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Hospital-Acquired Pressure Injury Project

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NOTE: In April 2016, the National Pressure Ulcer Advisory Panel (NPUAP) published all-new naming and staging conventions. This paper uses the term pressure injury when reporting in the present and pressure ulcer whendiscussing the topic historically. To review the new conventions, please refer to "Pressure injury stages" at http://bit.ly/2aY9hV0

WHITE PAPER

ABSTRACT

Characteristics of pressure ulcer prevention protocols, variations in assessing and reporting hospital-acquired pressure injuries (HAPI), and the impact of collaborative practice models, including safe patient handling and mobility (SPHM) practices, on HAPI prevention are presented.

KEYWORDS

Pressure Ulcer, Pressure Injury, Protocols, Assessment, Reporting, Collaborative Practice

KEY POINTS

- **The problem of pressure injury is increasing**
- **Processes for prevention, assessment, and treatment are unchanged**
- **Widespread inconsistency exists in assessment and reporting**
- **Little attention is given to collaborative practice models**
- **A need exists for an all-new approach to an age-old problem**

INTRODUCTION

Pressure injury continues to pose an economic and humanistic challenge in the health care field (or) for health care providers, despite ongoing organizational and legislative efforts to control the problem. Although disincentives are in place to reduce the incidence of avoidable Stage 3 and 4 pressure injury, prevention protocols that have been in use for over three decades remain in practice today. Further, aspects of data collection and reporting to monitor the frequency and severity of pressure injury formation have come into question: For instance, how are Stage 3 and 4 pressure injuries differentiated from other types of full-thickness skin injuries? What is the level of inter-rater reliability in data collection? Is there consistency in data reporting? What accounts for variation in reporting? This project seeks to identify characteristics of pressure injury prevention protocols currently in use, describe variations in assessment and reporting of hospital-acquired pressure injuries (HAPI), and explore the impact that collaborative practice or other innovations may have on changing the way general and acute care facilities in the United States (US) manage the prevention and treatment of pressure injury.

BACKGROUND

WHAT IS THE NATURE OF THE PROBLEM?

Each year, more than 2.5 million people in the US reportedly develop pressure injuries.[1] In 2013, pressure injury resulted in 29,000 deaths worldwide, which is an increase from 14,000 deaths in 1990.[2] According to the Centers for Medicare and Medicaid Services, certain categories of pressure injury are considered one of eight preventable hospital-acquired conditions. Hospitals spend about $5 billion annually to treat pressure injury.[3] In acute-care settings in the US, the incidence of pressure injury is 0.4 percent to 38 percent; in long-term care, it is 2.2 percent to 23.9 percent, and in home care, it is 0 to 17 percent. Similarly, there is wide variation in pressure injury prevalence: 10 percent to 18 percent in acute care, 2.3 percent to 28 percent in long-term care, and 0 to 29 percent in home care. There is a much higher prevalence of pressure injury in intensive-care units, where 8 percent to 40 percent of patients develop pressure injury.[4]

COMPARING PREVALENCE AND INCIDENCE

In the acute-care setting, point prevalence is a term used to describe the number of patients with a pressure injury at a specific point in time. Incidence, on the other hand, refers to the number of patients who have acquired a pressure injury over a specific period of time, such as the course of their hospitalization. Because incidence captures only hospital-acquired pressure injury, this is the most direct measure of quality.

WHAT IS A PRESSURE INJURY?

Pressure injuries are often referred to as pressure ulcers, pressure sores, bedsores, or decubitus ulcers. A pressure injury is 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 painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, comorbidities, and condition of the soft tissue. On the average-size patient, the most common sites to develop pressure injuries are the sacrum, coccyx, buttocks, heels, ischium, trochanters, and elbows and beneath medical devices.[6] Other areas where pressure injuries develop include the ankles, head (occiput), ears, and any other area where there is prolonged contact between a surface, as an external force, and the patient's body.

CAUSATIVE AND CONTRIBUTING FACTORS

The primary cause of pressure injury is pressure. Pressure injury occurs because pressure applied to soft tissue results in complete or partial circulatory obstruction to that tissue. Shear is considered a causative factor, as shearing forces angulate blood vessels that nourish and hydrate the affected tissue. Contributing factors include protein-calorie malnutrition, threats to microclimate, and conditions that affect circulation or sensation. Healing delays are common among the elderly, those with multiple comorbidities, those who smoke, and those who use certain steroidal or other medications.[7,8]

WHAT CONSTITUTES A HAPU/HAPI PROGRAM?

