Pressure Injury Prevention:
Exemplary Strategies Sustain Zero Is Par for the Course

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Clinical Challenge

Our hospital continuously seeks new strategies to address nursing challenges to achieving exemplary patient outcomes while streamlining nursing processes and minimizing cost. A key patient safety goal is to maintain rates of "0" hospital-acquired pressure injuries (HAPIs) on all patient units.

HAPIs can occur in less than 2 hours, particularly in patients with diagnoses such as failure to thrive, frailty, immunosuppression, uncontrolled pain, difficulty with turning and positioning, and stage 1 or 2 pressure injuries. Thus to prevent injury, Nursing must assess and meet the need for an appropriate support surface immediately upon patient admission to the unit.

Methods / Strategies

HAPI-prevention support surfaces redistribute pressure over the patient's body. In May 2016, our hospital's wound-ostomy-continence (WOC) nurse reviewed system-wide processes for acquiring/using specialty beds to prevent HAPIs. Use of specialty beds/surfaces promoted exemplary outcomes but renting support surface upgrades delayed patient placement and was costly.

The WOC nurse collaborated with nurse colleagues at system hospitals and the system's supply chain/purchasing department to evaluate new mattress overlay options and improve the nursing process for on-admission placement of pressure-redistribution techniques for at risk medical-surgical patients.

Strategies included teamwork (Nursing, Finance, Supply Chain, Leadership) to develop the system's Specialty Bed Utilization Policy (approved November 2016; system-wide staff education conducted online during December 2016); literature review (see References), collaboration with system nursing colleagues on best practices/products to achieve quality outcomes; innovation (vendor pressure-distribution mapping) to compare old (rental beds) and new devices (static air overlays; see Pressure Mapping Results that follow); and engagement of frontline staff.

Because delivery of a rental support surface (specialty bed) can take up to 4 hours, a key strategy in achieving our goal of instituting on-admission HAPI-prevention support surfaces was to investigate the effectiveness of static air overlays that to be placed over the mattresses on our hospital-owned beds. The WOC nurse had investigated a static air overlay cushion with ventilation holes* to be placed under the patient's hips while in bed or in a chair or wheelchair and making this static air pressure-redistribution device available in par stock for implementation immediately upon patient admission and continuous use throughout hospitalization (including during in-house transfers) and at home after discharge.

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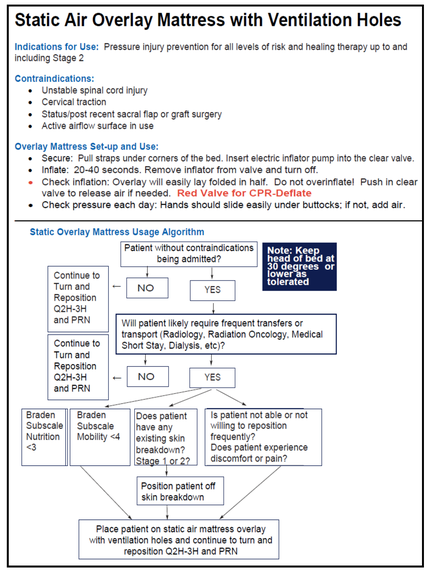
Methods / Strategies (continued)

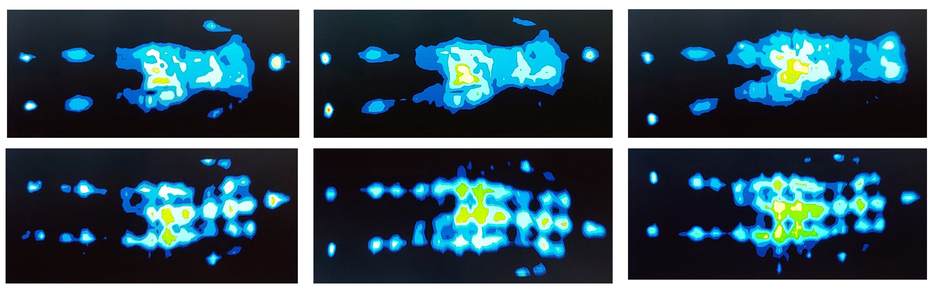
The static overlay air cushion with ventilation holes was par-stocked on medical and surgical units starting in January 2017 and staff were educated on use of the new product ("Static Air Overlay Mattress with Ventilation Holes"). The hospital's Skin Health Champions led their units in implementing the new nursing process.

