REDUCING HOSPITAL LENGTH OF STAY FOR ADULT CRITICAL CARE PATIENTS BY UTILIZING A NURSE DRIVEN EARLY MOBILITY PROTOCOL

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BACKGROUND

Lack of early mobility in hospitalized adults in the intensive care unit (ICU) is associated with physical deconditioning, hospital associated delirium, and prolonged hospitalization (Fazio et al., 2016). These combined factors contribute increased risk for poor health outcomes such as falls, pressure ulcers, hospital acquired pneumonia, longer duration on mechanical ventilation, increased morbidity and potential mortality. Long-standing evidence shows that early mobility decreases such factors as previously mentioned, but bedrest still continues to be the standard of practice for many intensive care units (Hashem et al., 2016). There is a gap in the existing practice of keeping ICU patients on bedrest with current research, which promotes early mobility for this type of patient. The DNP prepared nurse can bridge the gap between research and clinical practice through an evidence-based nurse-driven early mobility protocol [NDEMP] (Chism, 2019).

According to Parry and Puthucheary (2015), prolonged bedrest and immobility can lead to rapid reduction in muscle mass and bone mineral density within the first week of bed rest. Studies focused on bed rest have demonstrated that up to 40% of muscle strength can be lost during the first week of bed rest due to reduction in muscle fiber size (Parry & Puthucheary, 2015). One human trial demonstrated a dramatic increase in muscle protein degradation of up to 160 % (Kourek et al., 2022). Other organ systems are also affected by bedrest and immobilization. Research conducted by Maggioni et al. (2018) has concluded that within 72 hours of patient inactivity there is central and peripheral cardiac deconditioning. This includes a 30% reduction in stroke volume, increase in resting heart rate and signs of orthostatic intolerance (Parry & Puthucheary, 2015).

PURPOSE AND HYPOTHESIS

The purpose of this quality improvement initiative of a nurse driven early mobility protocol is to introduce an evidence-based practice change in the intensive care unit with the aim of improving knowledge, attitude, and behavior that directly impact the factors associated with patient hospitalization length of stay. The goal is to evaluate whether an early nurse driven mobility protocol will reduce the combined factors that contribute to increased risk for poor health outcomes such as falls, pressure ulcers, hospital acquired pneumonia, longer duration on mechanical ventilation, increased morbidity and potential mortality, versus the current practice at the project site of not having an early nurse driven mobility protocol. Adult ICU patients are particularly vulnerable and at a higher risk for complications that could potentially prolong their hospitalization.

The project question is; will the ICU bedside nursing staff reduce hospital acquired complications thus reducing the patients' length of stay by using an evidence-based, nurse-driven early mobility protocol compared to the current practice of no early mobility in the ICU within a 4–5-week timeframe?

METHODS

Setting: Community hospital located in Central New York that has 144 acute-inpatient beds with a 12 bed ICU.

Sample: Twenty-eight subjects were included in data analysis based on inclusion criteria. Inclusion criteria included patients aged 18 and above admitted to the ICU with no limitation to those on mechanical ventilation by means of nasotracheal, endotracheal, or tracheal intubation, continuous renal replacement, left ventricular assist device, or extracorporeal membrane oxygenation.

Project Design: The procedure used for collecting data for the NDEMP QI project was to review 50 charts pre-implementation and 50 charts post-implementation with comparison of results. The host site informatics nurse was consulted to verify technological capabilities of chart review for specific data to include patients that meet mobility criteria as outlined in the early mobility algorithm. The statistical software suite SPSS was used to answer the clinical question. Descriptive statistics included a Wilcoxon Signed Ranks Test and Independent sample T-test.

RESULTS

Admission JH-HLM scores were subtracted from discharge JH-HLM scores to create a new variable, labeled as "change in JH-HLM score". A positive difference indicated improvement in functional status. The JH-HLM scores at admission ranged from 1 to 8 with a mean of 4.683 (SD = 2.36). Discharge JH-HLM scores ranged from 2 to 8 with a mean of 5.462 (SD=1.86). Despite the increase in JH-HLM score from admission to discharge, the Wilcoxon Signed Ranks test was nonsignificant (z = -1.22, p = .111). A p-value of less than 0.05 was required for statistical significance.

	n	Minimum	Maximum	*M*	*SD*
Admission	28	1	8.	4.683	2.36
Discharge	28	2	8.	5.462	1.86

A conceivable reason for lack of statistical significance can be attributed to an extreme outlier that had a decline in JH-HLM score by -3 points. After omitting the outlier, the average change in JH-HLM score from admission to discharge increased, with a decrease in standard deviation (M=6.357, SD= 1.496). Using a Wilcoxon Signed Ranks test comparing JH-HLM scores at admission and discharge, the data was statistically significant (z = -2.244, p =.012).

An independent sample T-test was used to compare the effect of early mobility on average length of stay in the ICU. Patients that met inclusion criteria for the nurse driven early mobility protocol had a slightly longer length of stay in the ICU (M = 6.54 + 3.45, range 2-13) when compared to those who could not participate in early mobility (M= 5.76 + 2.87, range 2-11). This was not statistically significant, with a p-value of 0.62.

The results of the data analysis failed to produce statistically significant results. This can be attributed to the sample size, as it was too small to detect clinically relevant differences due to inadequate statistical power.

Variable	Early Mobility (N=28)	No Early Mobility (N = 16)	P Value
Total Length of ICU Stay	(M = 6.54 + 3.45, range 2-13)	(M= 5.76 + 2.87, range 2-11)	0.62

CONCLUSIONS

The project's population consisted of 28 eligible patients based on inclusion criteria admitted to the ICU during implementation period of the quality improvement project. The bedside nurses assessed mobility status at admission to the ICU (baseline) and discharge (post implementation) using the JH-HLM tool. The clinical question examined whether implementation of the nurse driven early mobility protocol created by AHRQ would improve functional status and decrease hospital length of stay while in the ICU. Although data did not reflect statistical significance, the AHRQ nurse-driven early mobility protocol should be incorporated into daily nursing practice to reduce and prevent health-care related complications. Further research is necessary to address the limitations and barriers of implementation of such a quality improvement project.

BIBLIOGRAPHY

Stacy Salanger is a board certified Family nurse practitioner currently practicing in a hospitalist role with over 5 years of experience helping adult patients with complex medical conditions. Ms. Salanger is an Army Veteran who uses previous experience and education to provide holistic, high quality, patient centered care.

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