

# Dollars, Collaboration, and Pressure Injury Prevention (PIP): Saving Upwards of a Million by Achieving Zero



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## Problem

The incidence of hospital-acquired pressure injuries (HAPI) plateaued at a rate of 7.8% in two critical care units despite a prevention bundle which included risk and skin assessment, moisture management, and offloading. Notably, respiratory medical device-related pressure injuries increased to 3.7%.

Facility costs for HAPI treatment are high and likely to increase. As of 2016, 3 titles under the Affordable Care Act impose penalties for HAPI occurrences and/or incentives for low facility incidence.<sup>1</sup> At a facility expense ranging from \$500 to \$70,000 per pressure injury, an average incidence of two per month could potentially cost the hospital \$1.68 million annually.<sup>2</sup> The goal of this evidence-based quality improvement project was to determine if an interdisciplinary approach to utilizing prophylactic silicone foam dressings would reduce the incidence of sacral, heel, and respiratory medical device-related pressure injuries resulting in improved patient outcomes as well as cost savings for the facility.

## Setting

Two ten-bed critical care units with patients at high risk for developing pressure injuries.

## Procedure:

An interdisciplinary team was created and utilized the Plan-Do-Check-Act Quality Improvement Process to effect change. (See Figure A)

A review of clinical evidence indicated that one prophylactic dressing was backed by randomized controlled trials and thus was our choice for this intervention.<sup>2,3</sup> Inclusion parameters for high risk and application of prophylactic dressings were determined after a review of national guidelines.<sup>2</sup> (Tables 1 and 2)

Critical care nurses and respiratory therapists received education and/or demonstration on:

- Inclusion criteria, information graphic (see Tables 1 and 2), and dressing selection guide
- Braden Scale and correct scoring
- Impact of vasopressor medications on pressure injury development
- The dressing's preventive mode of action and proper application

Staff assessed patients using a guide developed by the team that listed inclusion criteria and appropriate dressing selection choice. (Figure B)

## Metrics

Critical care unit hospital-acquired pressure injury (HAPI) incidence rates from 4th quarter (2014) and 1st quarter (2015) were compared to HAPI's in critical care from 2nd, 3rd, and 4th quarters of 2015. (Table 3)

## Results

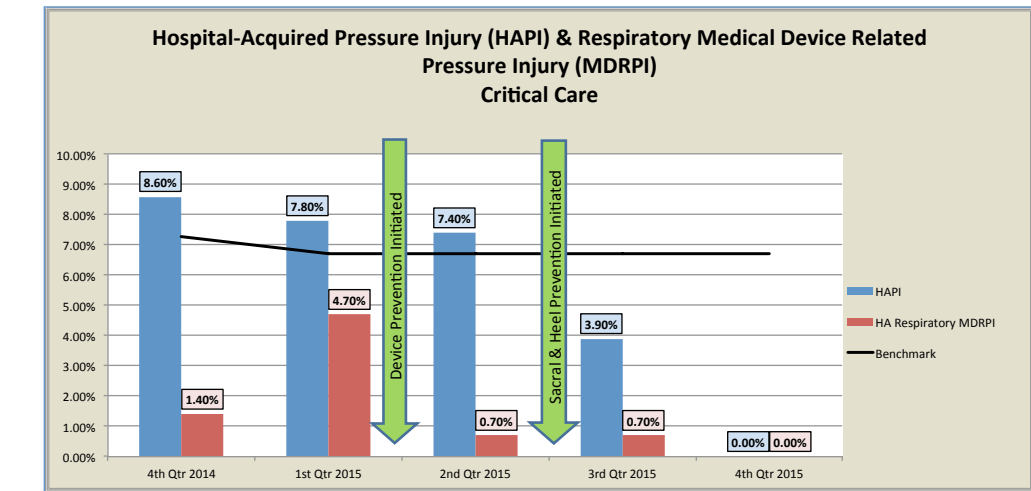
Critical care pressure injury incidence rate decreased quarterly, as each quality improvement phase was implemented. Prophylactic silicone foam dressings on the sacrum, heels and under respiratory medical devices, as an adjunct to the current pressure injury prevention (PIP) bundle, yielded a zero incidence rate for HAPI and Respiratory MDRPI in both units. Note: 2 heel pressure injuries developed on 1 patient during the 4th quarter of 2015 however, that patient did not receive the prophylactic dressing, so those injuries were excluded from the numbers reported.

