

# Pressure injuries... Prevention across the acute-care continuum



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## Introduction to pressure injuries: Prevention across the acute-care continuum

# Pressure injury prevention requires an effective and sustainable program

#### By Melissa A. Fitzpatrick, MSN, RN, FAAN

ressure injuries (PIs) have presented a significant risk to patients and a clinical challenge to nurses and other clinicians since before nursing became a profession. The skin is the largest organ of the body and although it doesn't get the same attention as the heart, brain, liver, and lungs, it can be the most serious threat to a patient's survival or at the very least, to his or her comfort and well-being. How often does a criticalcare team work diligently to revive a patient in cardiogenic shock only to have him succumb to an infected PI? What about the perioperative team that toils over the neurosurgical patient to successfully restore function only to have her succumb postoperatively from the sequelae of a deep-tissue injury?

We know from the National Pressure Ulcer Advisory Panel that not all PIs are avoidable, but we also know that most are when excellent assessment, physical care, multidisciplinary teamwork, and technology are used to ensure adequate perfusion.

Never have our patients needed these caregiving elements more than today. With patient acuity, age, and comorbidities rising, risk for all so-called "never events" like PI has escalated as well. Those risk factors follow patients across the acute care continuum, so an effective PI-prevention program must include many care environments—including perioperative units, interventional radiology, cardiac catheterization labs, dialysis units-that weren't historically part of the plan. For example, patients who are "boarding" in the ED on a stretcher for hours or even days require the same skin protection as those who've been admitted to an inpatient bed. And those in the OR who are anesthetized and unable to reposition themselves are at risk for PIs. Decreases in perfusion are cumulative, and they're perpetuated across care settings when adequate perfusion isn't assured. A skin injury that begins in the ED can be exacerbated in the OR and then appear as a PI in the critical-care unit. Patients need pressure redistribution and tissue off-loading in all care settings.

This special report takes all of these patient, team, and environmental factors into account and describes best practices, tools, and solutions for skin safety. I want to thank the thought leaders who shared their wisdom in creating this body of knowledge. The authors describe the current state of PIs and their assessment and prevention as well as strategies used to mitigate risk across a variety of acute-care



settings. They also share best practices for multidisciplinary collaboration across settings to ensure that prevention practices are sustained as patients transfer from one area to another. In case studies, you'll learn how clinical experts have explored a variety of approaches and solutions that you can put into practice tomorrow.

You'll also find discussions on technology solutions and strategies for making the business case to acquire the technology needed to support your PI-prevention initiatives.

The many spokes on the PI prevention wheel must be in full gear to create an effective and sustainable program. As patient needs and acuity escalate, clinical excellence and patient advocacy will be more important than ever. Industry experts can play an important role as your partners in clinical quality and patient safety. At Dabir, our mission is to be your partner as you create evidence-based practice environments and teams that prevent PIs and enhance patient outcomes. We hope that this special report will assist you and your teams in these efforts and provide you the best solutions and approaches to PI prevention.

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## Take action to solve causes of pressure injuries

Acute-care settings present challenges for PI prevention, but solutions exist

By Jan Powers, PhD, RN, CCNS, CCRN, NE-BC, FCCM, and Corinne (Cori) Ames BSN, RN, CMSRN



urses are on the frontlines of pressure injury (PI) prevention, assessment, and management. Understanding PI risks and causes and having a firm grasp on the tools and skills required for accurate assessment help to ensure successful patient outcomes. (See *PI etiology*.)

In this article, we'll discuss nursing considerations related to PIs within the acute-care setting, including methods to enhance patient care.

#### **Risk factors**

While the most significant PI risk factor is reduced movement or immobility, several factors can place patients at risk, including decreased perfusion and oxygenation, increased skin moisture and temperature, friction and shear, decreased sensory perception, hemodynamic instability, vasoactive medications, intensive care unit (ICU) length of stay, surgery, and overall health status. Pressure from medical devices such as catheters, and I.V. and endotracheal tubes—also can cause PIs. And patients with existing PIs are at increased risk for others.

Nutritional deficiency and advanced age have been shown to increase the risk of PIs. Aging decreases dermal thickness and sensory perception, which can lead to more rapid tissue injury but leave patients less likely to respond to tissue cues to change position. Poor nutritional status may result in decreased protein, rendering tissue more susceptible to the effects of pressure.

Intensive nursing care decreases complications and improves patient outcomes. Studies have suggested that PI development also can be affected by the number of nurses and time spent at the bedside. A structured approach that includes comprehensive risk assessment is recommended to identify PI risk. Use a reliable and valid tool appropriate to the specific patient population, and implement interventions specific to the patient's needs based on the scoring criteria used.

#### Acute-care challenges and solutions

Nurses in acute-care settings often juggle multiple needs for multiple patients, some with several comorbidities, which requires impeccable organizational skills. All acute-care settings should have a comprehensive prevention program that includes risk assessment, skin care, pressure redistribution, friction and shear management, incontinence/moisture management, nutritional assessment and interventions, education (for both clinical staff and patients), and communication.

#### **PI etiology**

Pressure injuries (PIs) occur when direct pressure causes tissue ischemia in the skin, muscle, and fascia. This typically occurs over bony prominences, but also can occur in other locations. Direct pressure causes compression of small vessels and prevents oxygen from being delivered at the capillary interface, resulting in edema that further compresses small vessels and increases tissue ischemia and death. Pressure duration and intensity are directly related to tissue damage. Most PIs occur on the sacrum, coccyx, and heels.



(See *Key strategies*.) However, specific settings— ICU, emergency department (ED), and operating room (OR)—have their own unique challenges and solutions. Here's an overview; you can learn more by reading related articles in this special report.

#### **Emergency department**

Patients in the ED often present with life-threatening or serious health conditions that take priority over skin assessment. However, while patients are in the ED, they're typically cared for on transport carts that may not have the same types of pressure-reduction mattresses as hospital beds. Some facilities have protocols to add additional pressure-reducing surfaces for high-risk patients in the ED. Also, because many patients move out of the ED quickly, no protocol exists for turning patients at least every 2 hours. Take note of patients who stay longer than 2 hours and reposition them as needed.

#### **Operating room**

Unique challenges in the OR include operating tables and required patient positioning. OR tables are rigid and can cause significant PIs if they're not appropriately padded or if the patient isn't properly positioned. Similarly, medical devices used during surgery should be padded and carefully positioned to prevent PIs. Because patients can't be repositioned during surgery, assess for potential pressure areas and patient risk, and request prevention accommodations before surgery begins.

#### Intensive care unit

Patients in the ICU must contend with multiple medical devices that may cause PIs, as well as conditions and medications that may cause vasoconstriction and reduce blood flow to the skin. The resulting decrease in perfusion and oxygenation may make patients more susceptible to PIs. Patients in the ICU generally require multiple medications for hemodynamic instability, which may make repositioning a challenge due to blood pressure changes. You can still shift patients to relieve pressure, just use smaller adjustments and turns. In addition, patients in the ICU are at increased risk of malnutrition and require interdisciplinary coordination to implement early nutritional support. They also may experience temperature variations—either hypothermia, which decreases perfusion, or hyperthermia, which increases moisture. Maintain normothermia when possible.

#### Nursing considerations

The most important aspect of nursing care is dili-

#### **Key strategies**

Follow these key strategies to prevent pressure injuries in acutecare settings.

- Use support surfaces that offer pressure relief/reduction and manage the microclimate.
- Reposition patients to reduce the duration and intensity of pressure over vulnerable areas. Avoid positioning the patient on bony prominences with existing nonblanchable erythema.
- Use transfer aids to avoid dragging the patient while repositioning and reduce friction and shear forces.
- Use positioning devices to offload sacral pressure (30-degree side-lying position) and prevent pressure on bony prominences. Assess whether actual offloading has occurred by placing your hand under the patient's sacrum to determine whether it's off the bed.
- Teach chair-bound patients, who are able, to shift their weight every 15 minutes. Use pressure-relieving surfaces under patients while they're sitting.
- Maintain a clean environment and use containment and barrier products to protect the skin from stool, urine, and other fluids. Clean skin promptly after incontinence.
- Manage skin microclimate by decreasing/absorbing moisture, containing moisture, and managing temperature (maintain normothermia). Choose support surfaces that provide microclimate management.
- Assess nutrition and hydration. Consult dieticians as appropriate.
- Check all medical devices for potential pressure; remove pressure or pad the device as necessary.
- Consult with certified wound care nurses to help determine prevention strategies.
- Use prophylactic dressings over bony prominences as indicated.

gent assessment and implementation of prevention strategies. Assessments should be performed at admission, by each nurse on each shift, when patients are transferred, and at discharge. Many organizations have adopted two-person skin assessment at admission. The skin assessment score should then direct you to the appropriate prevention strategies.

Use protocols, guidelines, order sets, or care plans that outline appropriate nursing care measures based on risk assessment and prevention strategies. The bundle approach is a comprehensive, collaborative solution for PI prevention or reduction. In two recent studies, PIs were decreased significantly after implementing a bundle of prevention strategies.

Prophylactic dressings, such as a polyurethane foam dressing on bony prominences, may help prevent PIs in anatomical areas frequently subjected to friction and shear. These dressings also can be used to protect skin from medical devices. Choose prophylactic dressings designed to allow for regular skin assessments. For example, they should have soft silicone borders that are easy to lift for routine skin checks without creating tape burns or other injuries.

Other research-based measures include standardized communication tools to enhance interdepartmental collaboration, and support surfaces—such as mattress overlays and specialized bed surfaces—that alter the microclimate by regulating the rate of moisture evaporation and heat dissipation.

#### A centerpiece of care

PIs can occur in any acute-care environment. You and your colleagues should understand the factors that place patients at increased risk for PI and be knowledgeable about prevention strategies. A onesize-fits-all prevention option doesn't exist, so the best approach is comprehensive, collaborative bundling of multiple interventions individualized to each patient. Make PI awareness and education a centerpiece of your nursing care.

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# The challenge of pressure injuries

### Statistics related to pressure injuries (PIs) are alarming.

- About **1.2 million** cases of hospital-acquired PIs occurred in 2015—36.3 per 1,000 discharges (**31.6%** of total hospital-acquired conditions).
- Patients with PIs have longer lengths of stay (7 vs. 3 days), higher mortality (9.1% vs. 1.8%), and higher costs (median total cost of \$36,500 vs. \$17,200), compared to those without PIs.
- More than 17,000 PI-related lawsuits (average cost \$250,000) are filed each year.
   PIs are the second most common claim after wrongful death; more common than falls or emotional distress.
- As of 2008, the Centers for Medicare and Medicaid Services **doesn't pay** for hospital-acquired PIs.
- Up to 60,000 Americans die each year as a direct result of a PI.



Note: Older and younger patients and those with nutritional problems, as well as clinicians' insufficient knowledge of the importance of support surfaces (and how to choose one), create challenges in all acute-care areas.

Sources: 2016 National Healthcare Quality and Disparities Report chartbook on patient safety. Rockville, MD: Agency for Healthcare Research and Quality; July 2017. AHRQ Pub. No. 17-0037-EF. bit.ly/2lv75n1; Bauer K, Rock K, Nazzal M, Jones O, Qu W. Pressure ulcers in the United States' inpatient population from 2008 to 2012: Results of a retrospective nationwide study. Ostomy Wound Manage. 2016;62(11):30-8; Agency for Healthcare Research and Quality. Preventing pressure ulcers in hospitals: Are we ready for this change? 2014. bit.ly/2H9MbKE

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# Best practices for pressure injury prevention in the ED

Don't let urgent and emergent needs overshadow PI prevention.

By Diane Long PhD, RN, SCRN

njuries were once thought to be unavoidable occurrences or accidents, but the Emergency Nurses Association (ENA) states that "injuries follow a predictable pattern, thus making them preventable." The National Pressure Ulcer Advisory Panel describes a pressure injury (PI) as a "localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure or pressure in combination with



shear." This meets the ENA's assertion of a discernible pattern, which means PIs are preventable. Preventing new PIs or exacerbation of current injuries is an ongoing standard in emergency department (ED) nursing, but competing urgent or emergent priorities can leave PI prevention lost in the shuffle.

A 2017 meta-analysis found that PI incidence in ED patients ranged from 0.38% to 19.1%, and that the pooled incidence was 6.3%. The authors noted that even during a short stay in the ED, PI is a "common occurrence," especially stage 1 injuries that can occur within just a few hours of arrival. Changing ED patient demographics have contributed to these statistics; ED stays have lengthened, and aging Baby Boomers are arriving sicker and with multiple comorbidities.

#### Early recognition, prevention interventions

Recognizing PI risk factors early and instituting appropriate preventive interventions should be best practice among ED nurses. Recognition can begin before the patient arrives at the hospital. In the emergency medical service (EMS) setting, PI has only recently been directly addressed and only in conjunction with injuries caused by cervical spine collars and long backboards. EMS culture is still struggling with the idea that long backboards aren't needed in most instances and should more properly be called "extrication boards." The current focus of EMS personnel is the immediate emergent needs of the patient, which hasn't embraced consideration of patient outcomes beyond that. Just as our ED culture will struggle to adapt to the new vision of PIs, EMS must work to incorporate PI considerations into their field of patient care.

