

PERFORMANCE IMPROVEMENT**Nursing & Health Sciences Research Journal**Journal Access: <https://scholarlycommons.baptisthealth.net/nhsrj/>**The Creation of a Critical Care Admission Pressure Injury Prevention Cart to Reduce Hospital-Acquired Pressure Injuries**

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Background: Critically ill and ventilated patients require prone position therapy and prolonged ventilator times placing them at risk for hospital acquired conditions, such as pressure injuries. With the emergence of the pandemic and additional surges, the rate of pressure injuries increased. The goal of this performance improvement initiative was to reduce hospital-acquired pressure injuries (HAPIs) related to COVID-19 on patients requiring Critical Care.

Methods: The Critical Care team created a Critical Care Admission Pressure Injury Prevention Cart containing preventative dressings for all pressure areas at risk.

Results: Prior to the implementation of the Critical Care Admission Pressure Injury Prevention Cart in January 2022, the Critical Care Unit reported fifty-six hospital acquired pressure injuries. From January 2022 through September 2022, there was a 98% reduction with only one acquired pressure injury identified. The cart was successful in the Critical Care Unit, therefore, it was also implemented in all high acuity areas of the hospital.

Conclusions: The cart initiative was developed by a multidisciplinary team, consisting of nursing, the wound and skin team, respiratory care, and leadership working together towards the goal of patient safety and pressure injury prevention.

Keywords: Hospital-acquired pressure injuries, HAPIs, critical care, COVID-19, pandemic, proning

INTRODUCTION

Patients' skin integrity and prevention of pressure injuries are of upmost importance for hospitals' Critical Care units. Patients with hospital acquired pressure injuries (HAPIs) have a higher acuity than average which increases the patients' length of stay and inpatient cost with the average cost of a HAPI being estimated at \$10,708 (Padula & Delarmente, 2019). With the emergence of the pandemic and additional surges, pressure injuries increased related to an increase in high acuity patients and prone position therapy.

Prone positioning is a method used to enhance oxygenation in acute respiratory distress syndrome (ARDS) patients who require mechanical ventilation with COVID-19 (Rahman et al., 2020). Evidence shows that prone positioning may prevent lung injuries caused by ventilators (Rahman et al., 2020).

The physiologic benefits of prone positioning include improved oxygenation, improved respiratory mechanics, reduction of atelectasis, facilitation of draining of secretions, and reduced ventilator associated lung injury (Byrne et al., 2020).

Prone positioning requires coordination between several healthcare team members with timed position changes. When patients are positioned in prone position, careful considerations need to be taken to prevent skin breakdown. Considerations include assessing all pressure points, ensuring patients are not lying on cables, catheters, or tubing that may induce HAPIs, rotating the head every 2 hours, and ensuring frequent alternation of the raised arm (Evidence Based Clinical Care, 2020). According to Rahman et al. (2020), considering the complications and benefits of prone position ventilation, positioning patients for no less than 12 hours per day is a safe technique in lowering the mortality rates in patients with ARDS.

In an effort to decrease the proning-related HAPI rate and create ease for the Critical Care nurses and respiratory therapists, the Critical Care staff created an innovative Critical Care Admission Pressure Injury Prevention Cart. The Critical Care team performed a literature search and reviewed evidence-based practice guidelines on pressure injury prevention, proning, and COVID-19. Pressure injury prevention is not a new concept for Critical Care units, however with the COVID-19 crisis, healthcare workers were dealing with critically sick patients on a whole new level (Pehrson, 2020). According to the literature, HAPIs are the most common complication related to prone positioning reported by researchers during the pre-pandemic period and during the COVID-19 pandemic (Team et al., 2021). Prone position places patients flat on their chest and face down putting different bony prominences at risk (Pehrson, 2020). According to Santos et al. (2020), a systematic review of literature found that patients in prone position are at 22 times greater risk of developing pressure injuries and a retrospective study found that 14% of 170 prone patients developed a pressure injury.

