



Original article

Development of a neuro early mobilisation protocol for use in a neuroscience intensive care unit



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ABSTRACT

Objective: Through evaluation of the literature and working with a team of multidisciplinary healthcare providers, our objective was to refine an interprofessional Neuro Early Mobilisation Protocol for complex patients in the Neuroscience Intensive Care Unit.

Research methodology: Using the literature as a guide, key stakeholders, from multiple professions, designed and refined a Neuro Early Mobilisation Protocol.

Setting: This project took place at a large academic medical center in the southeast United States classified as both a Level I Trauma Center and Comprehensive Stroke Center.

Main outcome measures: Goals for protocol development were to: (1) simplify the protocol to allow for ease of use, (2) make the protocol more generalizable to the patient population cared for in the Neuroscience Intensive Care Unit, (3) receive feedback from those using the original protocol on ways to improve the protocol and (4) ensure patients were properly screened for inclusion and exclusion in the protocol.

Results: Using expert feedback and the evidence, an evidence-based Neuro Early Mobilisation Protocol was created for use with all patients in the Neuroscience Intensive Care Unit.

Conclusion: Future work will consist of protocol implementation and evaluation in order to increase patient mobilisation in the Neuroscience Intensive Care Unit.

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Implications for clinical practice

- Early mobilisation has been identified as feasible and safe in Medical Intensive Care Units, however there are few developed and tested protocols designed for the use in the Neuroscience Intensive Care Unit.
- Developing an evidence based protocol with interprofessional stakeholders is essential for successful implementation.
- Team driven protocol development leads to better understanding and use of a multidisciplinary Neuro Early Mobilisation Protocol.
- A nurse driven protocol can increase patient mobility in the Neuroscience Intensive Care Unit.

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Introduction

Each year, more than 5 million Americans are admitted to the Intensive Care Unit (ICU) (Society of Critical Care Medicine, 2015). The population of the United States continues to age as a result of the baby boomer generation and patients in the ICU are more critically ill than they were twenty years ago (Society of Critical Care Medicine, 2015). These patients typically require the assistance of a ventilator, cardiovascular support and invasive monitoring during their ICU course (Society of Critical Care Medicine, 2015). However, patients who once would have died in the ICU are now surviving their ICU admission due to advances in medical treatment, technology and care (Schweickert and Kress, 2011).

While in the ICU, many patients are kept immobile as their medical condition and associated treatments are viewed as non-conducive to early mobilisation (Engel et al., 2013b; Schweickert and Kress, 2011). Immobilisation, however, can lead to complications such as infection, long-term weakness, disability, as well as lengthened hospital stays (Bassett et al., 2012; Engel et al., 2013b; Morris et al., 2008; Schweickert and Kress, 2011; Titsworth et al., 2012). Several studies have determined that early mobilisation, when guided by protocols, can safely reduce the complications associated with immobility by reducing ICU patients' risk of infection, long term weakness, hospital length of stay (LOS) and can improve patients functional mobility in a cost effective manner (Bassett et al., 2012; Engel et al., 2013b; Morris et al., 2008; Needham et al., 2010; Olkowski and Shah, 2016; Schaller et al., 2016; Schweickert et al., 2009). Yet most ICUs, especially the Neuroscience Intensive Care Unit (NSICU), have been historically slow to implement early mobilisation as many of the initial studies were not conducted on patients with neurological injuries (Olkowski and Shah, 2016). Recent studies have started to identify those patients in the NSICU who may benefit from early mobilisation despite their complex medical conditions and provider concerns for safety during mobilisation (Engel et al., 2013a; Olkowski and Shah, 2016).

