



Provider Beliefs Regarding Early Mobilization in the Pediatric Intensive Care Unit



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ARTICLE INFO

Article history:

Received 22 November 2016

Revised 2 October 2017

Accepted 2 October 2017

Available online xxxx

ABSTRACT

Purpose: Critically ill patients are at risk for short and long term morbidity. Early mobilization (EM) of critically ill adults is safe and feasible, with improvement in outcomes. There are limited studies evaluating EM in pediatric critical care patients. Provider beliefs and concerns must be evaluated prior to EM implementation in the pediatric intensive care unit (PICU).

Design and Methods: A survey was distributed to PICU providers assessing beliefs and concerns with regards to EM of PICU patients.

Results: Seventy-one providers responded. Most staff believed EM would be beneficial. The largest perceived benefits were decreased length of both stay and mechanical ventilation. The largest perceived concerns were risk of both endotracheal tube and central venous catheter dislodgement. Surveyed clinicians felt significantly more comfortable mobilizing the oldest as compared to the youngest patients ($p < 0.0001$). Clinicians also felt significantly more comfortable mobilizing patients receiving invasive mechanical ventilation in the oldest as compared to the youngest patients ($p < 0.0001$).

Conclusion: There is clear benefit to the EM of adult ICU patients, with evidence supporting its safety and feasibility. As pediatric patients pose different challenges, it is imperative to understand provider concerns prior to the implementation of EM. Our research demonstrates similar concerns between adult and pediatric programs, with the addition of significant concern surrounding EM in very young children.

Practice Implications: Understanding pediatric specific concerns with regards to EM will allow for the proper development and implementation of pediatric EM programs, allowing us to assess safety, feasibility, and ultimately outcomes.

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Introduction

Patients with critical illness who survive their intensive care unit (ICU) stay are at risk for significant short and long term morbidity, including marked impairment in their physical and cognitive function (Jolley, Bunnell, & Hough, 2016; Knoester, Bronner, & Bos, 2008; Pandharipande, Girard, & Ely, 2014). This is likely multifactorial, resulting from a combination of both illness and iatrogenic factors, including prolonged periods of immobilization (Fan et al., 2014; Hermans & Van den Berghe, 2015).

There is growing evidence that demonstrates the benefits of early implementation of rehabilitation and mobility exercises, referred to as early mobilization (EM), in critical illness. Studies in adults have shown that progressive early rehabilitation is safe and feasible, with benefits ranging from improved muscle strength and functional abilities to reduction in ICU and hospital length of stay (Adler & Malone, 2012; Needham & Korupolu, 2010; Stiller, 2013). In particular, implementation of EM in adults has been shown to decrease the incidence of delirium (Needham & Korupolu, 2010). Successful EM programs have demonstrated the ability to overcome perceived patient and caregiver barriers including change in ICU culture, baseline knowledge deficits, staffing limitations, patient safety concerns, increased workload, and perceived pain (Dubb et al., 2016; Eakin, Ugabh, Arnautovic, Parker, & Needham, 2015; Hoyer, Brotman, Chan, & Needham, 2015). Because each ICU has its own distinctive culture, resources, patient population, and processes for delivering care, it is crucial to identify and understand

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the perceived barriers and benefits from the multidisciplinary team in order to implement a successful and sustainable program (Eakin et al., 2015). This is true for both adult and pediatric populations.

As is the case with adults, there is significant morbidity associated with a pediatric ICU (PICU) stay. In PICU survivors, effects on neurocognition, psychological health, quality of life, and functional outcomes have all been reported (Hopkins, Choong, Zebuhr, & Kudchadkar, 2015; Knoester et al., 2008). Though few, studies evaluating the implementation of EM in pediatrics have shown that it is both safe and feasible. They have demonstrated benefits including increased involvement of rehabilitative services in the care of critically ill patients, increased range of motion, and decreased length of stay (LOS) (Abdulsatar, Walker, Timmons, & Choong, 2013; Choong et al., 2013; Hollander et al., 2014; Jacobs, Salman, Cotton, Lyons, & Brilli, 2001; Wieczorek et al., 2016).

In contrast to EM in adults, there is added complexity introduced by pediatric patients with respect to age, cognitive maturity, and sedation needs that further complicates the implementation of EM. One Canadian study surveyed pediatric providers and found results that mirrored those in adult providers, with safety concerns, conflicting views about patient suitability, slow recognition of appropriate patients, and limited staffing (Choong et al., 2013). These barriers, plus the heterogeneous population of the PICU, have prevented the widespread creation and implementation of evidence-based guidelines (Wieczorek, Burke, Al-Harbi, & Kudchadkar, 2015).

