specific barriers to implementation of early mobility programmes in ICU, finding that whilst barriers were multifactorial, important common themes were identified. Key themes included patient factors (i.e. instability and safety of mobilisation), clinician-related factors (knowledge of why and how to commence early rehabilitation), environmental influences (i.e. competing priorities and staff availability) and unit culture and environment (Costa et al. 2017; Parry et al. 2016). Taking a deeper

look at the evidence for early rehabilitation could provide some important answers for clinicians looking to implement similar interventions, with the need to promote open lines of communication and work towards achieving multidisciplinary culture change essential to improve outcomes (Sibilla et al. 2017).

A number of studies for early rehabilitation have used the quality improvement approach, which encompasses a variety of methods involving a team of individuals working towards a common goal or aim (U.S. Department of Health and Human Services Health Resources and Services Administration 2011). The key first stage to any quality improvement process emphasises the need to engage with key stakeholders to identify barriers and solutions for the project goals (Pronovost et al. 2008). As we have learned, the concept of implementing early mobilisation programmes is not a 'one size fits all' approach and the specific barriers to implementation may be unique to each individual ICU. Underpinning this engagement process was a focus on the importance of collaborative team working, ensuring everyone had a voice and was involved in the change process. This often involves the creation of team leaders and champions for rehabilitation practice from different healthcare professions. These champions are tasked with overseeing implementation, both within their own individual professions as well as within the wider multidisciplinary team, a process which ensures ongoing consistency with proposed service changes and which is crucial for team effectiveness. Team leaders play a key role in facilitating the development of shared objectives, overseeing decision making processes and guiding the team to reach their synergistic potential, whereby the collective effort surpasses the sum of individual contributions (Kozlowski et al. 2006).

### Overcoming barriers - safety

A number of perceived barriers to early mobilisation in the ICU are either directly or indirectly related to the safety of such activities, questioning the risks and potential for harm in mobilising patients who by their very nature are critically ill (Holdsworth et al.

2015). The argument against this is strong, with numerous studies exploring the safety of progressive mobility within ICU populations and more recently an expert consensus paper published by leading experts in the field on this very topic (Hodgson et al. 2014). This paper was supported by numerous studies assessing safety of mobilisation programmes within critical care, suggesting a low incidence of adverse events and helping to guide clinicians' decision making with when and how to proceed with early rehabilitation. In evaluations of current practice however, a number of perceived safety limitations to early mobilisation still exist with apparent ongoing concerns regarding the appropriateness of such interventions for patients with ongoing organ failure (McWilliams et al. 2016).

## Recent point prevalence surveys have demonstrated levels of rehabilitation within critical care to be low

One potential solution, which may be suitable to help decision making and guide practice, is through the use of early mobility protocols. There is strong evidence to support the use of protocols for other areas of care such as sedation minimisation and ventilator weaning (Girard et al. 2008; Kress et al. 2000; Ely et al. 1996). Expanding protocol use to include mobilisation seems possible, and excellent examples exist to help guide development (McWilliams et al. 2015; Engel et al. 2015; Pandharipande et al. 2010). The use of protocols for mobilisation may have a number of beneficial effects, helping to guide initiation and identify patients who are deemed sufficiently haemodynamically stable and ready to start more active mobilisation. Commencing mobilisation is however only the start of the rehabilitation journey and any protocol developed should also provide a structure or framework to empower healthcare professionals to progress activity and

ensure ongoing collaboration between team members.

### Overcoming barriers – structure and culture

A recent survey of current practice, including 951 ICUs from 4 countries, demonstrated significant international variation in the delivery of rehabilitation within critical care (Bakhru et al. 2016). Importantly however, the survey did provide useful insights into key components required to support early mobility programmes. The presence of a dedicated physiotherapist, multidisciplinary (MDT) team ward rounds and daily goal setting for rehabilitation were significantly associated with the presence of established early mobility practice within the ICUs surveyed. Once again, establishing an open forum for MDT communication is vital to support these processes. Previous findings have shown that in the absence of specific multidisciplinary care rounds healthcare professionals often prioritise information to reflect their own clinical roles, which may in turn lead to errors in communication or missed information that could be key to a patient's care (Miller et al. 2009). In an observational single-centre study, communication events between nurses and physicians comprised only 2% of observed activities in the ICU, but were associated with 37% of errors (Donchin et al. 1995). A similar finding was observed in a multicentre study where poor teamwork contributed to 32% of patient safety incidents (Pronovost et al. 2006).

Patient care rounds are therefore an important team activity where the patient's plan of care is discussed formally and tasks prioritised. There is evidence to support the initiation of patient care rounds in other areas of care, where they have been associated with positive patient outcomes. For example, implementation of daily multidisciplinary rounds by nursing staff, a physician and a respiratory therapist to review a checklist of ventilator bundle goals for each patient decreased the incidence of ventilator-associated pneumonia (VAP) from 1.5 per month to 0.5 per month in a study of surgical trauma ICU patients (Stone et al. 2011). Conversely, failure to develop consistent treatment goals

among ICU staff has been identified as a key source of intra-team conflict, which in turn is perceived to impact on outcomes such as decreased quality of patient care, staff burnout and wasted resources (Danjoux et al. 2009). Given the complex nature of early rehabilitation in patients with multi-organ failure, these rounds provide team members with the opportunity to discuss the patients' rehabilitation in the context of medical stability, any current plan for weaning of sedation and respiratory support, management of delirium and to highlight other team member tasks which may require completion (Bakhrū et al. 2016).

## Conclusion

The concept of implementing early mobilisation programmes is not a 'one size fits all' approach, but needs to be one of internal reflection and evaluation within multidisciplinary teams. A variety of factors needs to be considered, evaluated and then re-evaluated

for successful change to be introduced and maintained. The issue runs deeper than simply increasing the dose or duration of therapy, and clinicians need to explore the structure and culture within critical care

## concept of implementing early mobilisation programmes is not a 'one size fits all' approach

units to ensure effective and established behavioural change. Simple strategies such as daily MDT ward rounds, team meetings, collaborative inter-professional goal setting and visible goal targets are all excellent tools to support changes in practice. The development of shared goals is crucial for fostering

team commitment and a shared sense of identity which makes effective teamwork possible. This approach of team working and open communication has been replicated in a number of successful quality improvement initiatives of early mobilisation including our own, where individual centres evaluate their own barriers and generate solutions to overcome them with a consistent improvement in evaluated outcomes. ■

## Conflict of interest

David McWilliams declares that he has no conflict of interest.

## Abbreviations

ICU intensive care unit  
MDT multidisciplinary team

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