Hospital-acquired pressure ulcer (HAPU) prevention and treatment programs have been in place for at least three decades in acute-care facilities.[9] These risk management programs have typically comprised four components: risk-based prevention, local and systemic intervention, education, and outcomes measurement and reporting.[10]

The earliest documentation of pressure ulcer prevention and treatment as practiced today was reported in 1985.[11] Prior to that time, the literature was largely void of pressure injury information as it exists today. Advanced technology, access, and consumer demand have collectively extended longevity, thus leading to a subset of patients who are at greater risk for pressure injury development. To that end, prevention has become a significant component of a HAPU/HAPI program.

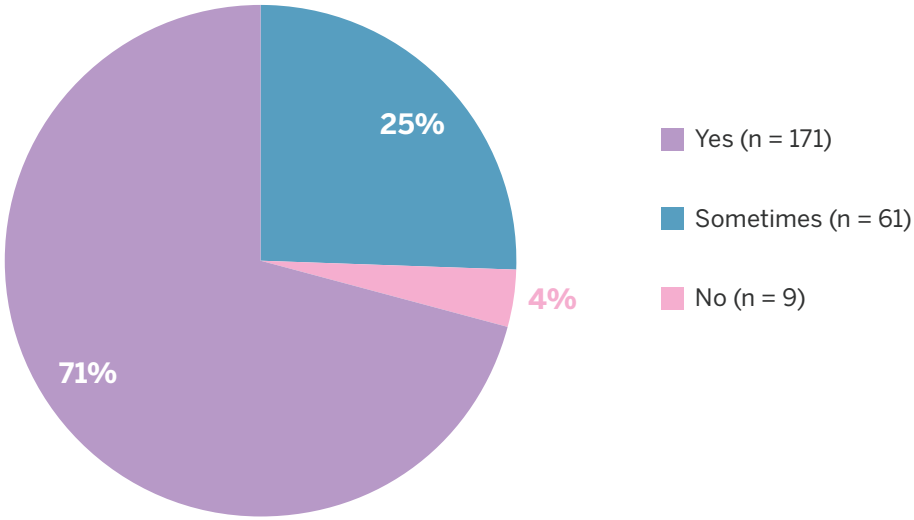
PREVENTION

Prevention is a cost-effective alternative to treatment, and tools are in place to promote preventive activities. Pressure injury risk assessment tools have been available for at least the past four decades. Each of the more commonly used assessment tools addresses a different region in the world, target population, or practice setting.[12] From a historical and global perspective, a number of studies and reviews have compared a variety of assessment tools.[13,14] The Norton Scale for Assessing Risk of Pressure Ulcers (Norton Scale), the Waterlow Pressure Ulcer Risk Assessment/Prevention Policy Tool (Waterlow), and the Braden Scale for Predicting Pressure Sore Risk (Braden Scale) are the more frequently discussed and studied tools.[15] The Waterlow is the most frequently used system in the United Kingdom (UK). Although not used in the US, the Waterlow is designed for use in acute care as well as in a community setting, and therefore it has become popular in certain parts of the world.