Considering an ED patient's chief complaint and comorbidities is an essential first step in the early identification of PI risk. ED staff should watch for these risk factors:

- age (extremes of age—young and old)
- limited mobility or the inability to reposition
- loss of sensation
- malnutrition and dehydration
- moisture (incontinence)
- previous PI (skin over a healed PI may still be weaker than normal)

- current PI
- poor general health
- altered level of consciousness.

Evidence-based PI practices include risk assessment and preventive care interventions that improve patient outcomes and are cost effective for the organization.

#### **Risk assessment**

Structured risk assessment should begin as soon as possible after the patient arrives in the ED and then be repeated based on patient acuity (at least once per shift and when the patient's condition changes or deteriorates) and immediately before discharge. A validated risk assessment tool appropriate to the patient population, such as the Braden Scale for Predicting Pressure Sore Risk, can be useful, but it shouldn't be a substitute for your nursing judgment. (See *Structured risk assessment.*)

#### **Prevention**

Preventive care interventions focus on skin care, patient positioning, nutrition, and education.

#### Skin care

Keep patients' skin clean and dry. For those with incontinence, implement a continence plan using internal or external urine collection devices. However, avoid adult briefs when possible; they're a source of moisture retention and concealment. Skin damage from incontinence predisposes patients to injury. Consider prophylactic dressings on bony prominences, and don't position patients on areas of erythema.

ED stretchers offer little pressure support, so move patients to an appropriate high-specification foam surface. For extended stays, move patients from an ED stretcher to a patient bed as soon as possible. A level A (high) ENA recommendation states that within 2 hours after a baseline skin assessment, a pressure reduction surface should be used for patients who aren't mobile. Fagan notes that mattress overlays are the least expensive and most readily available option for PI prevention in the ED.

#### **Patient positioning**

Reposition patients frequently (at least every 2 hours; every 30 minutes if the patient is immobile). When the patient is side lying, turn him or her to 30 degrees; avoid 90-degree positions. Keep the head of the bed at less than 30 degrees, if possible, to prevent sacral shear. When transferring patients, use shear-decreas-

#### Structured risk assessment

To help prevent pressure injuries (PIs) in the emergency department, structured risk assessments should be conducted at least once per shift. In addition to performing a full-body skin assessment (which also can be done during bathing, toileting, and repositioning), you'll want to assess patient sensation, mobility/ activity, and nutrition.

#### Full-body skin assessment

During the full-body skin assessment, check:

- temperature, color, moisture
- edema, pain, and areas of tissue inconsistency
- healed and current PIs (these patients are automatically deemed high risk)
- areas around medical devices (such as nasal cannulas, endotracheal tube securement devices, and other lines and drains) for potential PIs.

#### Sensation assessment

Diminished or absent sensation increases PI risk because the patient can't sense pain as an indicator to change positions. Risk factors include:

- diabetes
- neurologic disorders and paralysis
- peripheral vascular disease; diminished sensation due to decreased blood flow.

#### Mobility/activity assessment

Bedfast and chairbound patients are at high risk for PI. Assess whether the patient can:

- turn in bed (they should turn at least every 2 hours)
- stand and ambulate (with or without assistance).

#### Nutrition assessment

Consider the following questions:

- Are height and weight proportionate?
- Can patients feed themselves?
- Are patients consuming adequate calories?

ing devices and size-appropriate equipment to facilitate ease of turning.

#### Nutrition

Remember to provide meals or snacks for patients who are waiting for a bed. Help patients with their meals and monitor their calorie intake.

#### Education

Teach patients about their personal PI risk factors to encourage adherence to self-care plans. Share this information with family members and caregivers so they can help implement risk-reduction recommendations. For example, patients with diabetes are at risk for dehydration and loss of *(continued on page 39)* 

# Take three steps forward to prevent pressure injury in medical-surgical patients

Nursing care is key to pressure injury prevention.

#### By Joyce Black PhD, RN, FAAN

Pressure injuries (PIs) are a serious complication of immobility, and they're a nursing quality standard. Insurers no longer reimburse for PIs that occur after hospital admission, and in some states, a full-thickness PI that develops during a hospital stay is reportable to the board of health.

The mission is clear—organizations must prevent PIs. If a PI occurs, early identification is key to prompt treatment. As the healthcare professionals closest to the patient, nurses are critical to achieving this mission. This article focuses on patients on medical-surgical units.



#### Pathways to PI

PIs occur through two pathways: short periods of time with high pressures and longer periods with lower pressures.

PIs can occur quickly in high-risk patients, especially if they're lying on firm or hard surfaces that produce high pressure. Patients who are unconscious, anesthetized, sedated, or paralyzed are unaware of how intense pressure has become on their soft tissue from lying on an operating room or diagnostic table, in a hospital bed, or from sitting in a chair. The force of pressure is exerted in the muscle and fat against the bone

and results in a deep-tissue PI, which presents as a persistent, nonblanchable, deep red, maroon, or purple discoloration.

Another situation in which injury can occur quickly is pressure from a medical device—a problem that's becoming more common as a result of the forms of plastic used in these devices. For example, placing a noninvasive pressure mask over the poorly padded tissue on the bridge of the nose can easily lead to damage.

In other cases, patients may be on a foam or alternating air support surface, so pressure isn't as high against the soft tissue. But these patients also can develop PIs over time because of prolonged tissue ischemia. According to the National Pressure Ulcer Advisory Panel (NPUAP), a stage 1 PI has intact skin with a localized area of nonblanchable erythema, but you won't initially see the color changes evident with deep-tissue PI. If ischemia continues, tissue destruction and deformation, along with color changes, will occur. (For a description of all the NPUAP stages, go to bit.ly/2v0anfX.)

You can help prevent PIs by following three evidence-based practice steps.

#### Determine risk level

Medical-surgical patients at high risk for PIs include those with confusion, malnutrition, or limited mobility (bed- or chairbound). To best assess risk level, use a reliable tool such as the Braden Scale for Predicting Pressure Sore Risk. The Braden scale measures the impact of six subscales: sensory perception (ability to respond meaningfully to pressure-related discomfort), moisture, activity, mobility, nutrition, and friction and shear. You'll score patients in each category, and then add the category scores to establish the overall risk assessment—mild, moderate, high, or severe.

The areas of risk described by the Braden tool subscales are generally modifiable with nursing interventions, so you can use them to create a plan of care. For example, you might establish a schedule for turning an immobile patient every 2 hours or recommend enteral feeding for a patient with nutritional deficits. These types of care plans help reduce PI rates because the interventions target the areas of risk.

Keep in mind that the Braden Scale doesn't accurately predict PI in children, critically ill patients, or in patients going into surgery. Instead, use the Braden QD Scale for children, and keep in mind that nearly all PIs that develop in children are caused by medical devices. Two scales that have been used for the operating room are the Scott Triggers Tool and the Munro Pressure Ulcer Risk Scale, although both require further study.

#### **Reduce pressure**

Reducing the risk of PI stems from its two etiologies. Examine the source of pressure and determine how it can be reduced based on whether the patient can move or be moved. If the pressure is high and the patient can't be moved, choose an appropriate support surface (alternating pressure and low air loss) for the bed or chair, or pad the high-risk areas with foam dressings.

In some patients with deep tissue PIs, the risk can't be prevented. For example, a patient who falls and breaks a hip or suffers a stroke and is found on the kitchen floor experiences very intense, unavoidable pressure before arriving on the medical-surgical unit. In contrast, a patient who's going to have a long operation is at highrisk for PI because he or she can't be moved during surgery, but we can reduce pressure intensity with support surfaces and padding.

Patients exposed to low-intensity, long-duration pressures should be turned to allow for reperfusion of ischemic soft tissue. Traditionally, turning frequency is every 2 hours, but this time frame isn't ideal for all patients and depends on the surface, bed, or chair. (See *Proper turning*.) If the patient is conscious and able to move in bed from side to side, encourage him or her to turn off the back every few hours. The lactic acid that collects in the tissue will trigger chemoreceptors in the brain, causing pain that signals the patient to move.

Chair-bound patients who are stable while standing, including older patients who sit in recliners for hours and wheelchair-dependent patients, should stand and march in place for about five steps every hour. Patients who can't stand because of musculoskeletal or neurologic disability should be repositioned into a correct posture every hour while sitting in a chair.

#### **Proper turning**

Turning is a basic nursing skill, but it should be done thoughtfully, using guidelines from the National Pressure Ulcer Advisory Panel.

Base the frequency of patient turning on the characteristics of the support surface and the patient's response, keeping in mind that no support surface completely relieves pressure. Consider premedication for patients who experience significant pain with turning.

Be vigilant about how well a patient is turned, particularly when turned to the side. Check with your hand to be certain that the sacrum is free from the bed. Monitoring systems can help determine whether the patient has been turned far enough to the side so that pressure on the sacrum is reduced.

Each time you turn the patient, assess the skin for any damage. Don't turn the patient onto a body surface that's damaged or still reddened from previous pressure, especially if the area of redness doesn't blanch.

#### Improve pressure tolerance

Sometimes, two patients with the exact same exposure to pressure may not both result in PIs. The lack of injury is related to soft-tissue tolerance to pressure. Tolerance improves when soft tissue is intact, well-perfused, well-padded, and at normal temperature and moisture levels.

Ischemia, which can lead to PIs, won't quickly reverse in patients with peripheral vascular disease, even when pressure is relieved. The oxygen debt continues to climb, and the tissue dies. Ischemic limbs, which will be pale or cyanotic and have weak or absent pulses, thin hairless skin, and thick toenails, need protection from pressure. The heels are the most common area at risk in these patients, so float the legs from the bed surface with heel-offloading devices (boots) or foam dressings. Using a pillow to float the heel off the bed can work if the patient doesn't move and the pillow doesn't collapse under the weight of the leg.

PIs are common over bony prominences because these areas of the body lack padding from adipose tissue. Malnourished patients lack padding throughout the body and develop PIs quickly. In addition, malnourished patients don't heal easily. To reduce pressure in these patients, use a support surface that allows them to immerse into it. Turn malnourished patients frequently and make sure that padding is placed between the knees and ankles. Also, be sure the patient has a nutritional consult to help ensure he or she receives necessary nutrients.

Warm moist skin or skin damaged from exposure to moisture increases the risk of PI. The outer layer of skin absorbs urine and sweat, which leads to macerated skin that's tacky and doesn't glide on linens. Diarrhea burns the skin and pro-*(continued on page 39)* 



# Preventing pressure injuries in medical-surgical patients

How to overcome competing priorities to provide nurse education.

By Catherine Spader, RN

An interview with Jill Cox, PhD, RN, APN-C, CWOCN/ APN, clinical associate professor, Rutgers School of Nursing, Newark, NJ. Cox is also a wound, ostomy, continence (WOC) advanced practice nurse at Englewood Hospital and Medical Center. She serves on the board of directors of the National Pressure Ulcer Advisory Panel.

Medical-surgical (med-surg) units aren't what they used to be, and neither are the methods needed to educate nurses about preventing pressure injuries (PIs). Keeping the staff of these busy units up to date with the most recent PI prevention practices requires vigilance and ingenuity.

"Educating nurses is always a challenge because we have so many competing educational priorities in the med-surg setting, including falls prevention, infection control, and the latest innovations and practices," Cox says.

#### High acuity, high risk

High patient acuity also competes with educational demands for every moment of a med-surg nurse's valuable time. Ironically, many factors that keep these nurses so busy are the same ones that increase the risk of PIs. "Med-surg patients have so many comorbidities that increase risk," Cox says. "The ICU [intensive care unit] patient of the late 1980s is often the med-surg patient of today."

Patients who require extra diligence to prevent PIs include those transferred from long-term care (LTC) facilities and the ICU. They often have myriad acute and chronic conditions—including nutritional deficiencies, cognitive impairment, limited mobility, numerous comorbidities, and a history of lengthy or multiple surgeries that put them at high risk for PIs.

"Patients transferred from the ICU are beginning to overcome a critical illness, which can place them at higher risk for pressure injuries," Cox says. "Recognizing this when they're transferred to the med-surg unit is important." Med-surg nurses also need to be aware of nutritional deficits of patients transferred from the ICU or an LTC. "This puts them at high-risk, and I think it's underappreciated and understudied in terms of how much of a risk that can be," Cox says.

#### Education on the fly

Unique approaches are needed to ensure busy medsurg nurses learn and retain vital information to prevent Pls. Cox believes that the key is to educate creatively, be flexible, and meet med-surg nurses where they are. "Nurses are stretched and don't have time anymore to attend lengthy on-unit in-services," Cox says.

She uses a combination of strategies to boost learning and retention, including online self-guided modules and classroom sessions during the orientation process. Staff nurses also are required to complete mandatory education on PIs as part of their annual competency requirements.

Cox has investigated whether a difference exists between a traditional classroom lecture and computer-

#### Effective performance improvement

Every quarter, the med-surg council members at the Englewood Hospital and Medical Center monitor compliance with the facility's Skin Integrity Protocol, looking for recurring concerns.

"We do have some recurring themes," says Jill Cox, PhD, RN, APN-C, CWOCN/APN, WOCN advanced practice nurse at the hospital, "such as issues with heel elevation and the use of chair cushions."

Cox is always looking for innovative ways to translate performance improvement into effective pressure injury (PI) prevention education for the staff. In this case, she helped develop a campaign for the use of chair cushions designed to prevent PIs. Using a staff nurse as a model, she demonstrated "Five things you can do with a chair cushion" to prevent PIs, including proper heel elevation. based instruction in PI knowledge retention. The study revealed that computer modules, which can be completed when nurses have time, are a viable option. Quarterly education to maintain knowledge also was recommended.