Recommendation for modification of the pressure injury prevention protocol was submitted to, and accepted by the Shared Governance Councils. Recommendations included: an algorithm for utilization of prophylactic silicone foam dressings, specific interdisciplinary roles for preventive intervention, annual competency training and revision of clinical documentation templates to reflect recommended interventions.

**Table 4:** Potential hospital-specific cost per quarter based on the historical HAPI incidence in our critical care units

2014 4th quarter	2015 1st quarter	2015 2nd quarter	2015 3rd quarter	2015 4th quarter
\$6,000-\$840,000	\$5,500-\$770,000	\$5,500-\$770,000	\$2,500-\$350,000	ZERO

**Table 3:** Hospital-Acquired Pressure Injury: Incidence Rate Trend



**Future implications:** Expand the use of prophylactic dressings to prevent pressure injuries in other high risk areas discussed in clinical literature such as the perioperative environment and the emergency department.<sup>2,3</sup>

**Limitations:** We believe that some interventions, such as scoring of the Braden Scale, may have been implemented more consistently if we had developed the role of the skin champion on each shift.

## Conclusion

Staff education, implementation of evidenced-based practice including use of prophylactic silicone foam dressings, combined with a multidisciplinary approach decreased hospital-acquired pressure injuries in two critical care units, resulting in a potential cost savings of \$840,000 biannually.

(See Table 4)