The aim of this study was to assess the current knowledge of the multidisciplinary team in a PICU with regards to the definition of EM, perceived barriers, perceived benefits, and suitability of EM by age subgroups, with the ultimate goal of using this information to direct the development of an EM quality improvement project. For survey and data gathering purposes, EM was defined as the implementation of therapeutic interventions aimed at ambulating patients within 72 h of their PICU stay, including those patients on positive pressure and mechanical ventilation.

Methods

Study Setting/Participants

A 12-question survey was disseminated to 112 providers in a 23 bed medical/surgical PICU in a large metropolitan general hospital. The PICU is staffed by ten attending physicians, seven pediatric critical care fellows, seven physician assistants, 74 nurses, eight respiratory therapists, three occupational/physical therapists, two speech therapists, one child life specialist, and rotating pediatric and anesthesiology residents. As the goal of this survey was to ascertain the beliefs, concerns and barriers to implementation of EM in the PICU by those providers who spend the majority of their clinical time in the critical care setting, residents were excluded from the survey participation. This study was deemed exempt by the Weill Cornell Medical College Institutional Review Board.

Survey Development, Content and Administration

The survey was developed after extensive review of the adult EM literature. Questions were developed using previously published data on provider concerns and barriers to implementation from adult quality improvement studies (Dubb et al., 2016; Eakin et al., 2015; Hoyer et al., 2015; Needham & Korupolu, 2010). Questions were tailored to pediatric patients by the inclusion of age categories. The survey was approved by champions from each discipline prior to dissemination.

Providers were asked to identify their discipline as well as the amount of clinical time spent in the PICU setting. They were asked about their understanding of early mobilization and their feelings on the amount of rehabilitative services their PICU patients receive. Providers were then asked to choose their top five perceived benefits and top five perceived barriers to implementation of EM from a provided list.

To make this survey pediatric specific, providers were asked to rate whether they felt EM was safe in PICU patients by age category. These groups were chosen by a group of PICU physicians, nurses, and therapists based on the developmental abilities of children. The safety of EM in patients on non-invasive positive pressure ventilation (NIPPV) and in patients on invasive mechanical ventilation (via endotracheal tube or tracheostomy) was assessed separately. A copy of the survey can be found in the Appendix.

The final survey was distributed to all providers on the same day. Champions from each discipline sent out reminder emails over a two week period of time. The survey was sent out electronically and all responses were completely anonymous. Descriptive statistics and chi-squared tests were employed in the analysis of this survey.

Results

Surveys were sent to a total of 112 participants, of which 71 (63%) responded. Survey respondents by discipline were 10% attending MDs, 6% fellow MDs, 6% physician assistants, 61% registered nurses, and 17% rehabilitation therapists. The rehabilitation therapists included specialists in physical therapy, occupational therapy, speech therapy, respiratory therapy, and child life. Responses were greatest from the rehabilitation therapists, of which 86% replied. This was followed by 65% of nurses, 60% of MDs, and 57% of PAs. Of all respondents, 89% of providers spent >50% of their clinical time in the PICU.

All participants surveyed believed early mobilization to be beneficial for pediatric patients, with 93% expressing interest in the implementation of EM. Regarding current physical and occupational therapy practices, 73% of providers felt that the amount of services PICU patients currently receive are inadequate. Providers agreed that EM could include services ranging from sitting at the edge of the bed to marching in place.

With regards to the mobilization of mechanically ventilated patients, 97% of providers felt that given appropriate equipment and staffing, patients could safely receive physical and occupational therapy while in bed and 74% of providers felt that patients could be safely mobilized out of bed to chair. Fifty-one percent of providers felt that mechanically ventilated patients could be ambulated. When PICU patients were categorized into age groups, there were fewer providers that felt EM could be initiated in younger children, particularly in those young children on NIPPV or invasive mechanical ventilation (IMV). Using chi-square analysis, it was found that surveyed clinicians felt significantly more comfortable initiating mobilization in the oldest as compared to the youngest patients ($p < 0.0001$). Surveyed clinicians also felt significantly more comfortable with the mobilization of patients receiving IMV in the oldest as compared to the youngest patients ($p < 0.0001$) (Table 1).

Perceived Benefits

The majority of clinicians surveyed (87%) felt that decreased length of ICU stay was the biggest benefit of EM. This was followed by decreased length of mechanical ventilation (80%), and reduced incidence of delirium (71%) (Table 2).

Perceived Barriers

Within all respondents, risk of endotracheal tube dislodgement (71%), loss of indwelling central venous catheters (59%), and increased workload (48%) ranked highest amongst barriers to the implementation of an EM program. When broken down by discipline, risk of endotracheal tube dislodgement ranked highest amongst physicians (87%) and nurses (83%). It did not hold true for rehabilitation therapists, who ranked time constraints (67%) and increased staff workload (58%) as the largest barriers to the implementation of EM (Table 3).

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