In addition, Cox uses teaching tools to educate nurses during their day-to-day practice. These tools include:

- posters that display easily digestible bites of information, highlighting key educational points
- smaller signs that target a specific topic (signs have included pictures that illustrate the difference between PI and incontinence-associated dermatitis)
- pictures that guide nurses in the proper selection of a bed/mattress when the WOC nurse isn't available. "It's education on the fly. It's the way nurses flow today," Cox says.

#### PI prevention protocol

Englewood Hospital and Medical Center has a comprehensive Skin Integrity Protocol based on the National Pressure Ulcer Advisory Panel guidelines.

As a Magnet<sup>®</sup>-recognized organization, Englewood participates in the National Database of Nursing Quality Indicators prevalence tracking for PIs. Data collection, which is conducted by staff nurses, includes tracking the admission PI risk and skin condition for all patients in the med-surg and critical-care areas. In addition, nurses conduct a skin assessment, risk assessment, and evaluation of the prevention strategies in use on the day of data collection.

"Consistent risk assessment is crucial," Cox says. "In our facility, this includes performing a repeat Braden scale [Braden Scale for Predicting Pressure Sore Risk] every shift."

The Skin Integrity Protocol also addresses:

- standard preventive care
- Pl staging
- topical therapies indicated for treatment of each PI stage
- support surface and specialty bed selection.

"When patients are admitted, nurses have the ability to start topical treatment based on the protocol and can order a WOC nurse consult," Cox says. "Using this protocol provides them with elements of pressure injury treatment so patient care isn't delayed."

All PI dressing supplies are stored on the unit for easy nurse access, which saves time and expedites care. In addition, nurses can order specialty beds or mattresses when the WOC nurse isn't available and a specialty surface is deemed appropriate. These products are generally used for:

- stage 3 or 4 Pls
- unstageable wounds
- any patient the nurse believes may be at high risk for PI.
  - "I always tell the nurses, if in doubt, go ahead and or-

#### How to stage a pressure injury



According to the Scope and Standards of Nursing Practice, staging pressure injuries is an assessment skill that RNs can perform. You can find more information at the National Pressure Ulcer Advisory Panel (NPUAP) web site:

#### NPUAP pressure injury stages

npuap.org/resources/educational-and-clinical-resources/ npuap-pressure-injury-stages/

#### Pressure injury staging illustrations

npuap.org/resources/educational-and-clinical-resources/ pressure-injury-staging-illustrations/

### Frequently asked questions about pressure injury staging

npuap.org/resources/educational-and-clinical-resources/ complimentary-educational-webinars/

#### National Pressure Ulcer Advisory Panel position paper on staging pressure ulcers

npuap.org/wp-content/uploads/2012/01/NPUAP\_ position\_on\_staging-final.pdf

#### **Other resources**

#### 2014 Prevention and treatment of pressure ulcers: Clinical practice guideline

npuap.org/resources/educational-and-clinical-resources/ prevention-and-treatment-of-pressure-ulcers-clinicalpractice-guideline/

The Braden Scale—for predicting pressure sore risk in.gov/isdh/files/Braden\_Scale.pdf

der the mattress," Cox says. "We can always remove it if necessary, which we rarely do."

The benefit of the Skin Integrity Protocol is threefold, according to Cox. "It's educational, it drives nursing care, and it standardizes care in med-surg and critical care."

#### Education = prevention

PI prevention education in the med-surg unit must meet the needs of busy staff nurses. Flexible learning opportunities, collaboration with WOC nurses, and a PI protocol can enhance staff nurse understanding of PIs and increase knowledge retention. The end result is improved PI prevention in high-risk patients.

Catherine Spader is a medical and healthcare writer and editor in Littleton, Colorado.

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# Preventing pressure injuries in critically ill patients

Evidence-based care bundles improve patient safety and prevent pressure injuries.

By Peggy Kalowes PhD, RN, CNS, FAHA

o amount of clinical care in the world can improve the health and quality of a patient's life if the approach to care or the environment isn't safe. Intensive care unit (ICU) clinicians face a difficult but essential task: Provide comprehensive, compassionate, complex, technological care without inducing harm, such as pressure injuries (PIs). While most hospital-acquired conditions are preventable, their frequency and potential adverse effects increase in critically ill patients because of hemodynamic instability that leads to immobility, reduced immune response, and multisystem organ dysfunction. To promote a safe patient environment, we must foster multidisciplinary competency among ICU staff and embrace evidence-based guidelines and care bundles to manage critically ill patients.



#### **Evidence-based care bundles**

Care bundles help to reduce variation and improve outcomes. Typically, they have three to five evidence-based practices that are delivered collectively and consistently. (See *Care bundle ele-*

#### Care bundle elements

Care bundles have several key elements.

- Three to five evidence-based interventions related to a condition or event in patient care that when implemented together result in a better outcome than if they were executed individually.
- Wide acceptance of each intervention as good practice with broad application.
- Bundle adherence for all applicable patients.
   Bundle interventions used to measure evidencebased practice and organizational outcomes.
- Each step is measured through audits.
- Adherence requires completion of every intervention; if a step is eliminated, it must be for a predetermined reason.

*ments.*) All patients who meet the criteria for the bundle should receive all of the interventions, unless medically contraindicated.

Care bundles can be used for many conditions, but this article will focus on preventing PIs in critically ill patients using a care bundle supported by 2014 National Pressure Ulcer Advisory Panel (NPUAP) guidelines and evidence-based references. (See *Skin care bundle*.)

#### **PI-prevention care bundle**

The NPUAP defines a PI as "localized damage to the skin and/or underlying soft tissue, usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be very painful." In 2014, several national and international organizations developed or endorsed evidence-based guidelines for PI prevention and treatment. Here are highlights from five of the most common.

#### 1. Risk

The first step in preventing PI is determining what constitutes risk. PIs are the result of pressure or pressure in combination with shear. Identifying patient characteristics associated with increased risk will help determine the patient's clinical risk score. (See *PI risk stratification.*) The Braden Scale for Predicting Pressure Sore Risk—a reliable tool for quantifying PI risk—assesses mobility, moisture, friction and shear, nutrition, and activity. Other factors that increase PI risk in the ICU include length of stay, spinal cord injury, vasopressor infusions, mechanical ventilation, and hemodynamic instability.

#### 2. Surfaces

Support surfaces are specialized devices (integrated bed systems, mattresses, mattress replacements, overlays, and seat cushions) for redistributing pressure to either increase the body surface area that comes in contact with the surface (to reduce interface pressure) or to sequentially alter the parts of the body that bear load (to reduce the duration of loading on individual anatomical sites). Select a support surface based on evidence, the care setting, and specific patient needs. Always consider the patient's level of immobility and inactivity; need for microclimate control and shear reduction; risk for developing a new PI; size and weight; and number, severity, and location of existing PIs.

The Wound Ostomy and Continence Nurses Society (WOCNS) has developed an evidenceand consensus-based support surface algorithm to guide clinicians when evaluating a patient's need for pressure redistribution (bit.ly/2GSi65i).

Other important (and practical) considerations include bed weight, unit structure, door width, availability of uninterrupted electrical power (develop a contingency plan in case of power failure), and safe location for the pump/motor and ventilation. Every day, examine the appropriateness and functionality of the support surface for each patient so you can prevent and identify potential complications.

To prevent prolonged pressure while patients with reduced mobility are sitting in a chair, select a pressure-redistributing seat cushion. Redistribution is achieved by immersion/ envelopment or redirection/off-loading. Use alternating pressure devices judiciously for patients with existing PIs. Weigh the benefits of off-loading against the potential for instability and shear based on the construction and operation of the cushion.

#### Skin-care bundle

Using a skin-care bundle ensures patients receive the necessary evidence-based interventions to prevent pressure injuries (PIs). Start by determining the patient's clinical risk for PI by using a valid, standardized risk assessment tool. Conduct a comprehensive skin assessment and documentation as part of the risk stratification, then deploy the SKIN (surface, keep turning, incontinence, nutrition) bundled interventions from the National Pressure Ulcer Advisory Panel's clinical practice guidelines.

#### Surface selection

- Specialty mattress beds
- Overlays with alternating support and tissue relief, low airloss performance to control microclimate
- Chair cushion with alternating air flow/nodal support

#### Keep turning

- Reduce immobility
- Reposition at least every 2 hours.
- Off-load heels.
- Place multilayer silicone foam dressings at pressure points for shear redistribution, friction reduction, microclimate balance.

#### ncontinence management

- Perform perineal care every 2 hours.
- Use moisture barriers.
- Use incontinence pads (avoid diapers) for excessive stool and urine.
- Correct the problem.

#### Nutrition

- Obtain early dietary consult for high-risk patients.
- Assess for nutritional deficits.
- Implement care plan to improve nutritional status.

Adapted from Gibbons W, Shanks HT, Kleinhelter P, Jones P. Eliminating facility-acquired pressure ulcers at Ascension Health. *Jt Comm J Qual Patient Saf.* 2006;32(9):488-96.

**CLINICAL ALERT** Repositioning is still required for pressure relief and comfort when using a support surface. Consider early mobility strategies when possible.

#### 3. Turning

Repositioning and early mobilization are essential for prevention and treatment of PIs, particularly among critically ill patients. Historically, though, many clinicians resisted early turning, repositioning, or progressive mobility in the ICU based on concerns that they may cause or exacerbate hemodynamic changes. Other obstacles include fear of dislodging vital equipment (such as endotracheal tubes, arterial lines, and cannulation sites), use of sedatives and benzodiazepines, staff availability, previous attempts, and culture of the unit.

#### **PI risk stratification**

Risk stratification using a valid, reliable tool helps clinicians identity high-risk patients so they can apply select, evidencebased care bundle interventions. Perform pressure injury (PI) risk assessment at admission, daily, and whenever the patient's condition changes.

#### Risk factors for PIs in critically ill patients

Risk factors	Effects
Prossure	<ul> <li>Increased duration of pressure causes local tissue ischemia, edema, and ultimately tissue death.</li> <li>Pls can occur at any body site where skin and soft-tissue loading is prolonged or excessively high.</li> </ul>
Immobility	<ul> <li>Places unrelieved pressure on affected bony prominences.</li> </ul>
Moisture (microclimate)	<ul> <li>Moisture contributes to maceration of epidermis, which makes tissue more vulnerable to pressure.</li> <li>Enzymes in fecal material can erode epidermal layers.</li> </ul>
Friction/shear	<ul> <li>Removes epidermal layers, reducing the number of layers protecting dermal tissue.</li> </ul>
Nutrition	<ul> <li>Decreased protein alters oncotic pressure and makes tissue prone to edema.</li> </ul>
Advanced age	<ul> <li>Decreased subcutaneous fat reduces protection from pressure effects.</li> <li>Sensory deficits decrease cues to change position.</li> </ul>
Low blood pressure (hemodynamic instability)	<ul> <li>Increases local tissue responses.</li> <li>Turn to avoid "gravitational equilibrium"; provide mini-turns.</li> </ul>
Duration of mechanical ventilation	<ul> <li>Indicates need to provide ventilation and oxygen.</li> <li>Lowers oxygen levels in arterial blood and decreases oxygen going to tissue.</li> <li>Extracorporeal membrane oxygenation (often used to improve ventilation) limits mobility.</li> <li>Provide mini-turns.</li> </ul>
Vasoactive medication	<ul> <li>Decreased blood pressure leads to poor tissue perfusion.</li> <li>Vasoactive medications to improve blood pressure cause vasoconstriction and may decrease perfusion of distal tissues, such as skin.</li> </ul>
Length of stay in intensive care unit	• Duration of critical illness is associated with PI development because of inability to change position and increased shear forces from sliding down in bed.

Growing evidence supports turning critically ill patients slowly or using mini-turns (weight shifting at least every 30 minutes) while monitoring patient response. Use safe practices while turning critically ill patients, particularly those with ventilators and multiple invasive lines.

The task of turning, repositioning, and mobilizing ICU patients requires multidisciplinary collaboration. Increasing mobility in ICU patients can prevent and aid in treating PIs, reduce length of stay, and improve overall morbidity and mortality.

**CLINICAL ALERT** Determine repositioning frequency based on individual tissue tolerance, level of activity and mobility, general medical condition, overall treatment objectives, and skin condition.

#### 4. Incontinence

Urinary or fecal incontinence can lead to moist skin and increase the risk for PIs, so develop and implement individualized continence management plans for acutely ill patients. If possible, avoid placing indwelling urinary catheters, which can lead to catheter-associated urinary tract infections. Follow these evidence-based practice recommendations:

Cleanse the skin regularly and provide perineal care at least every 2 hours and as needed. Wash an incontinent patient's skin regularly. It's best to use perineal cleansers because they're specifically designed to remove urine and fecal matter without irritating the skin. Put the cleanser on a clean washcloth and apply it directly to the skin; rinse the area with lukewarm water.

Use a barrier cream. These creams create a barrier between the skin and moisture (urine and feces). Barrier creams that contain zinc oxide, petrolatum, or lanolin provide good protection.

Change incontinence products regularly. If incontinence persists, incontinence pads are preferred (don't use diapers) over indwelling urinary catheters. Change pads as often as necessary.