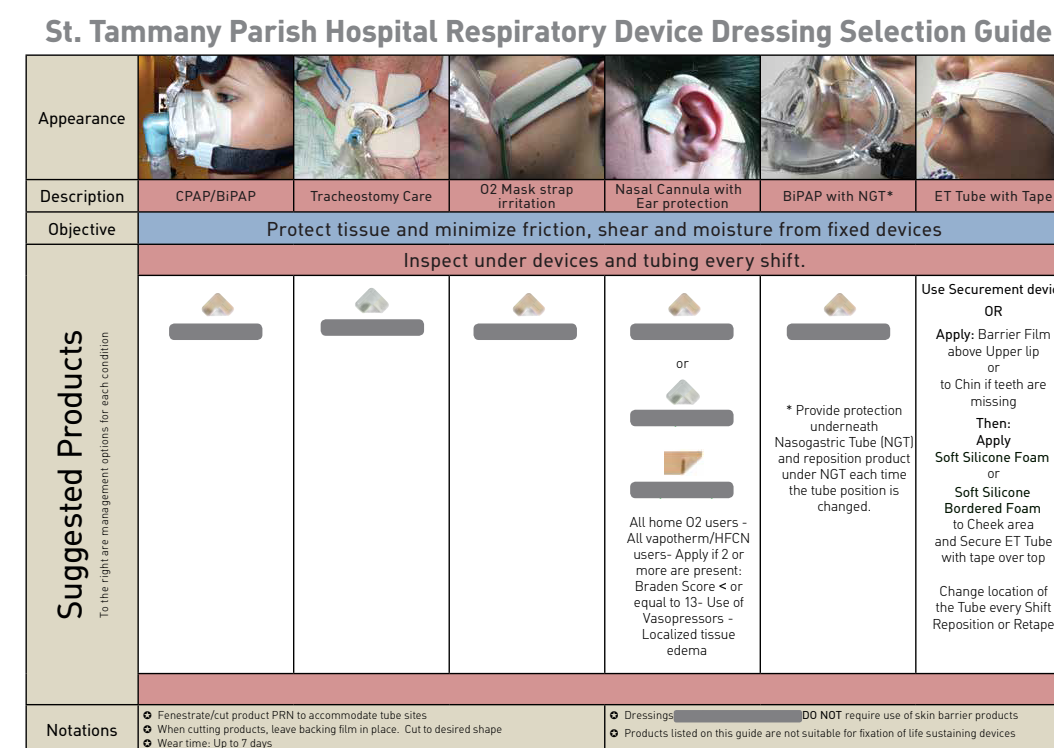
## Quick Facts

- National incidence of hospital-acquired pressure injuries: 4.5% of all admits<sup>4</sup>
  - 13% of critical care patients<sup>2</sup>
- Hospital-acquired medical device-related pressure injuries: 11.9%<sup>2</sup>
- Presence of a medical device increases the risk of pressure injury 2.4 times<sup>2</sup>

## Evolving Science

- Clinical literature highlights the role of shear force and tissue deformation in the development of pressure injury<sup>2</sup>
- Awareness of pressure injury under respiratory devices is increasing. Devices:
  - Are generally made of plastic causing increased microclimate
  - Require tight fixation to optimize oxygen delivery causing pressure
  - Often required for a prolonged period of time<sup>5</sup>
- The NPUAP 2014 Guidelines recommend using evidence-based interventions; one of which is the use of prophylactic dressings that decrease friction and reduce localized shear forces while managing microclimate<sup>2</sup>
- The ability to absorb moisture is particularly important beneath a device, tube or fixator<sup>6</sup>

**Figure B:** Respiratory Device Dressing Selection Guide



**St. Tammany Parish Hospital Respiratory Device Dressing Selection Guide**

Appearance	CPAP/BIPAP	Tracheostomy Care	O2 Mask strap irritation	Nasal Cannula with Ear protection	BIPAP with NGT*	ET Tube with Tape
Description	CPAP/BIPAP	Tracheostomy Care	O2 Mask strap irritation	Nasal Cannula with Ear protection	BIPAP with NGT*	ET Tube with Tape
Objective	Protect tissue and minimize friction, shear and moisture from fixed devices					
Suggested Products	Inspect under devices and tubing every shift.					
	Use Securement device OR Apply: Barrier Film above Upper lip or to Chin if teeth are missing or Apply: Soft Silicone Foam or Bordered Foam to Cheek area and Secure ET Tube with tape over top Change location of the Tube every Shift or Retape					
Notations	• Fenestrated/cut product P/N to accommodate tube sizes • When cutting products, leave backing firm in place. Cut to desired shape • Wear gloves 15-20 days		• Dressings <b>DO NOT</b> require use of skin barrier products • Products listed on this guide are not suitable for fixation of the sustaining devices			