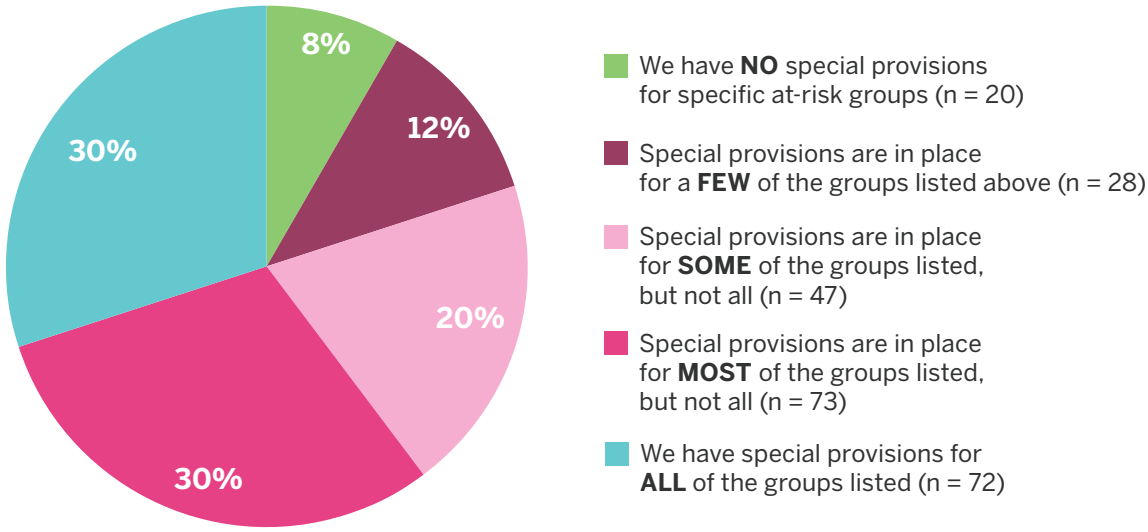
The Norton Scale is a tool designed in 1962 in the UK by Doreen Norton. It is currently used in certain facilities in the US to estimate a patient's risk for developing pressure injury. The patient is rated from one to four on five different parameters, with a score of 14 or more indicating high risk for pressure injury development. The Norton Scale was the first pressure injury risk evaluation scale to be created. [16, 17, 18]

The Braden Scale was developed in 1987 by Barbara Braden and Nancy Bergstrom to help health care professionals, especially nurses, assess a patient's risk of developing pressure injuries. The Braden Scale is the most common and most widely used pressure injury risk assessment tool in the US and while it can be applied to all clinical areas, it is the primary assessment tool in general and acute care settings. The goal of the Braden Scale is to provide a method for managing each of the risks for pressure injury development individually and collectively.[19] For example, the patient may be adequately nourished but may fail to walk, stand, or reposition himself in bed. The Braden Scale allows targeted interventions. For this reason, it has been very useful in identifying specific at-risk patients and putting special provisions in place for these patients.

In your opinion, is there a higher rate of HAPIs among at-risk/high-risk acute care patients? (N = 241)



Are special provisions in place to address patients who are at risk, such as obese patients, orthopedic patients, elderly patients, transplant patients, critically ill patients, or those with a mobility level of less than 25 percent? (N = 240)



PRESSURE INJURY AND THE PATIENT OF SIZE

A high degree of adiposity places the obese patient at greater risk for pressure injury for several reasons. Circulation can be compromised in adipose tissue, thus interfering with tissue hydration and nourishment. Pressure injury can occur as atypical pressure injury, where pressure is directed toward areas not typical in the non-obese individual. The hazards of immobility can also be more profound for the obese patient because of pro-inflammatory conditions.

ASSESSMENT

Classification systems for staging or grading pressure injury have been evolving for more than a half century. The earliest system in the literature was developed by Guttman in 1955. Two decades later, Shea introduced the first well-documented staging classification system, consisting of a numeric grading system that was associated with the injury's severity. Shea used the degree of soft tissue damage to define four grades, 1 through 4, and closed pressure ulcer. Shea's closed pressure ulcer classification corresponds closely to the most recent definition of deep tissue injury by the National Pressure Ulcer Advisory Panel (NPUAP). Shea's Grade 1 was defined as an intact area of acute inflammatory response, while Grade 4 was defined as penetration of the fascia and severe undermining. Classification systems were also developed in 1959 by Campbell, in 1976 by Barton, and in 1981 and 1985 by Daniel, Priest, and Wheatley; however, the Shea system was the most widely used grading system in the United States until the late 1980s.[20]

In 1988, the International Association for Enterostomal Therapy (IAET), now known as the Wound, Ostomy and Continence Nurses' Society (WOCN), developed a widely used four-level staging system. The IAET staging system defined a Stage 1 pressure injury as an intact area of erythema not resolving within 30 minutes of pressure relief. A Stage 4 pressure injury was defined as deep tissue destruction extending through subcutaneous tissue to fascia and involving muscle, bone, or tendon.

In 1989, the NPUAP held the first Consensus Conference to address pressure injury classification. A four-stage classification system similar to the previously developed systems was debated and ultimately approved. This staging system was adopted by WOCN and was the standard for pressure injury staging until 2007. In 2007, the staging system was redefined by the NPUAP in the United States and the European Pressure Ulcer Advisor Panel (EPUAP) and included Stages 1–4, plus Suspected Deep Tissue Injury and Unstageable Pressure Ulcers.[21] Most recently, the NPUAP, EPAUP, and WOCN (2016) agreed on staging and naming conventions of Stages 1–4 as follows: Deep Tissue Injury, Unstageable Pressure Injury, Medical Device Related Pressure Injury, and Mucosal Membrane Pressure Injury.[22]

Stage 1 Pressure Injury refers to non-blanchable erythema of intact skin. This type of skin injury may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these correspond to deep tissue pressure injury.

