

EDITORIAL

The Standardized Pressure Injury Prevention Protocol for improving nursing compliance with best practice guidelines

1 | BACKGROUND

Compliance with international best practice guidelines can effectively prevent most hospital-acquired pressure injuries (HAPIs) (Black et al., 2011; Padula et al., 2016). These guidelines include several nursing interventions that first were introduced in 1992 by the U.S. Agency for Healthcare Research & Quality (AHRQ), and have since been updated by the National Pressure Ulcer Advisory Panel (NPUAP) every 3–5 years (NPUAP, 2014; Panel on the Prediction and Prevention of Pressure Ulcers in Adults, 1992. AHCPR Publication No. 91-0047). Following admission, nurses should perform a daily skin check and risk assessment using a validated risk tool (Bergstrom, Braden, Laguzza, & Holman, 1987; Braden & Bergstrom, 1994). Patients determined to be high-risk receive additional measures: (a) repositioning every 2–4 hr; (b) managing skin care and incontinence; (c) improving nutrition; (d) using pressure-relieving support surfaces; and (e) reducing friction and shear (Agency for Healthcare Research and Quality, 2011; NPUAP, 2014). Many hospitals struggle to incorporate these guidelines into a daily routine given the intense amount of nursing time, costliness to implement, uncertain clinical effectiveness, and competing patient demands and hospital priorities.

Nonetheless, compliance with the HAPI prevention protocol is a cost-effective investment, if not cost-saving compared to the incurred costs of treating life-threatening, infected wounds that begin as HAPIs. An economic evaluation of HAPI prevention first estimated the cost of the complete pressure injury prevention protocol between \$50–100 per patient per day including all materials (Padula, Mishra, Makic, & Sullivan, 2011). However, efforts to conserve nursing time spent on HAPI prevention are worthwhile and improve the value of the prevention guidelines (Padula et al., 2018).

2 | QUALITY IMPROVEMENT

Quality improvement (QI) interventions reflect the adoption of concepts or technologies that enhance structure at the unit level through four domains according to Nelson and colleagues' best practice framework: Leadership; Staff; Information Technology; Performance and Improvement (Padula, Mishra, Makic, & Valuck, 2014). New technologies including prophylactic dressings, support surfaces, incontinence management, nutrition and repositioning, act as QI interventions to enhance compliance with clinically effective

elements of the guidelines and save nursing time. Each of these types of QI interventions also possess stand-alone evidence to support or scrutinise their use.

2.1 | Risk assessment tools

The Braden Scale evaluates patient risk based on six subscales: (a) mobility; (b) friction and shear; (c) sensory perception; (d) nutrition; (e) activity; and (f) moisture. It is over 30 years old and, according to the American College of Physicians, its predictive validity is based on "weak" scientific evidence (Qaseem, Mir, Starkey, & Denberg, 2015). It lacks adjustments for many known pressure ulcer risk factors including perfusion, age, race and certain clinical criteria (e.g., body mass index, diabetes, vasoactive drugs). Moreover, there is no guidance for how previous Braden scores could impact future Braden scores. In addition, hospitals often face poor inter-rater reliability of Braden scores between nursing staff as well as variable rates of daily completion. Perhaps this is because nurses perceive repeated risk assessments of low value or gain no guidance on which interventions should be implemented based on the score, or because hospitals cannot support nursing time allocated specifically to best practice guideline compliance for which remuneration is low (Padula, Mishra, Weaver, Yilmaz, & Splaine, 2012).

2.2 | Prophylactic dressings

Recently, five-layer foam sacral dressings that are commonly used to cover the incisions of postsurgical patients or those with complicated injuries to the skin (e.g., traumatic such as burns) have been explored for use prophylactically to prevent HAPIs. These dressings are used to mitigate the loading forces applied to the tissues between the support surface and bony prominence, or between the skin and underlying connective tissues and a medical device. Several studies have published on the clinical effectiveness of a five-layer dressing called "Mepilex®." Brindle first reported a QI study demonstrating the potential benefit of these foam sacral dressings for pressure injury prevention in surgical intensive care patients (Brindle, 2010). Santamaria and colleagues used a randomised trial to show the efficacy of these prophylactic foam dressings applied to the sacrum and heels in the prevention of pressure injuries, demonstrating both clinical effectiveness and cost-benefit (Santamaria & Santamaria, 2014; Santamaria, Gerditz, Liu, et al., 2015; Santamaria, Gerditz, Sage, et al., 2015; Santamaria, Liu, et al., 2015). A