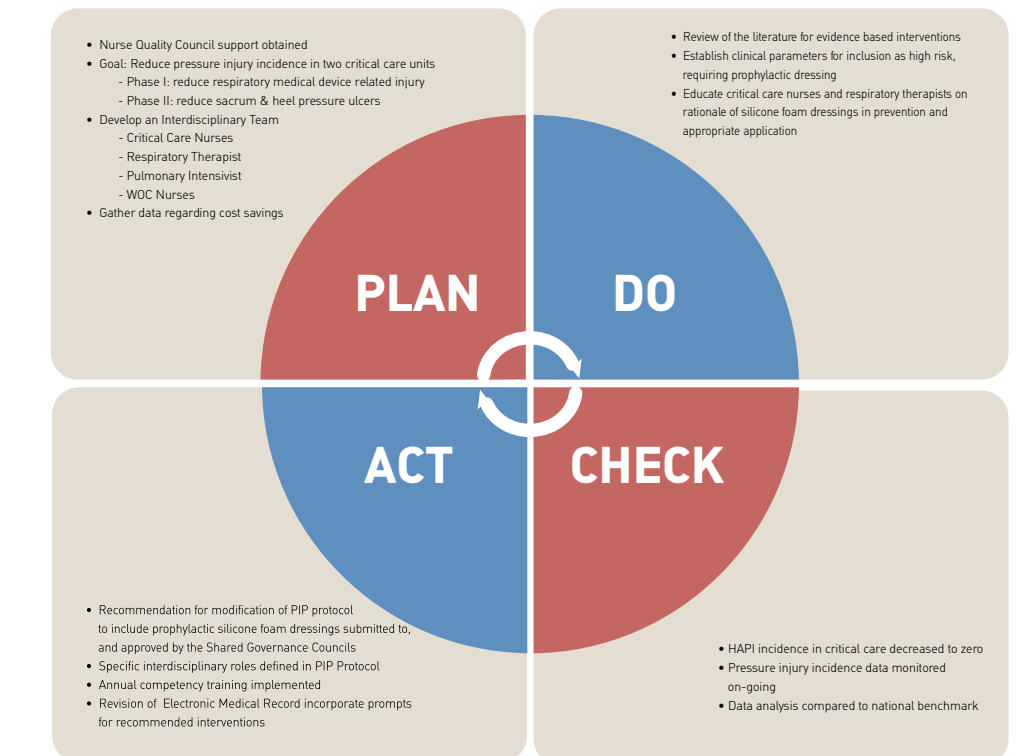
**Table 1:** Inclusion criteria for Respiratory Device Bundle

Critical Care	Inclusion Criteria for Respiratory Medical Device Related Pressure Injury Prevention Trial			
	DEVICE	CRITERIA	ACTION	EXAMPLE
#1	Nasal Cannula/Oxygen Mask	2 or more risk factors are present • Braden score < or = 13 • Use of vasopressors • Localized tissue edema • Home O2 use	Apply foam to nose, ears, and cheeks	Refer to pictures and cutting diagram
#2	Vapotherm/high-flow nasal cannula users	- All patients	Apply foam to nose, ears, and cheeks	
#3	Non-Invasive Ventilation	- All patients	Apply foam (thin)	
#4	Tracheostomies	- All patients	Apply foam (thick)	

**Table 2:** Inclusion Criteria for Sacral/Heel Prophylactic Dressing Application

Inclusion Criteria for Sacral/Heel Prophylactic Dressing Application
Hemodynamic Instability, Hypothermic Therapy and/or Trauma
Ventilated
Sepsis
Anticipated surgery procedure of greater than or equal to 3-4 hours
Clinical judgement
Bedbound, immobility, or compromised mobility related to health status
History of pressure injury

**Figure A – PDCA<sup>6</sup>**



## Citations

1. The Affordable Care Act. Available at: HYPERLINK "http://www.hhs.gov/healthcare/rights/law/" www.hhs.gov/healthcare/rights/law/ Accessed 12/18/15.
2. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers. Clinical Practice Guideline. Emily Haesler (Ed.) Cambridge Media: Perth, Australia; 2014.
3. Santamaria N, et al. A randomized controlled trial of the effectiveness of soft silicone multi-layered foam dressings in the prevention of sacral and heel pressure ulcers in trauma and critically ill patients: the border trial. *Int Wound J*. 2013;16(1):7-17.
4. Lyder C, Wang Y, Matersky M. Hospital-acquired pressure ulcers: results from the National Medicare Patient Safety Monitoring System study. *J Am Geriatric Soc*. 2012;60:1603-1608.
5. Black J, Alves P, Brindley C, et al. Use of wound dressings to enhance prevention of pressure ulcers caused by medical devices. *Int Wound J*. 2015;Jun;23(3):322-7. doi: 10.1111/iwj.12111. Epub 2015 Jul 1.
6. Nakayama D, Bushey T, Hubbard I, et al. Using a plan-do-act cycle to introduce a new OR service line. *ADRN J*. 2010 Sept;9(2):335-344.