Assess skin integrity regularly. Inspect high-risk patients' skin regularly for changes and erythema. Check under incontinence products at least every 2 hours for signs of redness and irritation. If you see irritation, address it immediately. Keep the area clean with warm water and mild soap, and use appropriate skin care products.

**CLINICAL ALERT** Understanding the various types of incontinence will help you deploy the appropriate skin-care therapies.

(continued on page 40)



# Critical care of the skin

# Two-person skin assessment builds a foundation for pressure injury prevention.

By Catherine Spader, RN

An interview with Debra Crawford, BA, ADN, RN, CWOCN, CFCN. Crawford is the team and wound, ostomy, continence (WOC) nurse at Mercy Health Saint Mary's Campus in Grand Rapids, Michigan.

Intensive care unit (ICU) nurses face many challenges when caring for their patients and must sometimes focus on immediate life-saving interventions. Unfortunately, protecting the skin can get bumped down the priority list and lead to serious problems later.

"The skin is the largest organ in the body and deserves a lot of attention," says Crawford. "When it breaks down, patients are prone to infection—and people can die from infection—so we can't forget it."

Another concern is that the Centers for Medicare and Medicaid Services (CMS) doesn't reimburse for the treatment of hospital-acquired stage 3 and 4 pressure injuries (PIs). "In the ICU, we can no longer save a patient's life today and worry about the skin tomorrow," Crawford says.

### The process: Two sets of eyes are better than one

PI prevention in the ICU at Mercy Health Saint Mary's Campus begins the moment a patient is admitted. All

#### Patient spotlight: The takeaway

The intensive review process at Mercy Health Saint Mary's Campus has provided valuable insight into the causes and prevention of pressure injuries (PIs). For example, one middle-aged male patient was in so much pain after his leg surgery that he didn't want to move. The result: an avoidable PI on his heel. The review process determined that he didn't receive adequate pair medication to turn and position him properly.

"He got angry when anyone tried to relieve the pressure on his heels," says Crawford, "but if we had been on top of his pain medication, we could have prevented it. That's the kind of thing that we can bring out in our review process and is a good takeaway for the nursing staff."



patients receive a two-person nursing assessment that includes examining the entire skin. The assessment is repeated when a patient is transferred to another unit, and anytime a patient has been off a unit for more than 2 hours.

Risks are also evaluated and documented. Factors that make ICU patients especially vulnerable to PI include:

- some critical-care drugs, such as vasopressors, which can cause ischemia and tissue necrosis
- decreased level of consciousness
- lack of mobility and difficulty turning
- use of multiple medical devices that can cause pressure on the skin, such as respiratory devices and automatic blood pressure cuffs
- hemodynamic instability that's worsened with physical movement
- history of surgery lasting longer than 3 hours
- need to leave the ICU for long periods, such as for dialysis or imaging procedures
- poor nutritional status before admission and possibly during hospitalization.

After each assessment, ICU nurses flag at-risk patients and those with skin changes in the electronic health

#### Skin champions

Having a unit-based skin champion is critical to a successful PI-prevention program. At Mercy Health Saint Mary's Campus, staff nurses who learn best practices are highly effective skin champions in the ICU, as well as in medical-surgical, perioperative, and other units, according to Cox.

One advantage is that skin champions engage their fellow staff nurses peer-to-peer. They also advocate for performance improvement, serve as on-the-spot resources, and motivate other staff nurses to take personal ownership in preventing PIs.

record for a consult with a WOC nurse. "Sometimes it turns out to be nothing of concern, like a mole," Crawford says, "but I would rather the nurses be vigilant than let anything questionable go."

#### The review: Diving deep

Despite the ICU's best efforts, not all PIs are avoidable, according to Crawford. Unfortunately, no CMS criteria exist to determine if a PI was preventable. When a PI occurs at Mercy Health Saint Mary's Campus, a collaborative team performs an intensive deep-dive review to determine if it was preventable. The team includes:

- clinical nurse specialists and leaders
- department manager and other hospital leadership
- WOC nurses
- unit skin champions
- nutritionist
- risk-management representative.

The review process includes the Indiana University Health Pressure Ulcer Prevention Inventory, which is an objective tool that determines if a PI could have been prevented. It includes these elements:

- Braden Scale for Predicting Pressure Sore Risk
- documented staff assessments
- whether appropriate interventions were performed based on the assessments.
  - "The Indiana University Health Pressure Ulcer Preven-

#### Are all PIs avoidable?

According to the 2010 National Pressure Ulcer Advisory Panel Consensus Conference, not all pressure injuries (Pls) are avoidable. With unanimous consensus, the panel declared that most—but not all—Pls are avoidable. The panel also determined that Pls may occur in some cases when a patient's condition and risk status was thoroughly assessed, and appropriate interventions, evaluation, and revision of interventions were taken.

You can find more information at o-wm.com/content/ pressure-ulcers-avoidable-or-unavoidable-results-nationalpressure-ulcer-advisory-panel-cons tion Inventory minimizes subjectivity in judging whether our staff is doing a thorough job," Crawford says. "We don't encounter any surprises, and we've found that some PIs were unavoidable."

#### SCALE: Skin changes at life's end

The review process also may include assessing the patient for skin changes at life's end (SCALE), which considers physiologic changes that occur during the dying process that may affect the skin and soft tissue. These changes may be unavoidable and occur regardless of interventions that meet or exceed the standard of care. This assessment may be appropriate when a patient is declining rapidly or is transferred to hospice care while in the hospital.

#### The key: Staff nurses

ICU staff nurses play a vital role in the deep-dive review process. They present their insight about the patient using the situation, background, assessment, and recommendation (SBAR) technique, which facilitates brief, organized, and clear communication about the patient.

"Not every detail gets documented in the chart," Crawford says, "SBAR allows nurses to provide the real-world view, and their perspective of the patient and the situation."

The team then presents the facts from the documentation, and they determine what can be done to prevent similar incidents in the future. Their findings are shared in written, photographic, and verbal form with leadership and all units.

#### **Prevention: Build a foundation**

Crawford believes that an effective review process and Plprevention program is built on the foundation of the twoperson skin assessment upon admission. "If you do your due diligence in the beginning, then you can say with certainty where the injury occurred, and investigate and address how it could have been prevented," she says.

Catherine Spader is a medical and healthcare writer and editor in Littleton, Colorado.

#### RESOURCES



National Pressure Ulcer Advisory Panel.

Best Practices for Prevention of Device-related Pressure Injuries in Critical Care

npuap.org/wp-content/uploads/2013/04/Updated-Best-Practices-CriticalCare2017.pdf

Pittman J, Beeson T, Terry C, et al. Unavoidable pressure ulcers: Development and testing of the Indiana University Health Pressure Ulcer Prevention Inventory. *J Wound Ostomy Continence Nurs.* 2016;43(1):32-8.

#### SCALE: Skin Changes at Life's End

woundsresearch.com/content/scale-skin-changes-life% E2%80%99s-end

# Preventing pressure injuries in the operating room

Be proactive to avoid perioperative pressure and peripheral nerve injuries.

By Rebecca J. McKenzie, DNP, MBA, MSN, RN, and Candace Ramirez, MSN, RN

ospital-acquired pressure injuries (PIs) are detrimental clinically and emotionally for the patient, and they negatively impact the hospital's bottom line. Perioperative patients are at particularly high risk for developing PIs. As a member of the perioperative team, you play a critical role in preventing injuries that result from poor body positioning and medical device placement.

#### **Pls in the OR**

The incidence of intraoperatively acquired PIs is estimated to be from 12% to 66%. Contributing factors may be intrinsic (comorbidities such as diabetes, peripheral vascular disease, obesity, impaired perfusion, poor nutritional status, cancer, fractures, immobility, infection, impaired sensory perception, neurologic disase, age [very young or very old], abnormal body mass) or extrinsic (temperature, moisture, friction, shear). Injuries occur when the load on the tissue is greater than the tolerance or load the tissue can bear. Extrinsic risk factors impede tissue perfusion and increase tissue susceptibility to external pressure.

Patients presenting with PIs within 72 hours of surgery are determined to have an intraoperatively acquired PI. Although every patient undergoing surgery is at risk for a PI, the length of the surgical procedure is a significant factor. Research indicates 23% of PIs are acquired during procedures that last more than 3 hours. Other risk factors include type of surgery, patient positioning, use of positioning devices, instrumentation (retractors), anesthetic agents, vasoactive medications, and intraoperative hemodynamics.

PIs resulting from medical devices may be related to device material (rigid materials), placement (on areas at risk for damage, such as those with little adipose tissue), securement (how the device is fastened to the body), and obscured visibility (placement may block nurse's view or create risky microclimate).

In addition to extending a patient's hospitalization, PIs also increase vulnerability to infection and additional clinical complications, such as necrotizing soft-tissue infections, cellulitis, and sepsis. PI recovery may take months and involve extensive therapies, pain management, and emotional support.



#### **Peripheral nerve injuries**

Pressure also can lead to peripheral nerve injuries (PNIs). Considered preventable, PNIs occur in nearly 20% of surgical procedures and are the result of obstructed intraneural blood vessels, which affect sensory or motor pathways. They're typically attributed to improper patient positioning during the surgical procedure. PNI severity varies depending on associated factors, including how the force was applied, amount of force, and the length of time the force was applied. Nerves may be damaged when stretched even minimally, and sensory nerve damage may occur during as little as 15 minutes of compression, ischemia, or stretching; motor nerve injuries may occur in as little as 1 minute. (See *PNI facts.*)

#### **PNI facts**

Several factors may contribute to perioperative peripheral nerve injuries (PNIs), including:

- length of surgery
- amount and length of force applied to the nerve
- patient comorbidities
- instrumentation (such as retractors) and medical devices (such as securement devices for I.V.s and endotracheal tubes)
- patient position and positioning devices (such as stirrups and leg holders)
- location of surgical incision.

#### Surgical positions

Some nerves (peroneal, ulnar, brachial plexus) are at greater risk than others for PNI, primarily due to the required patient position. Surgical positions most commonly associated with PNI include lithotomy (compresses and stretches peroneal and femoral nerves) and supine (impacts brachial plexus and ulnar nerves). Other positions associated with PNIs include lateral, prone, park bench, and Fowler.

#### **PNI** outcomes

PNI outcome depends on the area affected. Sensory nerve injuries present as tingling, numbness, burning, or pinching. Motor PNI symptoms include numbness, tingling, pain, or difficulty with motor skills, including walking or grasping objects. PNI recovery can take days or as long as a year, depending on severity. Treatment, which can be expensive, includes physical and occupational therapies and rehabilitation programs. In some cases, the PNI doesn't resolve, and the patient is permanently injured.

#### **AORN** guideline

The Association of periOperative Registered Nurses' (AORN) Guideline for Positioning the Patient includes the following recommendations:

- Complete a preoperative risk assessment to proactively identify risk for pressure injuries (PIs).
- Identify, select, and use appropriate positioning devices (including pressure-redistribution support surfaces) and prophylactic dressings to prevent PIs on areas at risk for pressure, friction, and shear
  - a. Patient should be in the prone position for the shortest time possible and should be positioned in 5- to 10-degree reverse Trendelenburg, if possible.
- b. In the supine position, the patient's knees should be flexed approximately 5 to 10 degrees, and the heels should be elevated off the underlying surface using a suspension device.
- Use special precautions when positioning patients who are pregnant or obese.
- Complete a postoperative assessment to identify whether a PI has occurred.

#### **Ongoing assessment**

Because all surgery patients are at risk for developing PIs and PNIs, perioperative staff must assess patients before, during, and after procedures. Two risk assessment tools can help guide you in identifying at-risk patients. The Munro Scale is an identification, documentation, and communication tool designed to help standardize the risk assessment process. The scale tracks body mass index (BMI), body temperature, height, weight, and the presence of hypotension. The Scott Triggers tool is a predictor of potential PI in high-risk patients identified by age, serum albumin levels or BMI, American Society of Anaesthesiologists score, and estimated surgery time. Both tools are part of the Association of periOperative Registered Nurses (AORN) Prevention of Perioperative Pressure Injury (PPPI) Tool Kit.

During surgery, the circulating nurse should periodically assess the patient's skin as much as the surgical procedure permits. After surgery, the nurse should perform an assessment and share the results with the postanesthesia care unit (PACU) staff. PACU staff should continue the assessment and implement any necessary prevention strategies, such as mattress overlays.

#### Prevention through positioning

PI and PNI prevention in the operating room (OR) begins with proper patient positioning using AORN and other professional organizations' best practices. (See *AORN guideline*.) Patient positioning is the responsibility of the entire team, including surgeons, nursing staff, anesthesiologists, and ancillary personnel. By working collaboratively, the team can ensure the use of appropriate devices based on the patient's position, length of surgery, and other critical factors.

Staff education about proper positioning should include injury risk and evidence-based protocols known to prevent and reduce injury. Moving patients from the stretcher to the OR bed requires adequate assistance to avoid friction and shear and to stabilize the body and extremities. Position the patient to allow for adequate visualization and exposure of the surgical site, ensure patient privacy and comfort, allow for access and visualization of the monitoring equipment and I.V. lines, provide optimal ventilation support, promote tissue perfusion and circulation, and stabilize the patient to avoid unintended movement. The OR team must ensure body weight is evenly distributed, and that bony prominences, which are most vulnerable to injury, are protected. Recent evidence reveals that when a patient is in a

supine position, elevating the heels off the surface may create complications caused by hyperextension of the knees, placing the patient at risk for deep vein thrombosis. To avoid this complication, AORN recommends using a heel-suspension device and positioning the patient's knees in a 5to 10-degree flexed position. If possible, patients placed in Trendelenburg, lithotomy, and prone positions should be repositioned during surgery at predetermined intervals.