randomised trial by Kalowes and colleagues validated these reports of clinical efficacy. Further, a systematic review of nonexperimental prospective studies demonstrated considerable benefit of prophylactic Mepilex foam dressings for sacral and heel pressure injury prevention (Davies, 2016; Kalowes, Messina, & Li, 2016). An observational study aggregating outcomes across a 1.05 million patient sample found significant declines in HAPI rates of up to 34% associated with adoption of these prophylactic dressings, in addition to improved nutrition regimens and skin care (Padula, 2017; Padula et al., 2015).

2.3 | Beds and support surfaces

The use of pressure-redistributing support surfaces is standard practice in hospitals. Robust data on the selection of specific mattresses do not exist; a Cochrane Systematic Review reported that the relative merits of alternating versus constant low-pressure surfaces are unclear (McInnes et al., 2015). A similar conclusion was reached by Tayyib and Coyer that evidence on the effectiveness of support surfaces for the critically ill is limited (Tayyib & Coyer, 2016). Therefore, the 2014 NPUAP Guideline is the best guidance (2014). Per the guideline, the critically ill patient requires a surface that immerses the patient to reduce pressure, and when the critically ill patient cannot be turned, the surface should be upgraded to an alternating pressure mattress. A recent systemic review reported that static air overlays can also reduce pressure injury risk in the intensive care unit (ICU) (Serraes et al., 2018). Delay in using an upgraded support surface for patients has also been associated with greater numbers of pressure injuries in the critically ill (Bly, Schallom, Sona, & Klinkenberg, 2016).

2.4 | Patient repositioning systems

The traditional method of turning patients includes manual turning by the healthcare worker and the use of pillows to support the patient in the desired position. This method often led to back injury for the healthcare workers and inadequate turns (<30° lateral). Patient repositioning systems are used to ergonomically move the patient in bed and support them once in a side-lying position. In a small study in ICU, Powers introduced a patient positioning system with particular devices that reduced pressure injury rates, supported the patient at 30 degrees and reduced back injuries in healthcare workers (Powers, 2016).

In addition to repositioning devices, fluidised positioners play an important role in stabilising limbs, the head and sacrum in one place for extended periods, such as for surgical patients and those who are unconscious. Brennan and colleagues reported a 45% reduction in the rate of pressure injury in a cardiovascular ICU, a 52% reduction in the surgical ICU and a 27% reduction in the medical ICU after using the fluidised positioners (Brennan, Laconti, & Gilchrist, 2014).

2.5 | Skin care

Maintaining skin health improves the tolerance of skin and soft tissues for pressure and shear. Today, to reduce hospital-acquired infections, chlorhexidine bath care performed daily along with perineal bathing to reduce the rate of catheter-associated urinary tract infections

(Pronovost, 2008). This project will not alter the existing skin care practices, except to ask that the skin of the buttocks and heel not be moisturised prior to the application of the preventive dressings in order to improve the dressing's adhesiveness to the skin.

3 | THE STANDARDIZED PRESSURE INJURY PREVENTION PROTOCOL (SPIPP)

While evidence exists for the efficacy of these technologies in controlled settings as stand-alone interventions, research has not tested the interactive effects of combining these technologies into a single QI bundle, controlling for the existing clinical guidelines to measure changes in HAPI rates. Furthermore, the American College of Physicians has urged the field of wound care to conduct higher quality clinical research to enhance prevention evidence (Qaseem et al., 2015). To improve the outlook of HAPI prevention in the USA, new research needs to close the gap in our understanding of the clinical effectiveness of a QI bundle that combines multiple technologies with support from a structured clinical team. We introduce the Standardised Pressure Injury Prevention Protocol (SPIPP) as a QI bundle designed specifically to enhance best practice guidelines for HAPI prevention by combining concepts and technologies with the best available evidence from the field of wound care (Figure 1).

Standardised Pressure Injury Prevention Protocol is an effective QI bundle for HAPI prevention since it encapsulates all four domains of Nelson and colleagues' best practice framework of hospital structure in the form of a checklist. As a checklist, it takes a complex process such as HAPI prevention and simplifies it into core components, each with a QI intervention to support the entire process. Therefore, SPIPP increases the probability of success with an objective as complex as HAPI prevention (Nelson, Batalden, & Godfrey, 2007; Padula et al., 2014). Together with a team of HAPI prevention thought-leaders, we have developed SPIPP to support clinician and patient access to the most advanced QI technologies, methods and concepts in HAPI prevention that encompass these principles (Figure 1).