Stage 2 Pressure Injury is described as partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, and moist and may also present as an intact or ruptured serum-filled blister. Adipose tissue and deeper tissues are not visible. Granulation tissue, slough, and eschar are not present. Stage 2 injuries commonly result from adverse microclimate and shear in the skin over the pelvic region and shear in the heel. This stage should not be used to describe moisture-associated skin damage (MASD), including incontinence-associated dermatitis (IAD), intertriginous dermatitis (ITD), medical adhesive–related skin injury (MARSI), or traumatic wounds, such as skin tears, burns, and abrasions.

Stage 3 Pressure Injury is full-thickness skin loss, in which adipose tissue is visible within the ulcer. Granulation tissue and epibole are often present. Slough or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage, and bone are not exposed. If slough or eschar obscures the extent of tissue loss, this is considered an Unstageable Pressure Injury.

Stage 4 Pressure Injury presents as full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage, or bone. Slough or eschar may be visible. Epibole, undermining, and tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss, this is considered an Unstageable Pressure Injury.

Unstageable Pressure Injury is characterized by full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed.

Deep Tissue Pressure Injury is described as intact or non-intact skin with a localized area of persistent non-blanchable deep red, maroon, or purple discoloration or epidermal separation revealing a dark wound bed or blood-filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense or prolonged pressure and shear forces at the bone–muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle, or other underlying structures are visible, this indicates a full-thickness pressure injury, such as Unstageable, Stage 3, or Stage 4.

Medical Device Related Pressure Injury results from the use of a device designed and applied for diagnostic or therapeutic purposes. The pressure injury typically conforms to the pattern or shape of the device. The injury should be staged using the staging system.

Mucosal Membrane Pressure Injury is found on the mucous membranes of a patient with a history of a medical device in use at the location of the injury. Due to the anatomy of the tissue, these ulcers cannot be staged.

Healing time is prolonged for more extensive and higher-staged injuries because of the nature of damage to the skin, soft tissue, and supporting structures. While about 75 percent of Stage 2 injuries heal within eight weeks, only 62 percent of Stage 4 pressure injuries ever heal, and only 52 percent heal within one year. It is important to note that a pressure injury does not regress in stage as healing occurs. A pressure injury that is becoming shallower with healing is described in terms of its original deepest depth, such as resolved Stage 3 Pressure Injury.