Consider pressure-reducing surfaces based on the type of procedure, length of surgery, and patient comorbidities. (See *Pressure-reducing surfaces*.) Although the literature indicates surgical surfaces may reduce the possibility of PI, the best outcome overall is to minimize the intrinsic and extrinsic risk factors.

Positioning devices such as pillows and foam wedges also may be used to assist with patient positioning and protect areas subject to pressure during the procedure. However, if these devices aren't used appropriately or monitored closely, they may create additional pressure points and cause nerve compression.

Using neurophysiological monitoring during surgery may identify potential positioning injuries. The monitor's alarm is triggered by possible nerve compromise, alerting the OR team so they can implement PI prevention interventions. However, don't rely solely on the monitor; continue with regular physical assessments throughout the procedure.

#### Improving outcomes

Robust, evidence-based practice initiatives associated with awareness, education, and care of surgical patients most at risk for PIs have helped to improve outcomes. Identifying high-risk patients before surgery and optimizing their condition through enhanced nutrition, mobility, diabetes management, and other measures may reduce the overall incidence of PIs and PNIs in surgical patients. PI risk assessment tools, prevention protocols, and care guidelines help OR nurses determine patient risk and implement prevention protocols.

The authors work in perioperative services at Duke University Hospital in Durham, North Carolina. Rebecca J. McKenzie is assistant vice president, and Candace Ramirez is nurse manager.

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#### **Pressure-reducing surfaces**

Using pressure-reducing surfaces (polyurethane and polyether mattresses and alternating-pressure mattresses) decreases pressure compared to standard operating room (OR) foam and gel mattresses. In addition, air and gel overlays may reduce pressure injuries in some surgical procedures that last longer than 3 hours, particularly when compared with standard OR mattresses. When choosing a surface, look for ones that come in different shapes so they can be used for a variety of procedures. In addition, be sure the surface can be easily cleaned.

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# Making strides in OR pressure injury prevention

# Best practice combines knowledge, devices, and good nursing care.

By Catherine Spader, RN

An interview with Kristen Oster, MS, RN, APRN, ACNS-BC, CNOR, CNS-CP, clinical nurse specialist in perioperative services at Porter Adventist Hospital in Denver, Colorado.

risten Oster will never forget a patient she cared for as a new graduate nurse. He was a man in his mid-50s who'd had major surgery and had to be put in a medically induced coma. When he woke up, he had extensive pressure injuries (PIs) on his sacrum and coccyx that were open to the bone. He required a lot of extra care and multiple procedures, including flap repairs to replace lost tissue.

"He was very traumatized, and I always think about him," Oster says. "Severe pressure injuries can cause serious long-term harm, including chronic wound issues, pain, additional healthcare costs, and emotional suffering."

That alarming experience helped shape Oster's future nursing career. Today, Oster is a perioperative clin-

## 5 pressure injury prevention tips for the OR

- Know your patient's pressure points; pad and position to relieve the pressure.
- <sup>2</sup> Understand proper body alignment for specific patients.
- 3 Always do a final check of your patient's position before the procedure begins.
- Remember that just because a patient's position is out of sight during surgery, it should not be out of mind.
- Use alternating-pressure overlays as an adjunct—not a replacement—for good nursing care.

ical nurse specialist, and preventing surgical PIs is her passion.

#### Not your typical high-risk patient

Oster works with the head-and-neck surgical population at Porter Adventist Hospital. Many of her patients have cancer and a high risk for PIs because of lengthy procedures. The surgical cancer population's risk is also compounded by such factors as:

- chemotherapy
- low body mass index (BMI)
- nutritional deficits
- radiation therapy.

"Many patients with cancer have nutritional deficits and their BMI is low, which is an intrinsic risk factor for pressure injury development," Oster says. "Underweight patients don't have the padding needed to cushion and protect bony prominences."

Most head-and-neck surgeries at the hospital are performed with patients in a supine position or slightly lateral to expose the neck or behind the ear for a skullbase procedure or craniotomy. Ideal positioning and moving patients isn't always an option. For example, dissecting an acoustic neuroma may require a patient to remain in one position for 8 to 9 hours, depending on the size and location of the tumor, Oster says.

In addition, some patients who would normally be considered low risk for PIs can become high risk when undergoing head-and-neck procedures. For example, Oster cites the 2015 case of a relatively healthy man in his mid-40s. "He wasn't your typical high-risk patient," she says.

The patient was scheduled for a diagnostic neck dissection to determine if he had cancer. He wasn't considered high-risk at admission, but the dissection revealed an extensive tumor, and the planned 3-hour procedure became an 8-hour procedure that included a total laryngectomy. The patient ended up with bilateral PIs on his heels.

#### A pilot to tackle PI prevention

After the heel PIs in the low-risk patient, Oster gathered a multidisciplinary team to improve PI prevention in the operating room. The team—a surgeon, a clinical nurse specialist, and an assistant nurse manager—reviewed the facility's surgical head-and-neck cases. They found another PI and a sacral injury, which occurred after a long procedure. All of the injuries had happened within the previous 2 years.

The team then performed a gap analysis to compare their actual PI prevention performance with their desired performance. They discussed what they were currently doing, as well as National Pressure Ulcer Advisory Panel (NPUAP) and Association of periOperative Registered Nurses (AORN) best practice guidelines. "We identified a need for increased vigilance and [improved] pressure injury prevention methods," Oster says.

Next, the team investigated and evaluated measures to help reduce PIs. They selected an alternatingpressure overlay as a potential prevention method. The overlay, which is applied over the OR table mattress, uses alternating nodes to reduce pressure and improve circulation.

"The overlay is a great addition to pressure injury prevention because it offers micropressure release that simulates turning patients," Oster says. "It doesn't affect the procedure or disturb the surgeon because it doesn't move the patient."

The team then met with key stakeholders, including head-and-neck surgeons, supply chain staff, the director of perioperative services, and wound, ostomy and continence nurses (WOCNs). They determined that the overlay could benefit patient care and developed a pilot program to implement it. Before the pilot kick-off, the team developed educational material about the overlay and distributed it to perioperative staff.

#### **Pilot results**

Oster presented a poster of the pilot project—"Piloting an alternating pressure overlay to mitigate pressure injury"—at the 2017 AORN Surgical Conference and Expo. Use of the overlay was studied in 109 head-and-neck surgical patients from September 2015 through September 2016. The average patient age was 58, and the average surgical time was 5 hours, 37 minutes. During the pilot, PI occurrence dropped from three injuries before implementation (two heel injuries, one sacral injury) to zero injuries. The pilot study concluded that, when used properly, an alternating-pressure overlay can be a useful addition to PI prevention in the perioperative setting.

#### The issue of cost

Oster's study also found that using the overlay can save money. For example, treating a stage II or greater PI costs a facility \$43,180. The price tag can compound quickly. Treating three PIs can cost an organization more

#### RESOURCES



#### 2014 Prevention and treatment of pressure ulcers: Clinical practice guideline

npuap.org/resources/educational-and-clinical-resources/ prevention-and-treatment-of-pressure-ulcers-clinicalpractice-guideline/

Prevention of perioperative pressure injury

aorn.org/guidelines/clinical-resources/tool-kits/ prevention-of-perioperative-pressure-injury-tool-kit

than \$120,000, according Oster.

"It costs less to buy and use overlays as a preventive measure than to pay for treatment when a pressure injury occurs," Oster says. "And that doesn't even include saving the patient from the emotional, psychological, and physical trauma of a pressure injury."

#### An indicator of nursing care

Porter Adventist Hospital was one of the first hospitals to pilot the alternating pressure overlay, resulting in best practice changes at the facility. And Oster says that, based on the new data, NPUAP changed its recommendations. The old recommendation was to use the overlay for surgeries of 4 hours or more; the new recommendation is surgeries of 3 hours or more.

The perioperative nurses at Porter Adventist Hospital are using the overlay with patients undergoing even shorter surgeries. They use their assessment and critical thinking skills to determine if it might be beneficial to certain patients, such as those with paralysis or other mobility issues.

Despite the success of the overlay, Oster stresses that it's an adjunct—not a replacement—for good nursing care. It should be used in conjunction with the best practice guidelines from AORN.

"If a patient gets a pressure injury, it may mean nursing could have done better," Oster says. "Nurses need to know what best practice is. They must be knowledgeable about positioning, pressure points, types of positioning devices and their proper use, and they have to advocate for their patients."

Meticulous nursing care is especially vital for special populations, such as head-and-neck cancer patients, according Oster. "They have so many challenges, including having multiple procedures that are life altering and physically and emotionally traumatic," she says. "For some, it's about quality of life and not quantity; the last thing they need is a pressure injury. What we do by preventing pressure injuries is give them a better quality of life."

Catherine Spader is a medical and healthcare writer and editor in Littleton, Colorado.



# Changing times and perioperative pressure injury prevention

Longer surgeries and new patient populations require a keener focus on prevention.

By Catherine Spader, RN

An interview with Patricia Mullen Reilly, CRNA, BSN, staff nurse anesthetist, West Chester Anesthesia Associates, West Chester, Pennsylvania

Keilly has seen a lot since becoming a certified registered nurse anesthetist (CRNA) in 1977. In her 40-year tenure, she's witnessed an evolution in healthcare and changes in the patient population that compounds pressure injury (PI) risk.

"More people are having surgery than in the past, and the procedures have gotten longer and more complex," Reilly says. "There's also a rise in comorbidities today it's not uncommon to perform spine surgery on a morbidly obese patient. You didn't see that 20 years ago. In addition, more elderly patients are having surgery. If you add all that together, it puts more patients at risk than ever before."

Common risks that need to be assessed and con-

## Top tips to prevent Pls in the perioperative setting

- Before the patient arrives in the operating room (OR), as well as during the preoperative huddle and the timeout, discuss padding, support surfaces, and positioning in relation to the individual patient and the surgery.
- Perform a complete skin assessment when a patient arrives in the OR.
- Ensure that all surgical team members frequently assess and check for appropriate positioning, padding, and support surfaces during the procedure.
- Perform another complete skin assessment when a patient arrives in the postoperative (post-op) unit. The OR nurse should communicate positioning, length of surgery, and any concerns or potential pressure areas to the post-op nurse.

sidered in surgical patients include:

- obesity and diabetes, which decrease skin perfusion
- diabetic neuropathy, which may prevent patients from feeling discomfort when skin begins to breakdown
- procedures lasting 3 hours or more. (Reilly considers all patients having long procedures high risk for PL)

#### The cornerstone of preventive care

Over the decades, Reilly has worked with a variety of patients, surgical teams, and surgical facilities that may—or may not—have had PI-prevention protocols. Despite this, she's never had a PI develop, to the best of her knowledge, on any of her patents.

Reilly says that even without protocols, nurses and CRNAs can effectively assess, advocate, and intervene to prevent Pls. She believes that nurses are the cornerstone of preventive care and can drive performance improvement throughout the surgical team.

"Pressure injury prevention works the best if the whole team is involved and everyone takes ownership, including physicians, anesthesia providers, perioperative nurses, and surgical technicians," Reilly says. "Everyone constantly has to ensure the patient is positioned appropriately, especially unconscious patients."

#### Taking time to prevent PI

Today, Reilly works for an anesthesia group that provides services to a community hospital and a surgery center. Her cases are varied and include abdominal; ear, nose, and throat; dental; orthopedic; diagnostic; spine; and robotic procedures. Her patients include infants and children, the elderly, and every age group in between.

Each case is unique. This can make it challenging to ensure access to the surgical site, I.V. lines, and monitoring equipment while protecting patients from PIs. One of Reilly's roles as a CRNA is to make sure that the whole team is vigilant about PI prevention. "A lot of eyes are looking at every part and constantly checking and rechecking," she says.

#### Padding and positioning

Reilly says the best way to minimize the risk of PIs is to ensure patients are padded and positioned appropriately *before* the procedure. "Today, so much emphasis is placed on efficiency, but we need to keep our focus and take time to ensure proper padding and positioning," she says.

To protect areas that are vulnerable to PIs, Reilly makes use of many padding and positioning options, including:

- gel and foam pads that can be adapted to the area that needs protection
- pillows and blanket rolls
- padded headrests.

For example, during head-and-neck procedures, Reilly uses a disposable positioning pillow that keeps pressure off the ears, a high-risk area. She also uses face pillows, which keep the face free and clear of pressure and ensure the eyes, nose, and mouth remain visible to the staff.

Patients who must be in the prone position are especially at risk for PIs to the abdomen, breasts, knees, toes, and genitals. In this case, use positioning devices to elevate and reduce pressure on these areas. Another option is a support surface, such as an overlay, that can reduce the risk of PIs during long procedures.

#### Danger from medical devices

Common medical and surgical devices, if not used correctly, also can cause PIs. For example, taping a pulse oximeter to keep it in place can put too much pressure on the fingertip and result in injury. Instead, the device should be applied using only the pressure of the device itself.