Pressure Mapping

The hospital's WOC nurse worked with the overlay vendor to evaluate the pressure-redistribution effectiveness of the hospital mattress alone vs. with the static air overlay mattress. The following images show how pressure was distributed for a healthy woman with a body mass index of 31.5 without (top row) and with (bottom row) the static air overlay. Map colors indicate where pressure is low (blue or green), higher (yellow or orange; reposition Q2-3 hours) or unacceptable (red; switch to an active pressure-redistribution surface).

The smaller areas of yellow on the bottom row of images demonstrate that pressure is more effectively distributed when a static air surface with ventilation holes is placed over the hospital bed mattress. Note how areas of increased pressure (yellow) increase as the head of the bed (HOB) is elevated. For this reason, our hospital's algorithm for use of the overlay mattress requires avoiding HOB elevation >30 degrees and turning/repositioning every 2-3 hours.





Supine | **Head of bed (HOB) up 30 degrees** | **HOB up 45 degrees**

Limitations

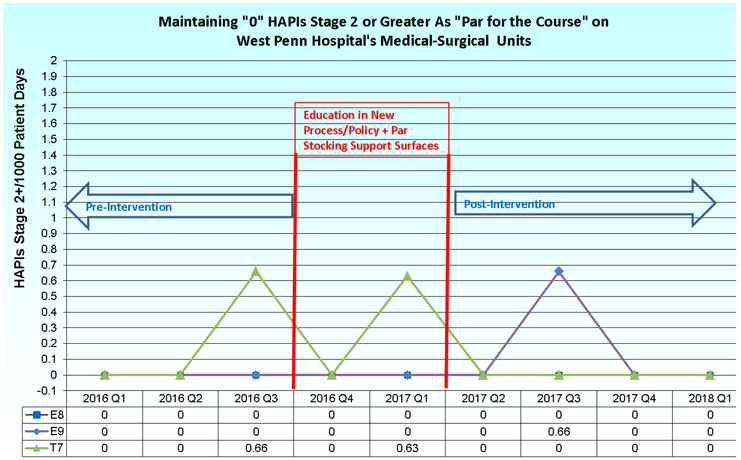
Static air overlays with ventilation holes support pressure redistribution for most bariatric patients weighing up to 600 pounds. They do not provide sufficient pressure redistribution/relief for all bariatric patients or for those in critical care areas or who are post-reconstructive surgery. Rental beds (dynamic powered support surfaces) are necessary for these patients and those with multiple full-thickness wounds or moisture issues. Additionally, static air overlays cannot be used on top of an integrated bed system (mattress powered and integrated with the frame).

Additional nursing considerations are that the static air overlays need to be checked daily for "bottoming out" – the caregiver's hand cannot slide between the mattress and the overlay. In this case, air must be added to the overlay (usually 4 pumps are adequate).

Evaluation / Outcomes

Nursing staff engagement with the new strategies and devices for HAPI prevention:

- Have yielded exemplary outcomes – in particular, medical units have maintained HAPI rates of 0/1000 patient days for 1 year after implementation (see graph)
- Are highly cost-effective (one-time cost of overlay is less than daily bed rental; for average length of stay of 4 days, the overlay provides an 82% cost savings per patient)
- Are rapidly and easily initiated, including by nursing assistants
- Are used by the patient throughout the continuum of care to home (overlays are used for offloading during transfers and procedures for patients up to 300 lbs.)



	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1
E8	0	0	0	0	0	0	0	0	0
E9	0	0	0	0	0	0	0.66	0	0
T7	0	0	0.66	0	0.63	0	0	0	0

Implications for Practice

Effective change in nursing practice and policies relies on teamwork, collaboration, and innovative evaluations of new processes and patient care products/devices. Patient safety depends on high staff engagement and par-stock availability of suitable patient care products on the unit and is sustained on the unit, during transport, procedures, and after discharge.

References

- McNichol L et al. (2015). Identifying the right surface for the right patient at the right time: Generation and content validation of an algorithm for support surface selection. Journal of Wound Ostomy Continence Nursing. 42(1):19-37.
- National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and Pan Pacific Pressure Injury Alliance. (2014). Support Surfaces. In: Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Cambridge Media, Australia.
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