4 | IMPLEMENTATION PROCESSES

Introducing a new QI bundle such as SPIPP may improve practice and outcomes related to HAPIs. However, effective implementation of SPIPP requires the right framework and support structure. Several QI frameworks offer insight into the process of customising and implementing SPIPP locally for improved patient care.

4.1 | The Donabedian model (structure–process–outcomes)

Donabedian describes QI as a construct to establish *Structure* in order to standardise efficient *Processes* that lead to improved *Outcomes* (Donabedian, 1992). This framework is referenced as

Standardised pressure injury prevention protocol (SPIPP) checklist	
Education & onboarding: engage with senior leadership, implement patient & caregiver education, review outcomes monthly	
- Engage senior leadership in Prevention of Pressure Injury Prevention ("C" Suite Sign Off) - Identify wound champion in clinical care to lead SPIPP (e.g. CWS, CWOCN, QI Manager, Hospitalist, PT, Dietician) - Complete the "perspectives on Prevention" courses on Connect2Know with 90% Staff completion of: Overview; Skin; Our Ultimate Defense; Legal Aspects; Critical Care - Implement training on pressure injury prevention - Implement patient & caregiver prevention of pressure injury education - Document outcomes in quality measurement system and claims data system - Recommendation: publish project results as a quality improvement project poster at an appropriate conference (e.g. WOCN, IHI, NPSF, SAWC)	
Risk assessment (braden scale or facility tool): upon admission/upon readmission/with change in condition	
- Reassessment on each Day/Shift - Assess for and manage localized pain	
Use a structured skin assessment & document findings for head-to-toe exam within 8 hours of admission and at regular intervals	
- Assess bony prominences and tissue under and surrounding medical devices (Sacrum, Heel, Occiput, Elbows, Medical Devices) - Carefully assess change in color; patient with dark skin tone will need particular attention including palpation - Ensure skin is clean and dry - Assess for moisture, employing fecal and urinary incontinence management devices as needed - Apply moisturizer and barrier creams after cleansing (do not apply under dressings) - Use a single breathable incontinence pad under each patient	
Repositioning & mobility: general recommendations	
- Turn and reposition on individualized schedule basis - Use a 30-degree turn off the sacrum, ensuring that the sacrum is offloaded - Use positioning aids that redistribute pressure/shear, minimize friction, maintain desired position, and protect vulnerable bony prominences, even in the supine position; consider devices that provide positive air displacement and/or conformational positioning - Use a pressure redistributing chair cushion when mobilizing the patient to chair or wheelchair	
Pressure, friction and shear reduction	
- Alleviate pressure through effective use of repositioning devices - Choose appropriate support surface based on patient risk - Apply soft-silicone five layer foam dressings to areas at-risk (sacrum, heel, other); use dressings, constructed for pressure injury prevention, as validated through high-level clinical and scientific evidence (i.e. published and peer-reviewed RCT, meta-analysis, systematic review and finite element modeling) - Ensure that the heels are free from the bed - Use a soft-silicone five layer foam dressing for the heel when the leg cannot be elevated off the surface of the bed - Use heel suspension devices for long term immobility; consider devices with a low pressure air chamber that maximizes surface area - Apply soft-silicone five layer foam dressings under medical devices, as appropriate	
Nutrition: consult registered dietician	
Facilitate nutrition plan	

FIGURE 1 The Standardised Pressure Injury Prevention Protocol (SPIPP) checklist [Colour figure can be viewed at wileyonlinelibrary.com]

a global standard for improving nursing quality according to the American Nurses Credentialing Center (ANCC) Magnet® recognition program. Checklists such as SPIPP represent a preferred structural mechanism to standardise guidelines since these tools are intuitive for clinicians to complete in stressful, time-dependent situations, such as Pronovost and colleagues *Keystone ICU Checklist* for preventing central line infections or Haynes and colleagues *Surgical Safety Checklist* (Gawande, 2009; Pronovost & Vohr, 2010).