"We must know how to use products appropriately," says Reilly, who adds that even a blood pressure cuff can cause problems in some cases. "If a patient's skin is fragile, I'll put gauze padding under a blood pressure cuff."

Endotracheal (ET) tubes and tube holders also have the potential to cause Pls. In her practice, Reilly uses tape, not ET tube holders. She says she hasn't seen any Pls related to ET tubes because she remains alert to potential issues throughout procedures. Also, because she's positioned at the head of the patient, she can see and readjust the tape and tube as needed to reduce pressure.

Other common surgical and medical devices that can cause PIs if they're not monitored or if they're used improperly include:

- sutures
- tracheostomy ties
- oxygen cannulas and masks.

The National Pressure Ulcer Advisory Panel recommends these important elements for the safe use of medical devices:

• Use the proper size device for the patient.

#### Injuries are more than skin deep

Meticulous attention to positioning in the operating room is important to prevent many complications that can go hand-in-hand with PIs, including:

- nerve injuri
- musculoskeletal injuries
- circulatory compromise
- reduced respiration.

Causes can include

- incorrect positioning in stirrups during gynecological procedures
- unpadded shoulder braces
- constricting patient gown, especially at the neck
- incorrect use of traction devices.

"To lower the risk of nerve injuries, I let patients with lower back problems position themselves while they're still awake," Reilly says. "They can tell you if the positioning isn't good for them. It's not possible to do this with all patients, but if you can, you should."

- Pad and cushion the device as needed.
- Remove or move devices to check the skin daily.
- Avoid placing devices over previous PI sites.
- Watch for edema, as well as redness and other signs of skin breakdown.
- Ensure that patients aren't lying on devices, such as I.V. tubing.

#### A culture of prevention

Reilly stresses that operating room staff must feel empowered to intervene when a patient is at risk. Even with a good PI-prevention protocol, the culture in surgery must support staff to speak up—even on a busy day.

"It's key to be observant and act as a team because preventing pressure injuries will probably become more challenging as surgery and patient populations continue to evolve," she says.

Catherine Spader is a medical and healthcare writer and editor in Littleton, Colorado.

#### RESOURCES

National Pressure Ulcer Advisory Panel. Best Practices for Prevention of Medical Device-related Pressure Injuries.

npuap.org/wp-content/uploads/2013/04/Updated-MDPI-Poster2017.pdf

Association of Perioperative Registered Nurses. Prevention of perioperative pressure injury aorn.org/guidelines/clinical-resources/tool-kits/ prevention-of-perioperative-pressure-injury-tool-kit

www

# Preventing Pls across the acute-care continuum

Nurses in acute-care settings form a frontline of defense against pressure injuries (PIs). Here are selected strategies, based on the information in this special report. Note: Always document your assessments and prevention strategies in the patient's health record, and always provide a complete report (including prevention strategies implemented and any PI concerns) when you transfer the patient to another provider.

#### **Medical-surgical**

- Conduct a risk assessment, using a scale appropriate for the patient, such as the Braden Scale for Predicting Pressure Sore Risk for adults.
- If a patient can't be moved, consider an alternatingpressure support surface with low air-loss and microclimate control.
- Use a support surface when the patient is sitting in a chair. If possible, have the patient stand and march for about five steps every hour.
- Establish a turning schedule based on patient needs.
- Pay particular attention to the heels, which are commonly at risk for PIs; be sure they're elevated.
- In cases of malnourishment, consider a support surface that the patient can immerse into and obtain a nutritional consult.
- Remove any urine, sweat, or stool quickly and moisturize the skin with topical skin products.
- Be creative in providing staff education, such as online modules and posters.

#### **Critical care**

- Conduct a risk assessment using a scale appropriate for the patient.
- Use a risk stratification tool appropriate for critically ill patients, such as the one on page 14.
- Be mindful of skin changes at life's end (SCALE).
- Use a bundle, such as SKIN:
  - Surface (includes surfaces such as overlays with alternation nodal support, tissue relief, and low airloss to control microclimate; remember to provide support surfaces for chairs as well)
  - Keep turning (includes reducing immobility, considering mini-turns [weight shifting at least every 30 minutes] for appropriate patients)
  - Incontinence (includes using moisture barriers and avoiding indwelling catheters and diapers)
  - **N**utrition (includes assessing for nutritional deficits and providing adequate protein for positive nitrogen balance).
- Avoid skin pressure when securing medical devices (also important in other acute-care areas).

#### Perioperative

- Complete a preoperative assessment for PI risk. Two possible tools are the Munro Scale and Scott Triggers Tool.
- Use pressure-reducing surfaces such as polyurethane and polyether mattresses and alternating-pressure mattresses and overlays based on type of procedure, length of surgery, and patient comorbidities.
- Work collaboratively to ensure proper positioning to reduce PI risk, including a final check before surgery.
- Follow positioning guidelines from the Association of periOperative Registered Nurses.
- Ensure that all surgical team members frequently assess and check for appropriate positioning, padding, and support surfaces during the procedure.
- Check the skin immediately after surgery; share positioning, length of surgery, and any concerns or potential pressure areas with the nurse receiving the patient.

#### **Emergency department**

- Conduct a skin assessment for PI at least once per shift; include full-body skin assessment, as well as assessment of sensation, mobility, and nutrition.
- Keep skin clean and dry.
- Provide support surfaces such as overlays for patients who will be staying in the ED for an extended period.
- Reposition at least every 2 hours; every 30 minutes if the patient is immobile. Avoid 90-degree positions.
- When transferring patients, use shear-decreasing devices and size-appropriate equipment to facilitate ease of turning.
- Provide meals or snacks for patients waiting for a bed to open up.

# Collaborative interdisciplinary teams and pressure injury prevention

High-acuity patient skin care requires consistent communication between perioperative and critical-care staff.

By Angie Bergstrom, BSN, RN; Peggy O'Harra, BSN, RN, CCRN-CSC; Wanda M. Foster, MSN, RN, CCRN

Ollaboration is essential to pressure injury (PI) prevention in high-risk patient populations. Healthcare teams frequently work in silos, so making a concerted effort to communicate patient care goals and PI prevention measures across units and clinical roles is essential.

#### **Opportunities**

Our large academic medical center identified opportunities to improve communication of PI prevention processes for our high-acuity, critical-care surgical patients.

#### **Consistent PI prevention**

All units in which care is delivered to critically ill patients must follow the same pressure injury (PI) prevention strategies. From the emergency department to the cardiac catheterization lab and the cardiac intensive care unit, communication about a patient's skin integrity should be shared, and consistent assessment and monitoring performed. One way to do that is with a nurse navigator who shares individual patient skin-protection strategies and ensures that appropriate support surfaces and prevention devices are used. Advanced communication also helps ensure that products such as mattress overlays are available when the patient arrives at the destination unit, so that prevention strategies aren't interrupted by a transfer.

#### Checklist for successful collaboration

Most people want to collaborate, but not all collaborations are successful. Here's how you and those you work with can boost the likelihood of a successful project.

- Include relevant stakeholders. If you're unsure whether someone should be included, it's usually best to invite the person, who can always decline.
- 🖌 At the first meeting, be sure everyone knows the objectives.
- Set expectations for interactions up front, for example, treat others with respect and engage in open, nonjudgmental communication.
- 🖌 Decide who will be responsible for which parts of the project.
- Stick to the task at hand. Don't get sidetracked by issues not directly related to the project.
- Be willing to consult with others. For example, the team may discover that they need to consult with the supply chain coordinator to obtain more information about a product.
- 🖌 Establish goals with timelines
- 🏏 Assign tasks—with deadlines—to specific people.
- Keep notes of discussions and share them with the team.
- 🖌 Follow up to ensure goals are met.
- Communicate, communicate, and then communicate some more. You probably can't overcommunicate.
- Celebrate the team's successes. Don't wait for the end of the project to feel good about what's been accomplished.

Critically ill patients who undergo long surgical procedures often require cardiovascular-stabilization I.V. medications, such as vasopressin and norepinephrine. These medications can cause vasoconstriction and compromise the circulation to the blood vessels supplying oxygenation to the skin, increasing PI risk. Special positioning with appropriate padding and support surfaces during surgery is needed to reduce the risk. To help ensure proper positioning and use of other preventive measures during surgery and when the patient returns to the critical-care unit, we instituted a collaborative approach between the critical care and perioperative teams.

This direct communication is necessary to meet individual patient challenges and needs. For example, impaired skin integrity may not be immediately evident after surgery. Head-to-toe assessment and monitoring by critical-care nurses, which is partly based on understanding the care patients received in the operating room (OR), can reveal early stages of injury so that immediate intervention can be implemented. Critical-care nurses also consult with wound care specialists as needed.

#### Meeting the challenge

Initiating a collaborative approach presented workflow challenges. How would we incorporate daily collaboration meetings? Would placement of support surfaces interfere with workflow? Other challenges included identifying patient populations and using appropriate support surfaces. For example, incorporation of an alternating-pressure mattress required communication between the nurse managers and leadership, and among all of the critical-care units and the perioperative team. In addition, we had to coordinate support surface training for all team members. Nursing leaders in the critical-care units and the perioperative area met to coordinate the education and training, and the process for adding this PI prevention measure.

Now the critical-care charge nurse communicates bed surface preparation to the OR nurse during report. The OR nurse then communicates the information to the team technician assigned to pick up the bed for the patient. These communication steps, which are all accomplished by phone, haven't created any significant delays.

#### **Deliberate effort**

Meeting a goal of zero PIs requires a focus on communication, collaboration, clinical team engagement, and appropriate support surface use. Collaboration can be the most useful tool in your PI prevention arsenal for patients. (See *Checklist for successful collaboration.*) The strategy isn't complicated, but it requires daily deliberate effort by both critical-care and perioperative team members.

The authors work at Greenville Memorial Medical Center, Greenville Health System in Greenville, South Carolina. Angie Bergstrom is nurse manager in the cardiovascular ICU (CVICU) and cardiac ICU. Peggy O'Harra is a clinical nurse educator in the CVICU and the neuro and trauma ICU. Wanda M. Foster is the director of nursing, critical care division.

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# Collaboration improves pressure injury prevention

## Communication and research reduce OR-related pressure

By Catherine Spader, RN

An interview with Debra L. Fawcett, PhD, RN, director of infection prevention, Eskenazi Health, Indianapolis, Indiana. She has served as a panel member for the National Pressure Ulcer Advisory Panel.

Sometimes the most important discoveries are the result of a casual conversation over a cup of coffee.

In 1995, Debra L. Fawcett, PhD, RN, was a part-time operating room (OR) nurse who noticed something wrong when some of her patients left the OR. She saw a lot of skin redness on patients who'd had surgeries requiring lateral positioning. She knew something wasn't right, so she invited one of the intensive care unit (ICU) nurses to lunch. During their chat, she discovered that some surgical patients were developing unusual postoperative pressure injuries (PIs).

Fawcett was intrigued and started looking for more information, but at the time not much research about

## RCA: Getting to the root of the problem

Root cause analysis (RCA) is a structured process that can be used to investigate and analyze pressure injuries (PIs). It focuses on unearthing underlying problems in the continuum of care that increase the likelihood of PIs.

RCA includes data collection and reconstruction of the development of the PI by evaluating the electronic health record and conducting staff interviews. A multidisciplinary team then analyzes the information to determine how and why the PI occurred, with the goal of preventing similar injuries in the future.

You can use the pressure ulcer RCA template from the National Pressure Ulcer Advisory Panel to develop your own RCA (npuap.org/resources/educational-andclinical-resources/pressure-ulcer-root-cause-analysisrca-template/).



surgery-related PIs existed. This eventually led to her 2004 dissertation research about PIs that start in the OR. Fawcett found that it was a new concept for many who thought PIs were generally related to longer stays in hospital units and other facilities, such as long-term care.

"For years, pressure injuries were attributed to the unit where they were first seen," Fawcett says. "In reality, they may not have started there at all. Often, when a patient leaves the OR, the pressure injury isn't visible or may be mistaken as a burn. It may take as long as 24 to 72 hours for a surgery-related pressure injury to develop after leaving the OR."

#### **Education raises awareness**

To raise awareness about OR-related PIs, Fawcett developed a 3-hour citywide education plan as a member of the perioperative group of the Indianapolis Coalition for Patient Safety (ICPS). In March 2017, about 100 people from five large city hospitals, plus their satellite facilities, attended the program. Many were perioperative staff

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and wound, ostomy, and continence nurses. In addition, the ICPS perioperative group put together a presentation for the coalition's executive group, which was well received. "After the class, many participants told me they had no idea that pressure injuries were starting in the OR," she says.

Led by Fawcett, the group also completed a citywide survey about OR-related PIs. The purpose was to identify if perioperative staff were aware that PIs can begin in the OR, and if they were, what they should do about it. The survey found that many staff weren't aware and that lack of communication between units was a big factor.

Because communication was identified as a major issue, the clinical nurse specialists at Eskenazi Health started tracking their cases, specifically looking for the OR connection and performing root cause analysis (RCA) to determine where a PI occurred and the cause. "Now that we're doing RCA, we are indeed finding that some pressure injuries may be coming from the OR," Fawcett says.

RCA results are shared with the surgical team members. Fawcett advocates that all teams perform RCA on every injury and share the findings with all departments.