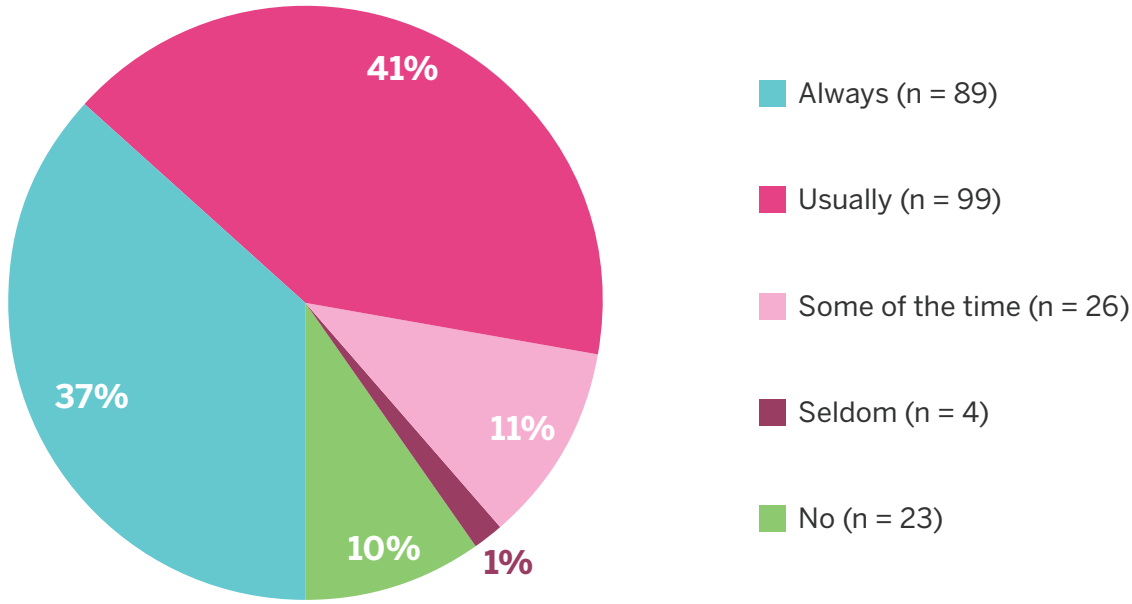
REPORTING

The National Database of Nursing Quality Indicators (NDNQI) is a national database that measures a number of nurse-sensitive quality indicators; one is the presence of hospital-acquired pressure injury. Nurse-sensitive indicators are considered to be distinct and specific to nursing and differ from quality indicators associated with other disciplines, such as medicine, therapy, or nutrition.[23,24] Prior to NDNQI, a consistent, standard method for national outcome reporting did not exist.

In 1990, researchers identified a need to understand the relationship between nurse staffing and the quality of care that patients received. A number of nurse-sensitive quality measures were identified and were tested in 1994 in pilot studies in Arizona, California, Minnesota, North Dakota, Ohio, Texas, and Virginia. In 1998, the American Nurses Association (ANA) created the NDNQI as part of its Safety and Quality Initiative. The NDNQI is physically located at Kansas University Medical Center School of Nursing and was initially funded by the ANA. The overarching goal for the NDNQI was to provide participant hospitals with national comparative unit-level data for use in quality improvement activities.[25] The database now includes more than 1,700 hospitals from all 50 states and Washington, DC.

Understanding the challenges involved with assessment and reporting has historically been an issue worthy of discussion.[26,27,28] Participating hospitals have training modules in place to reinforce the process for consistent assessment and reporting; however, clinical experts and researchers continue to recognize inconsistency as a threat to data collection, reporting, and management.[29,30]

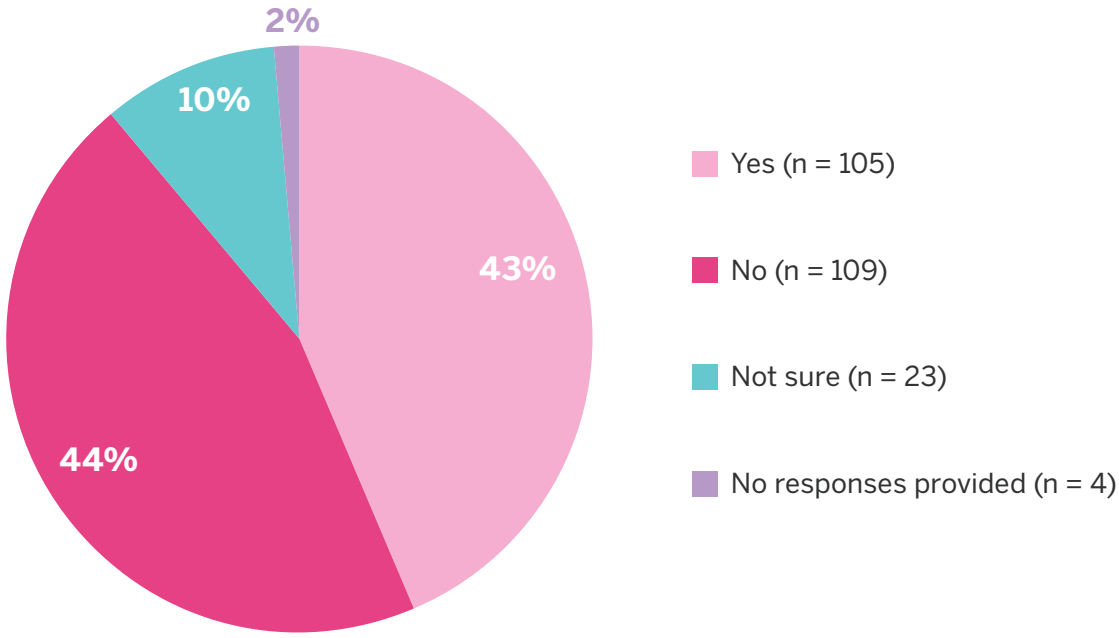
Does everyone collecting data in your facility have the same training? (N = 241)



