A Breath of Freedom: Innovative Nursing Approaches to Mechanical Ventilation Liberation

By Lynsey Boyd, BSN, Cameryn Lukawski, BSN, Delaney Barnard, BSN, and Bryanna Carter, BSN

Nurse-Led weaning is a meaningful evidence-based direction for weaning as opposed to traditional physician-led weaning programs. Our evidence-based project addresses the issue of mechanical ventilation weaning protocols, particularly focusing on the comparison between physician-led and nurse-led approaches. Mechanical ventilation is a critical intervention when used in the ICU setting to support patients with compromised respiratory function. However, navigating the weaning process is intricate but nurse-led weaning protocols have emerged as a potential solution to improve patient outcomes during the weaning process. Addressing this issue is important because it aims to enhance patient safety, expedite recovery, and optimize outcomes for individuals requiring mechanical ventilation, as well as address a critical gap in current practices.

Review of the Literature

Our review of the literature delineates the pivotal aspects of our study, focusing on the Adult Intensive Care Unit (ICU), specifically examining mechanical ventilation liberation and nurse-led weaning interventions. To maintain precision, we excluded pediatric populations and non-critical care units, allowing for a targeted analysis of our subject matter. A substantial portion of the literature reviews scrutinized the complication rates associated with mechanical ventilation, alongside the observed reductions in complications attributed to nurse-led mechanical ventilation weaning strategies (Sandur & Stoller, 1999). Numerous research efforts underscore both the complexity of the issue and the critical role nurses play in its management (Hirzallah, et al., 2019). Studies have delineated the risks associated with prolonged mechanical ventilation, including ventilator-associated complications, increased healthcare costs, and heightened mortality rates (Loss, et al., 2015). Conversely, evidence illuminates the benefits of nurse-led weaning protocols, showcasing reduced ventilator duration, enhanced patient comfort, and expedited recovery (Danckers, et al., 2013).

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Recommended Intervention

Evidence strongly supports the implementation of nurse-led weaning protocols to improve patient outcomes and optimize mechanical ventilation. By designating trained critical care nurses to conduct regular assessments of patients' readiness for weaning, addressing individualized patient needs, and implementing standardized criteria for assessing readiness, we can ensure a more efficient and effective weaning process. Ongoing education for nurses on evidence-based practices in mechanical ventilation weaning is essential to keep staff up to date with the latest protocols. Communication and collaboration among nurses, respiratory therapists, and physicians are vital to guarantee a cohesive approach to the weaning process. Establishing a systematic approach for continuous monitoring and evaluation of patients undergoing weaning, with regular reassessment of readiness criteria, will further enhance patient outcomes. Practice changes including adopting these evidence-based recommendations could lead to improved patient care and outcomes. Though challenges exist in the areas of implementation and measurement, a proactive approach in addressing challenges would guide recommended change.

Suggestions for Further Study

This evidence-based project conducted a systematic review to evaluate the potential efficacy of nurse-led weaning interventions in mechanical ventilation. Findings from this project strongly support the effectiveness of these strategies in reducing the duration of weaning and improving patient outcomes. Despite heterogeneity among studies, the evidence underscores the pivotal role of nurses in facilitating successful transitions from mechanical ventilation, leading to higher weaning success rates, reduced complications, and improved outcomes. However, the study also highlights the need for further research to clarify specific nurse-led interventions and refine protocols, considering the potential influence of a hospital environment on outcomes. Overall, the research reviewed and our work on this project provide valuable insights into the relevance of nurse-led extubation protocols in critical care settings and calls for continued investigation to optimize patient care and well-being. ■

References online:
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Lynsey Boyd, Cameryn Lukawski, Delaney Barnard, and Bryanna Carter graduated May 9, 2024, with a Bachelor of Science in Nursing Degrees from the Fran and Earl Ziegler College of Nursing at the University of Oklahoma Health Sciences. They will be starting their nursing careers in the trauma intensive care unit, medical intensive care unit, pediatrics, and OR. They chose the research nurse-led mechanical ventilation weaning in adult intensive care units because they felt that this topic would bring the medical teams together and utilize the resources at hand to enhance patient outcomes of mechanical ventilation liberation. They would like to thank Dr. Fisher for his wonderful guidance and help throughout their nursing school journey. Mark J. Fisher PhD, RN, CNE is an assistant professor at the Fran and Earl Ziegler College of Nursing at the University of Oklahoma Health Sciences Center.

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Nurse-Driven Initiatives to Reduce Supply Waste Produced in the Intensive Care Unit

By Ellee Edgar, BSN, Abigail Graves, BSN, Justin Tijerina, BSN, and Emma Wasson, BSN

Nurses are at the center of all patient care and as a result are consistently at the patient bedside. Nurses influence patient care while also having an opportunity to influence the cost of care through efficient care. Though healthcare costs are influenced by a myriad of factors, inefficiencies in resource management and supply waste are changeable by nurses. Solid waste and greenhouse gas emissions were shown to be 5.5 kg and 45 kg CO2-e per hospitalization, respectively (Prasad, et al., 2021). In a neuro ICU, total daily unit waste was over 200 pounds averaging just under 11 pounds per patient (Corbin, et al., 2022). Plastics derived from fossil fuels are widely used in healthcare to make many of the supplies used by nurses and when disposed can increase microplastics in our air, water, and soils (See, 2023). The sheer number of health care facilities and their patients can lead to excessive waste given the total number of healthcare providers who may lack awareness and engagement in waste-reduction behaviors. Decreases in disposable waste could begin with hospitals serving to guide more ethically sound and sustainable initiatives thus leading to a reduction in overall waste-related environmental impact (Ghersin, et al., 2020). Reduction of waste going to landfills, unnecessary production of greenhouse gases, and reduction of microplastics in intensive care units (ICUs) among other areas of waste in healthcare, are influenced by healthcare providers. Nurses have an opportunity to lead the healthcare industry toward more sustainable practices and reductions in the healthcare environmental footprint.

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Productive engagement of nurses in making the change to more sustainable practices can begin simply through increased awareness of wasteful practices (Morrow et al., 2013). Focused efforts in a specific area or waste stream can serve as a useful starting place. Waste streams include disposed waste, diverted waste, and avoided waste (Schenk, et al., 2023). Nurses are ideally positioned to avoid waste through their own efficient supply use and non-use along with their modeled actions and behaviors with other healthcare providers involved in patient care.

This evidence-based project addresses unnecessary waste in medical surgical ICUs by using bedside supply carts as opposed to general supply rooms. Excess supplies in a patient's room are typically deemed contaminated, may be opened by accident and not needed, or left only to expire before use – avoidable waste (Wohlford, et al., 2020). Use of bedside supply carts located in patient's rooms could greatly reduce waste through efficient use of supplies and reduced waste of unused yet contaminated supplies. Literature reviewed focused on managing waste in healthcare, specifically in medical-surgical ICUs, and locating sources of avoidable waste, such as single-use equipment, disposable packaging, and discarding unused supplies left in the patient's room after leaving the unit. For example, Cockerham et al. (2016) found supply changes led to impressive 45% to 80% decrease in stocked supplies on two different ICU bedside carts. Additionally, nursing and supporting staff found the cart turnover process to be faster and eas-