The cart was created to proactively place preventative dressings on patients prior to prone therapy and for all patients at risk for skin breakdown. The primary goal of this initiative was the reduction of HAPIs, which would consequentially decrease patients' hospital stay and reduce healthcare associated costs in the healthcare system (Team et al., 2021). Hospital acquired pressure injuries represent a major challenge in healthcare and represent adverse events considered preventable, which justifies the need for preventative measures to be implemented (Santos et al., 2020).

INTERVENTION

During the COVID-19 pandemic, the system Evidence Based Clinical Care (EBCC) team created pronation order sets for mechanically ventilated patients. Part of the order set included applying protective skin pads to the forehead, cheeks, chin, chest, shoulders, clavicles, abdomen, elbows, knees, and tops of feet. Our hospital's Critical Care has the highest acuity and the largest number of patients at risk for skin breakdown in the healthcare system. To maintain proper adherence to prone position protocols and HAPI prevention, the Critical Care team chose to create an admission cart to assist nurses with all the required dressings in one location.

The Critical Care Team met with the hospital wound and skin team working collaboratively to review preventative dressings inclusion on the cart. Additionally, two small working nurse groups were formed. One working group focused on organizing the location of the dressings within each drawer of the cart. This group also worked with the Central Supply Team to ensure proper par levels of supplies were available on the unit to restock the cart after each use. The second group worked collaboratively to create templates and inventory checklists as follows: Standardized Admission Checklist, Inventory Checklist, and Daily Log. The Standardized Admission Checklist consisted of a list of admission tasks and reminders for pressure injury prevention, which included the following: 1) thoroughly assessing the patient's skin, 2) admission pictures of the sacrum, heels, and wounds, 3) protective cream barrier and dressings, 4) offloading boots, 5) positioner pillows, 6) turning wedges, and 7) electronic record documentation including clear documentation of findings, goals, patient education, and the Braden Scale. The Standardized Admission Checklist also included a section of task reminders for addressing existing wounds identified upon admission (i.e., consult the wound and skin team; evaluate for specialty mattress, if indicated; and complete an incident report).

The Inventory Checklist was utilized to ensure documentation (i.e., charging) and timely replacement of consumed supplies. The Inventory Checklist provided itemization of supplies by drawer. Drawer one contained dressings for the sacrum, heels, and medium sized dressings for various areas of the body. Drawer two contained positioner pillows, barrier cream, and smaller sized dressings. Drawer three contained special-

ized boots to float the heels. Drawer four contained rulers, turning wedges, and a camera to take pictures.

The daily log was used to ensure the cart was properly stocked and ready for handoff to the next shift. The log was reviewed each shift and restocked by the nurses. The daily log followed the format of the itemized Inventory Checklist. The top of the cart contained a binder with all the forms. Upon arrival of new admissions, the nurses took the cart to the room, assisted with taking pictures of any wounds, provided education, ensured the Standardized Admission Checklist was completed, and obtained a patient label to be placed on the inventory checklist for charging and restocking. Once all the forms were completed, they were placed in the binder. Before change of shift, the nurses ensured the cart was fully stocked/locked and appropriate completion of all forms before handing off to the next shift. The wound care cart went live after nurses and patient care technicians (PCT) received training, which was provided during staff meetings, unit huddles, and one-to-one education by the Clinical Nurse Educator and the Wound and Skin nursing team. Nurses and PCTs expressed having all supplies in one location was helpful.

RESULTS

The Critical Care team implemented the admission cart in January of 2022. From January

2022 through September 2022, there were one hundred and sixty-three hospital acquired pressure injuries reported. In September, the Critical Care Unit reported one hospital acquired pressure injury, which represents a 98% reduction from January 2022 (Figure 1). This result led to expanded incorporation of an Admission Pressure Injury Prevention Cart across all high acuity patient care units throughout the hospital.