VARIATION IN ASSESSMENT

Nurses around the globe continue to struggle with issues of variability in assessment and reporting. Skin color, comorbid conditions, and the multifactoral nature of many wounds pose challenges both individually and collectively. A number of types of skin breakdown may be mistakenly assessed as pressure-related. On the other hand, pressure injury can be mistaken for other types of full-thickness wounds. For instance, a full-thickness pressure injury may be mistaken for a full-thickness vascular or diabetes-related skin ulcer, calciphylaxis, pyoderma gangrenosum, necrotizing fasciitis, and more. All of these types of ulcers are full-thickness skin injuries, but if pressure, friction, or shear is not an etiologic factor, the injury is not a pressure injury. Confusion in these matters leads to issues with adequate reporting.

Do you believe Stage 3 and Stage 4 data assessment and reporting are always accurate? (N = 246)



METHODOLOGY

SURVEY

This project used a two-phase approach. Phase one incorporated an electronic survey sent to 14,000 wound care experts. Inclusion criteria for participation in the project included certification in wound care, practice in the field five years or longer, and practice in an acute-care or inpatient facility within the US. No incentive was offered to subjects for participation. A link to the cover letter—which included language of consent, a demographic collection tool, and the 10-item survey—was sent by HMP Communications (Malvern, PA). Responses to the 10-item survey were collected by Survey Monkey. Prospective subjects had eight days to complete the survey. Item 10 on the electronic survey invited subjects who practiced or were licensed in California to participate in phase two of the project.

INTERVIEWS

Phase two incorporated four one-to-one interviews. The interviews were recorded using the record function on an iPhone. The interviews followed a set of structured questions with opportunities to identify and explore additional findings. Participants in the interviews were offered a copy of the final white paper and a letter recognizing their contribution to the project.

RESULTS

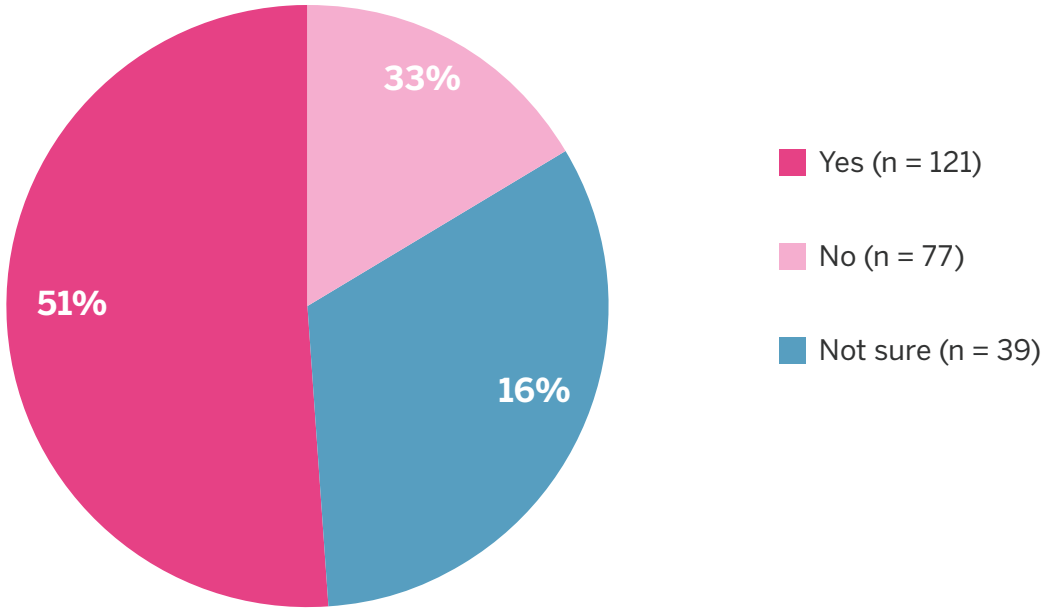
In phase one, 243 surveys were completed and submitted electronically to The Risk Authority Stanford (TRA Stanford). A convenience sample of four subjects who met inclusion criteria participated in phase two interviews.