#### ED to OR: The perfect storm

Current research has found that PIs also may start in the emergency department (ED). "Hospitals must sometimes hold patients in the ED for 12 hours or more on narrow carts that aren't designed to redistribute pressure or for easy repositioning of patients," Fawcett says.

A study published in 2017 concluded that PIs are a common complication of even a short stay in the ED. Another study published in 2014 also found that short stays in the ED can produce PIs, especially stage 1 injuries.

Fawcett says that patients who go from the ED cart, to an OR table, and then to postanesthesia care before being admitted to a unit are at especially high risk for PIs. They've usually been supine for long periods.

Communication between departments is key to preventing PIs along the continuum of acute care. "Positioning and length-of-stay need to be a part of every report between nurses when transferring patients from one department to another," Fawcett says.

#### Engaging staff in research

To facilitate communication between departments, staff and department managers must put PIs high on their radar, Fawcett says. She's also found that nurses who are engaged in research are more engaged in PI prevention.

When it was time to replace OR mattresses at Eskenazi Health, the OR team pitched the idea of using overlays, which they thought might be less expensive and better for PI prevention than mattress replacement. Fawcett proposed a study to examine if there's a difference between their standard OR mattresses and mattresses with an overlay.

Forty staff members volunteered to participate in the

#### **RESOURCES for preventing** perioperative pressure injuries

### Association of PeriOperative Registered Nurses (AORN) webinar:

Best practices to improve communication among caregivers related to the prevention of perioperative pressure ulcers

https://goo.gl/qYc21J

#### AORN toolkit:

Prevention of perioperative pressure injury https://goo.gl/nkZcYm

study. The volunteers lay on the beds, with and without the overlay. Pressure was measured using interface pressure mapping, which reads the pressure between the patient and the surface and provides an image of the high-pressure areas. The mapping provides quantifiable numbers for pressure measurement.

"The results were that our mattresses had very good redistribution without the overlay, but with the overlay, we saw a dramatic increase in the pressure redistribution abilities of the surface," Fawcett says.

#### Nurses make a difference

Fawcett found that having staff nurses participate in research leads to more positive change than the PI education she offered. "The nurses could see and feel the difference in surfaces themselves, and it gave them the opportunity to ask questions," she says. "They felt like they were invested in change and a part of it, and they are now more aware of pressure injury. Our leadership encouraged the staff to participate, and that goes a long way."

Since the study, Fawcett is getting more calls from nurses asking how they can minimize PIs. For example, one OR nurse called her about a patient who needed to be positioned face down for spinal surgery. "She asked if there was something in particular they could do to prevent pressure injury," Fawcett says. "It's wonderful."

Fawcett is happy with the positive changes she's seeing within units along the continuum of care. The biggest gains are in awareness, education, and communication. "We are getting there, and making an impact," she says

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## Product evaluations: Collaborating with value analysis committees

# Value analysis committees help control costs while ensuring quality care.

By Armi Earlam, DNP, MPA, BSN, RN, CWOCN; Lisa Woods, MSN, RN-BC, CWOCN; and Sharon E. Spuhler

Il healthcare organizations strive to provide quality care and control costs. Because supplies account for the second largest expenditure after labor, healthcare products must be carefully evaluated using value analysis. This systematic, evidence-based process of measuring relevant data and weighing multiple factors when considering a product purchase is patient-centered, customer-focused, collaborative, and datadriven. It's led by supply chain value analysis committees (VACs). You need to understand how these committees function so you can work with them in implementing products that will help in preventing pressure injuries (PIs).

#### **Power in numbers**

Nurses and nurse managers are key members of VACs; other participants include physicians, financial leaders (such as the chief financial officer), supply chain management, information systems staff, and other clinicians (such as respiratory therapists and pharmacists). In larger organizations, system analysts and category managers may serve on the committee.

In addition to forming hospital systems that take advantage of the benefits of VACs, healthcare organizations can join a group purchasing organization (GPO). GPOs help hospitals, agencies, and other organizations aggregate purchasing volume and use that leverage to negotiate discounts with manufacturers, distributors, and other vendors. As a clinician, you may think that "bean counters" are running the organization but instead think of it as power in numbers—power that provides several benefits.

#### **VAC benefits**

VACs offer three main benefits: vendor relationships, fiscal stewardship, and return on investment (ROI).

#### Vendor relationships

By building relationships and working hand in hand with vendors, VACs ensure hospitals stay

on the cutting edge of new technology and product advancement while also optimizing savings. They use a concept similar to bulk buying to control costs, much like how individual households buy from warehouse retail clubs (think of the big box of 13 dental floss packets you buy). System analysts use software and databases to get the best possible price for each product and to keep vendors competitive with others in the same market.



#### **Fiscal stewardship**

A VAC's focus on fiscal stewardship ensures that clinical efficacy and cost are considered with each purchase. When nursing staff partner with the committee, new products can be brought in quickly to trial at a location. When the trial is completed in one unit or facility, the product can be implemented in other facilities within the organization. This saves time and resources, allowing for more trials and more products brought in without the lag time of conducting multiple trials.

#### ROI

To ensure a good ROI, VACs will consider whether all the "bells and whistles" of a product are really necessary within your practice setting. For example, an interactive, talking hospital bed may be

#### Value analysis steps

How are new or alternative products introduced to an organization? These are the most common steps in value analysis:

- Identify a product need or explore alternatives to products already in use.
- 2 Gather data about why the product is needed and other important information about the product. Ideally, you want to consider randomized controlled trials and nonbiased studies (not sponsored by manufacturers).
- Conduct preliminary negotiations. (Negotiations usually are handled by the materials management department of the hospital or hospital system.)
- 4 Perform a clinical trial or receive approval.
- Conduct final negotiations.
- Implement the use of the product and provide staff education as needed. In addition, the product will be loaded into the inventory and billing systems.
- Perform an audit to evaluate product use and efficacy.

intriguing, but if your patient population is mostly sedated and intubated, this added feature may not be worth the investment. On the other hand, if a mattress overlay reduces costs associated with PIs, the initial price tag will be well worth it.

#### **Quality assurance and compliance**

VACs don't just look at price tags; they make sure products help deliver safe, quality care. M.D. Anderson listed the following roles of VACs:

- establish and maintain supply formularies
- initiate and direct product evaluations
- advise on policy formulation related to product evaluation, selection, and use
- coordinate education (determine training needs and coordinate with department heads and other stakeholders; communicate with staff and departments regarding product changes or evaluation initiatives).

In addition, VACs usually collaborate with clinicians about contract compliance. For example, when an organization opts to use Company Z's foam dressing, the company may require a 75% utilization rate. This means that the bulk of the foam dressing used should come from Company Z; the remaining 25% can be from other companies. Compliance is important because contracts may stipulate that if a certain condition is met, the healthcare organization may receive financial incentives, such as rebates.

#### VACs at work

To illustrate the VAC process, let's say you're us-

ing a repositioning system that has the turning sheet, liner, and two wedges to help offload the sacral area, reposition the patient side-to-side for pressure redistribution, and prevent the patient from sliding down in the bed. This four-piece system costs \$150 per unit, but you've identified a similar product that's only \$125 per unit. After you discuss the new product with the VAC, your organization decides to bring the product in for testing.

The next steps in the process involve measuring cost savings and patient outcomes of the product test. Did you achieve your goal of preventing PIs through repositioning and offloading? Were your costs contained? Let's say your PI rate was similar to using the original product; however, you observed that the sheets and liners easily tear, and your staff keeps replacing them. In this case, you're not only spending more on products but also on labor costs. In this scenario, even if the second product is more affordable per unit cost, your organization will come out ahead by keeping the original product.

As a clinician, you may think that "bean counters" are running the organization but instead think of it as power in numbers—power that provides several benefits.

When bringing in a new or alternate product, you may find that just submitting the paperwork is onerous. Some organizations require pages of completed documents before you can even talk about the new product with the VAC. However, most forms ask the following questions:

- Is the product new?
- What does the product cost and what's its projected usage?
- How will the product improve the quality of care and decrease costs?
- Is a similar product already in use in your facility?
- What other instruments or equipment must be used in conjunction with the product?
- Does the product require special training or certification?

(continued on page 40)

# Framing a strategy for eliminating pressure injuries

### A CNO perspective

By Nancy M. Valentine, PhD, MPH, RN, FAAN, FNAP

"ven Superman couldn't win battle with pressure ulcers," blared the headline of a 2006 *Science Daily* article, which reported that "the late actor Christopher Reeve, best known as 'Superman', spoke openly about his struggle with pressure ulcers after being paralyzed...He died at the age of 52 from complications reportedly associated with an infected pressure ulcer." Published more than a decade ago, the article drives home the point that we had little scientific evidence on how to prevent pressure injuries (PIs).

We certainly know more now. We've organized specific approaches to care, or "bundles" of best practices. We attempt to foster interdisciplinary teams, and the government has imposed financial penalties for hospital-acquired PIs. Have these efforts made a difference? Sadly, not enough.

#### Pls and quality of life

PIs extend beyond the hospital stay. While dining out recently, I noticed an elderly gentleman struggling to his feet after his meal, grasping for his crutches while other family members helped him stabilize in preparation for the long walk to the door. He grimaced, moving forward with halting steps. When asked, a member of the family huddle said that her father had recently had a successful hip operation, but a "sore on his foot" from the hospital was not healing, making it difficult for him to walk.

This is what failure looks like after people in our care leave the hospital injured. The operation was a success, but the patient still can't walk normally. Despite the cost of his surgery and hospitalization, his quality of life hasn't improved. My mind moved from the individual's discomfort to the burden of care this places on everyone in his orbit. The effects are far reaching, and statistics don't include everyone. For a snapshot of the extent of PIs in the United States, see the infographic on page 7.

#### Leadership's responsibility

In the complex world of healthcare, we can

lose sight of how to prioritize all of the competing goals. At the unit level, the daily drill of "must dos" clamor for attention. Even the best-intentioned staff and nurse managers who can "see the forest for the trees" get lost in daily demands.

All of our nurse-sensitive measures are important, but preventing skin injuries should be at the top of the list. Why? Because for many patients, preventing PIs can be the difference between a full recovery versus a marginalized life. As a profession, we must take action to raise the standard of care.

Would we tolerate such potentially life-threatening failure in other areas of our lives? For example, the airline industry doesn't point to

grumpy passengers, competing prices, gas shortages, weather conditions, and cancelled flights as a justification for frequent crashes. The response would be public outrage and government investigations, fines, and loss of business.

Healthcare is a business outlier in terms of consequences for errors. Although our mistakes typically are more covert, we must have the same sense of urgency and "customer focus" for developing a standardized approach to patient safety. Why isn't this the healthcare industry standard? As healthcare leaders, we're obligated to make a difference to those in our care. And all nurses must take the lead for change. The following steps can help us reach our goal of PI prevention.

#### Address the realities

Despite the availability of well-evidenced guidance and good intentions, David Naylor of The King's Fund (an independent organization that works to improve health and care in England) notes that an "implementation gap" still exists between what we want to do to keep patients safe and what actually



happens in practice. Every healthcare organization can analyze the gaps in its care processes and develop remediation plans, but you'll need a commitment to excellence and unrelenting focus.

### Use a conceptual framework and work the plan for care transformation

Nursing leadership is key to organizing prevention plans for all nurse-sensitive quality measures. According to Oster and Deakins, application of high-reliability principles in daily healthcare processes can drive culture change, safety, and quality outcomes. They've demonstrated how using a conceptual model composed of five principles (sensitivity to operations, preoccupation with failure, deference to expertise, reluctance to simplify, and commitment to resilience) can strengthen the full utilization of evidence-based practice, reduce clinical variation, and improve nurse-sensitive patient outcomes.

This comprehensive plan of action provides the roadmap for instilling excellence in care. But the leadership's will to succeed must be the driving force that steers an organization's work. Constant hard work, including drilling and practice, will make the difference between failure and success. Because Oster and Deakins capture both quality measures and cost impact, they've been able to demonstrate the value of prevention and, by extension, the cost benefits of expert nursing care.

#### Learn from winners

Because PI prevention isn't a static process, the Health Research and Educational Trust has published a comprehensive, state-of-the-art change package on hospital-acquired PI prevention. It includes best practices, innovative approaches borrowed from high-performing U.S. health organizations, and an organized methodological approach for assessing innovations. This advanced tool set provides superb guidance and structure for changing processes.

#### Apply state-of-the-art tools

We sometimes forget that others are equally committed to finding solutions and take pride in making a difference. Industry partners can provide products and services that can be tapped to try new approaches.

In a marketplace with so many new products, product differentiation requires focused decisionmaking. All nurses—including front line staff, wound care specialists, managers, and clinical specialists from areas with high risks for skin breakdown—are key to the process of assessing and selecting new products. And including them in the process gives them a voice and encourages them to be personally invested in the outcomes. Broad clinical input is invaluable to ensuring a good return on investment of any new product.

Note this advice from those with experience on product selection committees:

- Nurses must be at the table.
- Cheaper isn't always better.
- Simplicity in design is critical.
- Products must be evidence-based to achieve results.
- When possible, include consumers, families, and homecare teams in the process.

Clinicians and leaders also need to collaborate with staff in finance, who can help with determining return on investment. For example, data on the number of PIs (including treatment costs) and the effectiveness of a piece of equipment on reducing PIs can be used to make a business case for purchasing the equipment.