There are several reasons why patients may not be mobilized early in the ICU including: patient sedation, lack of teamwork, safety concerns, resources, time, a lack of understanding regarding the importance of early mobilisation and a need for change in the culture of the unit (Bakhrui et al., 2015; Engel et al., 2013a; Olkowski and Shah, 2016; Schweickert et al., 2009). Patients admitted to the NSICU often suffer from neurological injuries, which can affect their long-term functional outcome. Hence, immobilisation may further negatively impact the outcomes for this patient population, as it has become clear that immobilisation negatively impacts the outcomes for ICU patients in general (Kayambu et al., 2013). Patients in the NSICU are at risk for immobility and frequently require complex medical treatments, including ventilator assistance, as a result of neurological illness and/or damage and typically remain in the NSICU for two weeks or longer (Diringer et al., 2011; Hemphill et al., 2015). Additionally, patients in the NSICU often require special considerations related to hemodynamics, frequent neurological monitoring and fall risk assessments when implementing early mobilisation due to the complexity of their various disease processes (Kocan and Lietz, 2013; Olkowski and Shah, 2016). Patients in the NSICU do typically receive physical therapy (PT) and occupational therapy (OT) consults for early mobilisation. While research is limited, studies have shown no reduction in hospital LOS or mechanical ventilation use (Witcher et al., 2015). This may be due to the variation and consistency in the implementation of such therapy. However, there have been a few studies which have evaluated the safety, feasibility and benefits of using a nurse driven, multidisciplinary early mobilisation protocol in the NSICU (Klein et al., 2014; Mulkey et al., 2014; Titsworth et al., 2012). While there have been several protocols developed and implemented in various ICU settings, including the NSICU, there currently is not a single tested

and validated early mobilisation protocol designed for use in the NSICU (Bassett et al., 2012; Engel et al., 2013a,b; Klein et al., 2014; Kocan and Lietz, 2013; Morris et al., 2008; Titsworth et al., 2012; Zomorodi et al., 2012).

A previous protocol existed on our NSICU unit, but it was designed by a nurse for the purpose of mobilizing patients with hemorrhagic stroke only. Therefore, the purpose of this paper is to present the refinement of a protocol to include mobility criteria for all NSICU patients using an interprofessional approach by receiving input from multiple stakeholders.

Methods

Through evaluation of the literature and working with a team of multidisciplinary healthcare experts, our objective was to refine an interprofessional Neuro Early Mobilisation Protocol for the complex patients cared for in the NSICU. The experts developed criteria for inclusion and exclusion based on the literature and pathophysiology of the neurological patient. The goals for refining the original protocol were to: (1) simplify the protocol to allow for ease of use, (2) make the protocol more generalizable to the patient population cared for in the NSICU, (3) receive feedback from those using the original protocol on ways to improve the protocol and (4) ensure patients were properly screened for inclusion and exclusion in the protocol.

A literature review was conducted to explore examples of early mobilisation protocols. The literature review was conducted using both PubMed and Embase to search for relevant publications between January 2009 and January 2015. Search terms used for each included: *early ambulation*, *intensive care units*, *ICU*, and *stroke* as well as, *mobilisation*, *intensive care unit*, *ICU*, and *neuro**. Articles that were reviewed included those articles in English from the United States. All abstracts were reviewed for relevance and bibliographies were also reviewed for additional relevant content.

Setting

This project took place at a large academic medical center in the southeast United States classified as both a Level I Trauma Center and Comprehensive Stroke Center. The NSICU is a 16 bed ICU staffed by three Neurointensivists, a neurocritical care fellow, eight nurse practitioners, residents, and medical students who work closely alongside highly trained Critical Care nurses, nursing management, nursing assistants, PT, OT, and respiratory therapists (RT).

Ethical approval

The protocol refinement was reviewed by the Institutional Review Board and was considered not to be human research, thus a waiver was granted.

Protocol refinement process

Once the literature review was complete, input was sought from a group of multidisciplinary experts in order to gain feedback on how the original protocol could be improved for ease of use and expanded to all patients cared for in the NSICU. In order to ensure that expert representation for the protocol revision was obtained, a stakeholder analysis was conducted. The authors listed interdisciplinary members who had leadership roles in the institution, were involved in clinical practice decision making and were considered experts in their field through promotion qualifications of the organization (i.e. clinical ladder). This list was reviewed by the units' medical director and manager to confirm the best representation of multidisciplinary experts was achieved. These experts included the NSICU medical director, the NSICU manager and assistant manager,

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