All of the facilities in the survey sample had comprehensive pressure injury prevention and treatment programs. More than 50 percent of survey respondents acknowledged variation in assessment and reporting, while 30 percent of survey respondents expressed an understanding of the meaning of collaborative practice models, including safe patient handling and mobility (SPHM) practices.[31]

THE MEANING OF COLLABORATIVE PRACTICE

Collaborative Practice is a high-reliability term that refers to a health care delivery approach in which individual disciplines work together, have the same objectives and goals, and provide a plan of care that is individualized to the patient's needs. Collaborative Practice maximizes patient outcomes. The health care team works as a group, utilizing individuals' professional skills and talents to reach the highest of patient care standards. In order for a Collaborative Practice model of care to be successful, several conditions must be in place: Collaboration must have shared objectives. The participants must have similar value systems. Communication must be honest, respectful, and purposeful. Successful collaborative nursing practices and collaborative health care practices need to encompass all of these conditions. A Collaborative Practice model that includes safe patient handling and mobility, general pain management, and progressive mobility may serve to control the HAPI problem, as each of these individually and, more importantly, collectively address the problem of mobility.

At your facility, is the SPHM program linked to the pressure injury prevention program? (N = 237)



PRESSURE INJURY PREVENTION AND SPHM

Pressure-related skin injury has long been recognized as a hazard of immobility. A number of authors and organizations are recognizing the value of SPHM as a strategy to improve mobility and therefore reduce risks associated with immobility, such as HAPI.

The interviews provided a snapshot into the lived experiences of those who work each day either providing direct inpatient care or planning such care. Data collected in phase two provided information not readily captured by the survey. For instance, one interviewee explained that even though policies and procedures were in place, nurses in some patient care areas made personal/professional decisions about preventing and treating pressure injury rather than using accepted and approved practices. Another theme was the difficulty of properly assessing Stage 3 pressure injury, as so many skin pathologies share a similar appearance. All four respondents failed to understand the general relationship among pain management, safe patient handling, and progressive mobility as factors in HAPI prevention. The interviewees also did not recognize the specific link between SPHM and HAPI prevention. One interviewee stated, "How does a transfer machine prevent pressure injury?" Those interviewees whose facilities had transplant services had no special HAPI prevention plan to address the nuances of the patient having a transplant procedure.

Interestingly, one interviewee indicated that her HAPI rate was very high and later indicated during the course of the interview that she lacked administrative support. In contrast, an interviewee who had a HAPI rate of 0.1% indicated that her Chief Nursing Officer (CNO) supported efforts toward zero preventable harm and met with the leadership team and the WOCN weekly to meet that goal. Three out of four of the phase two subjects discussed economic constraints as a factor in HAPI development.

DISCUSSION

The pressure injury problem has become so profound that avoidable, hospital-acquired Stage 3 or 4 pressure injury is no longer a reimbursable condition in most circumstances. As a result, hospitals across the US are seeking ways to prevent this condition. However, a more comprehensive analysis of costs associated with this condition suggests that non-reimbursement for care is simply a portion of the expenses incurred by health care facilities related to pressure injury formation.

To that end, this project suggests not only that the true costs of pressure injury are not entirely understood but also that the basics of assessment, prevention, and reporting remain flawed. The value of a collaborative practice model that links HAPI prevention with safe patient handling, pain management, and progressive mobility is misunderstood. Opportunities exist to explore the true costs of HAPI by way of a decision analysis model. Further research to better understand an all-new approach to pressure ulcer prevention is in order.

AVOIDABLE OR UNAVOIDABLE PRESSURE INJURY?

Pressure injuries can develop even though the provider has evaluated the individual's clinical condition and pressure injury risk factors; defined and implemented interventions consistent with individual needs, goals, and recognized standards of practice; monitored and evaluated the impact of the interventions; and revised the approaches as appropriate. Avoidable pressure injury is thought to develop if one or more of the above has not been provided.

CONCLUSION

The pressure injury problem is increasing. HAPI prevention programs are in place but have been largely unchanged in principle for the past three decades. Inconsistencies exist in assessment and reporting. Little attention is directed to collaborative practice models, and few experts integrate SPHM practices into a HAPI prevention program.

SIGNIFICANCE

An opportunity exists to design an all-new approach to pressure injury prevention, assessment, and reporting. Opportunities also exist to more fully integrate SPHM and HAPI prevention into a collaborative practice model.

LIMITATION(S) OF THE PROJECT

The sample sizes for both the survey and, in particular, the interview were small.

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