4.2 | The clinical microsystem approach

A clinical microsystem approach can be used to maximise the effectiveness of SPIPP implementation (Nelson et al., 2007). While the implementation of SPIPP may occur across an entire health system to improve system-wide outcomes, adoption of SPIPP resources bundled

with practice guidelines to prevent pressure injuries happens at the level of the clinical microsystem (i.e., within clinical units; Nelson et al., 2008). In many cases, each unique microsystem within a health system uses subtle variations of a QI bundle to address the specific needs of their patient populations and fit the culture of the unit. This approach creates a multilevel model of QI with SPIPP (Figure 2).

4.3 | Culture of preventive care

Nurses working in clinical units balance the acute actual needs of the patient with the available time to address prevention goals. There is no question that early intervention to prevent pressure injury is required, but the interventions must be integrated into the workflow process. Support surfaces must be present at the time of admission, because moving the unstable critically ill patient is often not possible. Preventive dressings must be available and placed quickly during movement of the

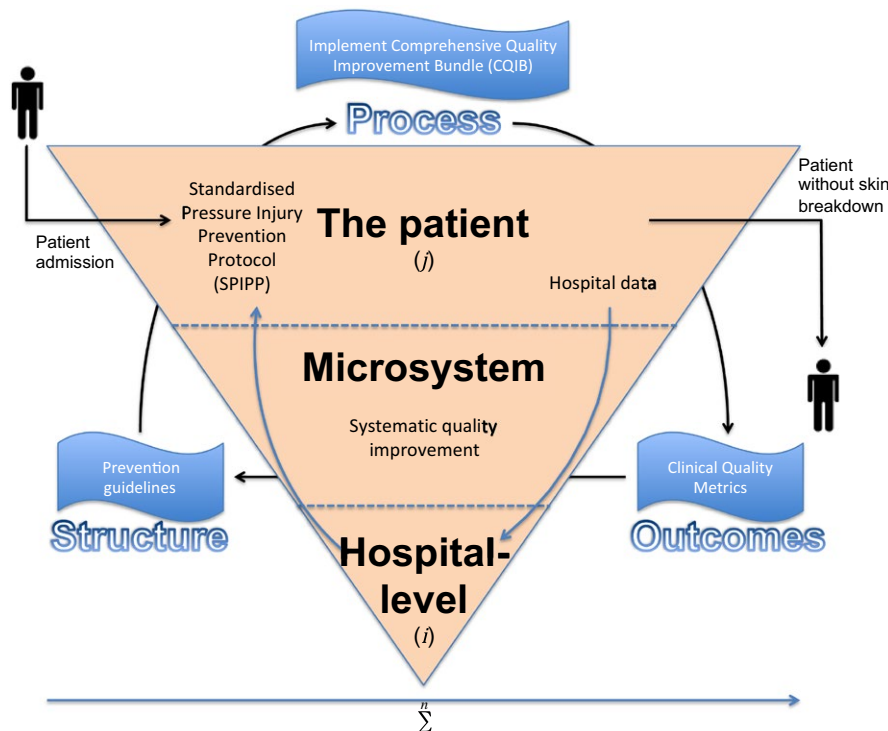


FIGURE 2 Inverted pyramid of multilevel model for a healthcare delivery system with the Standardised Pressure Injury Prevention Protocol (SPIPP) [Colour figure can be viewed at wileyonlinelibrary.com]

patient. However, none of these interventions are completed if the nurse lacks the knowledge of best practice guidelines for pressure injury prevention or lacks the attitude about their significance. Implementation depends on experienced knowledge about HAPI prevention and attitude that compliance with prevention will achieve measurable improvements.

5 | CONCLUSION

The SPIPP checklist of QI interventions is well positioned to have an immediate impact on HAPI prevention in hospitals globally. Successful implementation of SPIPP to support best practice guidelines depends on financial support and advocacy from system leadership, a carefully constructed team of experienced wound care experts and unit champions in HAPI prevention, as well as access to the right technologies for pressure injury prevention and clinical care (Padula & Makic, 2017). Health systems with these resources should be well prepared to assume the task of implementing change through SPIPP using core concepts in QI and implementation science to achieve the goal of standardising SPIPP.

CONFLICT OF INTERESTS

William Padula and Joyce Black are on the Board of Directors for the National Pressure Ulcer Advisory Panel (NPUAP), which is a volunteer position. Padula and Black also serve on the global advisory board for Mölnlycke Health Care. They have no other financial conflict of interests to declare, financial or other.

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