

Quality Improvement Efforts to Prevent Hospital-Acquired Pressure Injuries in the Intensive Care Unit During COVID-19

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BACKGROUND

The onset of the coronavirus disease 2019 (COVID-19) pandemic has resulted in new challenges in the intensive care setting. The postural adjuvant therapy of prone positioning is used broadly to improve ventilation in patients with COVID-19.^{1,2} It is used for extended periods of 10 to 12 hours for maximum effectiveness, which can result in excess pressure on the face and bony prominences.² Prone positioning can further result in

tube and line displacement³ and potentially in device-associated pressure injury. It is well established that there is an increased risk of pressure injury as a result of prone positioning, as reported by Lucchini et al.⁴ The following outcomes story describes a quality improvement (QI) initiative in the intensive care setting to adhere to best practices for hospital-acquired pressure injury (HAPI) prevention.

METHODS

Clinical Setting: This QI initiative took place on an 8-bed intensive care unit (ICU) in a rural community hospital. **Root Cause Analysis:** A root cause analysis was conducted, owing to a prevalence of HAPI greater than benchmark prevalence, which identified several opportunities for improvement. As a result, evidence-based interventions were developed.

Interventions: The QI initiative included the following interventions:

- In addition to preexisting HAPI prevention program, tailored dietary consultations coordinated in collaboration with wound care personnel
- Prone positioning protocol developed to ensure appropriate offloading with standardized bed technology*
- Increased frequency of wound care rounding and hands-on clinical support

Compliance: Compliance with the QI interventions was ensured by spot checks and periodic auditing of best practices by nursing leadership.

Education: A strong emphasis was placed on caregiver education to ensure that best practices were practiced at the patient's bedside. These included the following:

- Appropriate, universal, facility-wide consensus on wound types, leading to improved identification of wound etiology
- Standardization of skincare products
- Decreasing the number of layers (aim for 2) underneath each patient
- Education on protocols and how to prevent device-associated injury
- Ensuring a clinical culture of safety whereby HAPI prevention is carefully considered

Collaboration: The prone positioning protocol was developed in collaboration with an interdisciplinary team consisting of hospitalists, pulmonologists, nursing leaders, nursing managers, and wound care specialists.

Communications: The occurrence of HAPIs, prevention strategies, and outcomes were added to regular reporting during daily morning administrative and leadership meetings.

Leadership and Team Buy-In: There was strong leadership support of this QI initiative and a commitment to ensure that the clinical culture was engaged and bought-in to QI interventions.

Prone protocol (short version)

Supply checklist:

- ✓ (1) Closed circuit suction setup
- ✓ (1) Mattress overlay
- ✓ (2) Clean bedsheets
- ✓ (1) Absorbent pad / Slide sheet
- ✓ (3) Pillows
- ✓ (1) Pack ECG electrodes

Prior to turn:

1. Multidisciplinary discussion regarding potential risks / benefits of proning.
2. Ensure adequate staff available to facilitate safe execution.
 - a. Minimum 5 people required (MD, RT, ≥3 nursing staff).
3. Remove all ECG electrodes, retape ET tube to appropriate side, ensure all lines secured appropriately.
4. Suction airway and preoxygenate with 100% fO₂.

Supine to Prone:

1. Team members perform "time out". Roles are established and direction of turn is determined.
2. MD at head of bed secures airway and is responsible for coordinating procedure.
3. Tuck arm closest to vent under buttock with palm facing anteriorly.
4. Place clean pad / slide sheet > bed sheet > mattress overlay on top of patient, leaving only head/neck exposed.
5. Roll the edges of the linens tightly together on both sides of patient, encasing them.
6. Move patient horizontally away from ventilator
7. At the MD's count, the patient should be turned laterally 90 degrees.
8. Turning team members pause and adjust hand positions.
9. At the MD's count, the patient is turned from lateral to prone toward the ventilator.
10. Ensure ETT remains in place and not kinked. Replace ECG electrodes.
11. Inflate mattress overlay and tuck corners where appropriate to provide offloading.
12. Raise arm on the side that patient's head is facing; Lower opposite arm along patient's side.
13. Place bed in reverse Trendelenburg position.
14. Alternate position of head / arms every 2-4 hours.

RESULTS

This QI initiative has been successful, resulting in no HAIs for an extended period (Figure 1). A cost-savings analysis was conducted on over 3000 admissions, which found a cost avoidance of \$417,300 (Figure 2).⁵ A secondary finding was a correlation between dietary consultation and HAI prevention. After implementation of the QI initiative, there was a 500% increase in dietary consultations, which correlated with an extended period with no HAIs (Figure 3).



Figure 1. HAI



Figure 2. HAI in Prone Patients



Figure 3. Dietary Consultations

CLINICAL IMPLICATIONS

The following clinical implications were realized as a result of this QI initiative:

- A culture of safety and universal buy-in at all levels are imperative for achieving success in these programs.
- Universal, facility-wide, interdisciplinary consensus on wound types and etiology can decrease the incidence of incorrectly classified wounds.
- When creating a new protocol (such as our prone positioning protocol), frequent rounding, bedside check-ins, and clinical support appeared to improve adherence and patient outcomes.

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