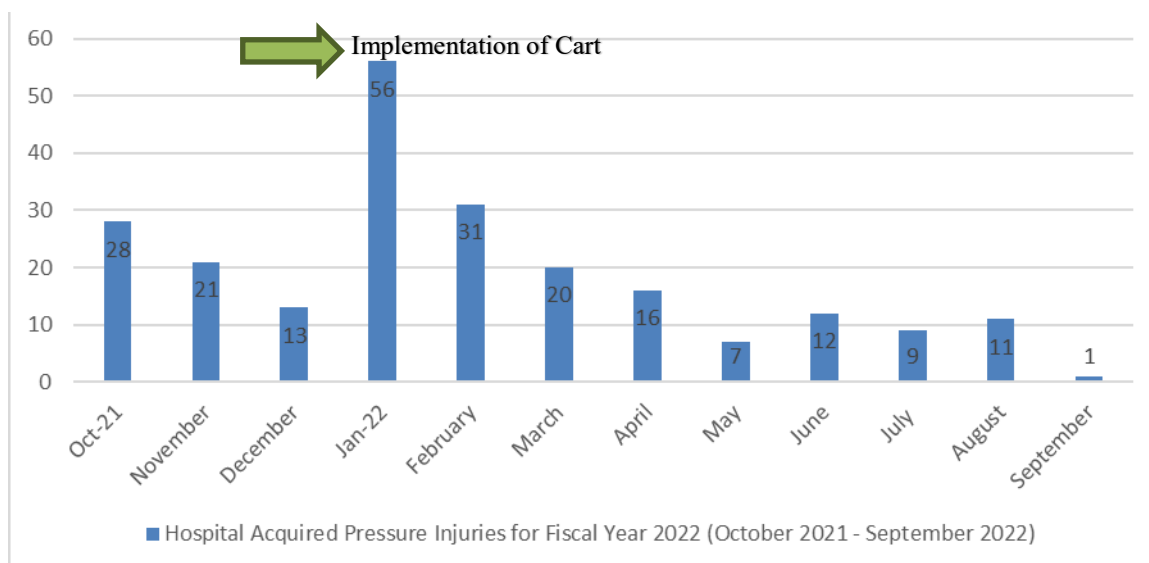
Reduction of HAPIs benefits patients and organizations. Management of HAPIs is costly. Studies show that pressure injury prevention is more cost-effective than treatment (Team et al., 2021). The organization will ultimately receive reimbursement from the Centers for Medicare and Medicaid (CMS) and will be publicly recognized for improvements in patient care quality. Consequently, patients will have decreased cost, decreased length of stay, and reduced risk of acquiring a hospital acquired condition (HAC) (IBM Watson Health, 2018).

DISCUSSION

The initial purpose of this initiative was to prevent HAPIs related to prone position therapy. Prior to positioning patients in prone position, the main recommendations include: completing a thorough skin assessment; using pressure redistribution devices to offload pressure on bony prominences; selecting the appropriate specialty mattress; ensuring endotracheal tube securing

Figure 1

Hospital Acquired Pressure Injuries in Critical Care



device is removed and secured with tape; and utilizing protective dressings (Team et al., 2021). Other interventions to prevent HAPIs include friction management by using lifts or slide sheets, regular repositioning, and moisture management (Frank, 2022). There is an increasing body of evidence supporting the use of prophylactic dressings to redistribute pressure and protect the skin from shear and friction damage (Cornish, 2017).

The Critical Care Admission Pressure Injury Prevention Cart became so successful with HAPI reduction, that the cart is being utilized for HAPI prevention in all high acuity patient care units, which included the pulmonary stepdown unit, neurology and cardiology stepdown, and specialty medical-surgical departments. These units also reported decreased HAPI rates.

CONCLUSION

The implementation of the Critical Care Admission Pressure Injury Prevention Cart served to prevent patients' skin breakdown and, thereby, the potential negative sequelae associated with HAPIs (i.e., psychosocial issues, pain, and stress) (Padula & Delarmente, 2019). It also contributed to COVID-19 patients' successful proning without further skin deterioration due to higher acuity. Successful proning reduces mortality and is instrumental to saving lives (Byrne et al., 2020). The Critical Care Admission Pressure Injury Prevention Cart is an innovative initiative created by a Critical Care Team of nurses to provide high-quality patient care.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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