#### At the crossroads

We're at the crossroads of making quality outcomes the standard of care across the healthcare system. Leadership is key to this transformation and nurses are pivotal to its outcomes. Only when we work in teams and harness knowledge with the passion to excel will we make the difference and save those in our care from disability and possible death resulting from hospitalization.

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# Navigating the maze of support surfaces

# Learn how support surfaces work to help prevent pressure injuries.

By Deborah Sidor, MSN, MSNA, NP, ACNS-BC, CCRN, and Mary Sieggreen, MSN, CNS, NP, CVN

Support surfaces are valuable tools for reducing pressure injury (PI) development and progression, but choosing the right one can be challenging. Nurses can make a difference in a patient's care by learning how support surfaces such as mattress overlays, mattress replacements, and specialty beds—redistribute or reduce tissue pressure and prevent PIs from developing or worsening. To understand how support surfaces help, you also need to understand how surfaces might contribute to PIs.

#### **Fearsome forces**

Factors that contribute to PIs include pressure, shear, and microclimate. (See *Support surface terms*.)

#### Pressure

A PI develops when external pressure against the skin exceeds capillary pressure for an extended length of time, resulting in tissue ischemia. It occurs when soft tissue is compressed between a bony prominence and a surface, such as a bed or chair.

#### Shear

Shear refers to pulling or stretching one part of the body while an adjacent part is pulled or stretched in the opposite direction, damaging both superficial and deep tissues. Shear reduces the tissue's ability to withstand pressure to less than half of its ability without the shear force. In clinical situations, shear occurs when the head of the bed is elevated more than 30 degrees and the patient slides toward the foot of the bed. The patient's skin adheres to the bed linen, while the bony skeleton slides downward, resulting in pulling and stretching of blood vessels and underlying tissue distortion.

#### Microclimate

Microclimate between the patient's skin and the



support surface includes temperature, humidity, and airflow. Normally, the skin releases heat and moisture into the air, allowing the body to cool itself. Because the outward flow of heat and moisture is inhibited when a patient is on a mattress, both increase at the interface between the skin and mattress. As the temperature rises, the metabolic needs of the skin rise. Moisture build-up weakens the skin and makes it more prone to damage.

For support surfaces to successfully contribute to PI prevention, pressure, shear, and microclimate need to be managed.

#### **Support options**

The National Pressure Ulcer Advisory Panel (NPUAP) says a support surface is "a specialized device for pressure redistribution designed for management of tissue loads, microclimate, and/or other therapeutic functions." The most important role of a support surface is redistribution of pressure on the tissue loads.

#### Support surface terms

Shear and friction are frequently confused. Shear occurs within the body planes (skeleton, muscle, or subcutaneous tissue), and friction occurs when something slides against the skin. Knowing the terms related to support surfaces will help you understand how they can aid in pressure injury prevention. For additional information visit bit.ly/2H7xZ7b.

Term	Definition
Friction	The resistance to motion in a parallel direc- tion relative to the common boundary of two surfaces.
Coefficient of friction	A measurement of the amount of friction existing between two surfaces.
Envelopment	The ability of a support surface to conform, so that it fits or molds around body irregularities.
Fatigue	The reduced capacity of a surface or its com- ponents to perform as specified. Fatigue may be the result of intended or unintended use and/or prolonged exposure to chemical, ther- mal, or physical forces.
Force	A push-pull vector with magnitude (quantity and direction of pressure and shear) that's ca- pable of maintaining or altering the body's position.
Immersion	Depth of penetration (sinking) into a support surface.
Life expectancy	The defined period of time during which a product can effectively fulfill its designated purpose.
Mechanical load	Force distribution acting on a surface.
	The force per unit area exerted perpendicular to the plane of interest.
Pressure redistribution	The ability of a support surface to distribute load over the contact areas of the human body. (This term replaces previous "pressure reduction" and "pressure relief surfaces.")
Pressure reduction	This term is no longer used to describe classes of support surfaces. The term is pres- sure redistribution; see above.
	This term is no longer used to describe class- es of support surfaces. The term is pressure redistribution; see above.
Shear	The force per unit area exerted parallel to the plane of interest.
Shear strain	Distortion or deformation of tissue as a result of shear stress.

Source: Used with permission of the National Pressure Ulcer Advisory Panel, 2007.

Components of support surfaces include air, gel, fluid, and foam. Support surface categories include reactive, active, integrated bed systems, nonpowered, powered, overlays, and mattresses. (See *Support surface categories.*)

Therapeutic support surfaces redistribute tissue loads through immersion (depth of the patient's body pressing into the support surface) and envelopment (ability of the surface to conform around the body). As the body surface area contacts the support surface, pressure redistribution occurs.

Foam is the most widely used support surface. Foam surfaces are available in a variety of densities, including basic elastic and viscoelastic. High specification foam is preferred for patients at any risk of injury. Density/hardness defines the foam grade; a high specification mattress has a density of 35 kg/m<sup>3</sup>, a hardness of 130 N (the higher the newton, the more force needed to compress the mattress, which means it's firmer than one with a lower newton), and a depth of at least 5.9 inches.

But foam isn't always the best choice, or it may not be the only intervention needed. Select support surfaces based on features that best fit the patient's needs. For example, studies have shown that beds or surfaces that are air fluidized, have low air loss, or are powered, are effective for patients at high risk for PI or who have existing injuries. The key is to find the right combination. For example, a powered mattress overlay can reduce skin shear while providing a microclimate that removes excessive heat and moisture.

#### **Choose wisely**

In 2014, NPUAP developed these general recommendations for support surface selection and monitoring:

- Select a support surface that meets individual patient needs.
- Choose a support surface compatible with the care setting.
- Examine the appropriateness and functionality of the surface on each encounter with the patient.
- Identify and prevent complications of support surface use.
- Verify the support surface is used within its functional lifespan.
- Reposition the patient regularly.
- Choose devices, incontinence pads, linen, and clothing compatible with the support surface.

Despite these recommendations, selecting a support surface can be challenging because of confusing terminology and standards. Fortunately, you have two excellent resources.

- NPUAP created the Support Surface Standards Initiative (S3I) to help develop uniform support surface terminology, test methods, and reporting standards (bit.ly/2vcA7WP).
- The Wound Ostomy Continence Society created an evidence- and consensus-based algorithm for support surface selection. Instructions for the algorithm are provided in a free education module (wocn.org/?page=SSA).

#### Monitoring and more

Your work isn't done after support surfaces are selected and placed. You must monitor the system to ensure it's working properly and assess patients vigilantly. A change in patient condition may require a change in support surface. Document patient assessments and support surfaces used in the patient's health record and communicate them during patient hand-offs.

#### A tailored approach

Tailor prevention and treatment interventions to individual patient needs and desires. When selecting an appropriate support surface, consider the patient's PI risk assessment results, level of immobility, need for microclimate control and shear reduction, and his or her size and weight. Also consider the number, severity, and location of existing PIs; the patient's comfort and preference; and surface availability and ease of use. No one surface is ideal for all patients, so use your analytical skills to ensure the optimal fit between the patient and the support surface.

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#### Support surface categories

You have options when it comes to support surfaces. When you understand how they work, you can choose the surface that's right for individual patients.

#### Support surface Definition

Reactive support surface	A powered or nonpowered support surface with the capability to change its load distri- bution properties only in response to applied load.
Active support surface	A powered support surface with the capability to change its load distribution properties with or without an applied load.
Integrated bed system	A bed frame and support surface that are combined into a single unit; the surface can't function separately.
Nonpowered	Any support surface that doesn't require or use external energy sources.
Powered	Any support surface that requires or uses ex- ternal sources of energy.
Overlay	An additional support surface that's placed directly on top of an existing surface.
Mattress	A support surface placed directly on an exist- ing bed frame.

Source: Used with permission of the National Pressure Ulcer Advisory Panel, 2007.

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# How to navigate support surface options



## Matching the right support surface to the patient is just as important as matching the right-sized I.V. catheter.

- Familiarize yourself with support surface terms (see p. 36) and categories (see p. 37).
- Understand the components of support surfaces, including air, gel, fluid, and foam.
- Consider which surface is best for managing:
  - pressure
  - shear
  - microclimate.
- Consider the care setting: critical care, emergency department, or other.
- Choose devices, incontinence pads, linen, and clothing that are compatible with the support surface.
- Use the evidence- and consensus-based algorithm for support surface selection developed by the Wound Ostomy Continence Society (algorithm.wocn.org/#home).





#### Your work isn't done after selecting a surface.

- Monitor the support surface's effectiveness frequently.
- Minimize the number and types of layers between the patient and the support surface.
- Remember that a change in the patient's condition may require a change in support surface.
- Document assessment and support surfaces used in the patient's health record and communicate the information during patient hand-offs.

\*For example, very young or very old age and hemodynamic instability.

#### (continued from page 9)

sensation, so share information on skin assessment, frequent turning, pressure release, and nutrition. In addition, patients with impaired mobility should be placed on a turning or pressurerelease schedule, and they shouldn't be positioned on any currently existing PIs.

#### Communication

Assessment and prevention, as well as any evidence of PI, should be documented in the electronic health record. Communicating potential and actual PIs and prevention steps taken by the nurse on the admitting unit helps to ensure continuity of care.

#### Be an advocate

PI prevention begins with risk recognition. Emergency nursing is fast-paced and dynamic; it epitomizes multidisciplinary patient care. For those reasons, we must advocate for PI assessment and prevention in and out of the ED. The earlier we identify risk factors, the earlier we can intervene to prevent injuries.

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#### *(continued from page 11)*

duces significant injury. Remove any urine, sweat, or stool quickly and moisturize the skin with topical skin products. Use products, such as dimethazone, zinc, and petrolatum, to prevent body fluids from damaging the skin with the next episode of incontinence.

Skin with a prior injury, especially an earlier PI that's healed with scar tissue, can't tolerate pressure. Scar tissue is much less elastic than native skin; when it's stretched it can open. The resulting injury may be a new, recurrent, or reopened injury, depending upon the time since the original injury and the degree of healing that's occurred.

#### **Prevention success**

PI is preventable in most patients. Accurate risk assessments and a plan of care that reduces the intensity and duration of pressure are key to prevention.

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#### (continued from page 16)

- Stress incontinence—Urine leakage when the bladder is under pressure (for example, when coughing or laughing).
- Urge incontinence—Urine leakage resulting from a sudden, intense urge to urinate.
- Overflow incontinence (chronic urinary retention)—An inability to fully empty the bladder, which causes frequent leaking.
- Total incontinence—The bladder can't store any urine, which leads to constant or frequent leaking.

#### 5. Nutrition

Malnutrition increases PI risk. Screen each patient's nutritional status at admission, with each significant change of clinical condition, and when PIs are slow to heal. Refer patients at risk of malnutrition and those with existing PIs to a registered dietitian or an interprofessional nutrition team.

Provide adequate protein for positive nitrogen balance for adults, which can include high-calorie, high-protein nutritional supplements in addition to their usual diet. Adequate daily fluid intake also is important. Monitor patients' hydration status, checking for signs and symptoms of dehydration,

#### (continued from page 32)

The forms also require disclosure of any conflict of interest, such as any financial ties you may have with the manufacturer.

You may think that your organization is making you jump through hoops. But really, they just want to ensure that you're cognizant of the costs, the effectiveness and safety of the product, and any possible ethical issues before the analysis begins. (See *Value analysis steps.*)

#### Containing costs, optimizing care

To ensure healthcare costs are contained and patient care is optimized, nurses and nurse managers must collaborate with other members of their organization—including other clinicians, VACs, and financial officers—when evaluating products. You must perform your due diligence. A systematic, collaborative, and data-driven value analysis process is the best place to start.

The authors work at Lutheran Medical Center (part of the Sisters of Charity of Leavenworth Hospital System SCLHS) in Wheat Ridge, Colorado. Armi Earlam is lead in the wound, ostomy and continence nurse department. Lisa Woods is a wound, ostomy and continence nurse. Sharon E. Spuhler is the supply chain distribution manager. such as changes in weight, skin turgor, urine output, elevated serum sodium, or calculated serum osmolality. In addition, continuously monitor renal function to ensure that high levels of protein are appropriate.

**CLINICAL ALERT** Care for patients at risk for PI based on their nutritional status should include individualized nutrition care plans; consider each patient's nutritional needs, feeding route, and care goals.

#### Zero tolerance

PI prevention is essential to patient safety. An evidence-based skin care bundle will ensure all appropriate steps—risk assessment, skin inspections, appropriate support surfaces, and skin protections—are taken to prevent and treat PIs. Some PIs may be unavoidable, but all organizations and healthcare professionals should take a zero-tolerance approach toward prevention.

For a complete list of selected references, visit americannurse today.com/?p=43466.

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# Perfusion is Prevention

Use of alternating pressure surfaces from Dabir® helps to reduce the incidence of pressure injuries.

Prolonged ischemia that can occur in immobilized patients may be a factor that increases risk for pressure injuries.<sup>1</sup>

Alternating pressure has been shown to increase skin blood flow in clinical studies.<sup>2</sup>

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## Perfusion is Prevention

You work hard to protect your patients' skin Our dedicated team of professional nurses at Dabir will work with you every step of the way to help you exceed your patient injury prevention goals.

We will partner with you to provide evidence-based strategies that support your research agenda, enable you on your Magnet® journey and equip you with advanced technology that helps to improve patient outcomes.

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