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CHALLENGES IN PRACTICE

Teaching the Fruits of Pressure Ulcer Staging

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■ ABSTRACT

BACKGROUND: Accurate pressure ulcer staging is an important skill for nurses, physicians, physical therapists, and certified nursing assistants. Current education is based on the National Pressure Ulcer Advisory Panel's staging system. A review of the literature indicates variability in staging abilities of numerous healthcare providers. With this problem in mind, a new method of teaching pressure ulcer staging by visual analogy was developed.

METHODS: We used the current National Pressure Ulcer Advisory Panel definitions to create a training tool based on a visual analogy between the different pressure ulcer stages and common fruits and vegetables.

RESULTS: Initial feedback from a western states wound care conference indicates successful integration of teaching into nursing practice. A poster was also presented at the annual 2011 Wound, Ostomy and Continence Nurse's National Conference. Positive feedback was received from numerous Wound, Ostomy and Continence Nurse's members who requested an electronic copy of the poster.

CONCLUSIONS: Visual analogies can provide a method of teaching pressure ulcer staging across different disciplines with different levels of training involved in patient care.

KEY WORDS: decubitus ulcers, deep tissue injury, education, National Pressure Ulcer Advisory Panel, NPUAP, pressure ulcer, pressure ulcer staging, stage I, stage II, stage III, stage IV, unstageable

■ Introduction

More than 2.5 million individuals develop pressure ulcers (PUs) in the United States each year.[1] Pressure ulcers can occur in individuals of any age, gender, or race and result in potentially serious complications. Costs of treating PUs are substantial, both monetarily, and as it affects the patient's quality of life.

The occurrence of a PU is usually tracked using prevalence and incidence rates. Prevalence rates are defined as the number of cases found within a specific range of time, usually a 24-hour period. Incidence rates are defined as the number of new cases that develop in the same population during a given period of time, usually based on average length of stay for the type of facility.[2] Prevalence and incidence rates vary depending on the type of facility: acute, long-term acute, or long-term care.[3]

A 6-year study of 2200 acute care facilities in the United States found PU prevalence rates of 16%, and incidence rates of 7% for 2004, the final year of the study.[4] The International Pressure Ulcer Prevalence surveys completed between 1989 and 2005 indicated that PU prevalence rates had increased from 9.2% in 1989 to 15.2% in 2005.[3] However, in the 2008–2009 International Pressure Ulcer Prevalence Survey, VanGilder and colleagues[5] noted that the overall prevalence rates in the United States had decreased from 13.5% in 2008 to 12.3% in 2009, suggesting that increased prevention efforts exerted a positive effect.

The financial impact of PU on the healthcare system is significant. In 2001, the estimated average hospital cost for treatment of a stage III or IV PU ranged from $38,228 to $54,954, depending on whether the size of the PU is smaller or larger than 5 cm^2.[6] In 2004, the National Pressure Ulcer Advisory Panel (NPUAP) estimated that the annual direct cost of treating a facility-acquired PU was $400,000 to $700,000.[7] With ever-increasing healthcare costs, the financial impact to the healthcare system will continue to accelerate.

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Financial cost to patients and families also influences the economic impact of PU. Increased healthcare costs, higher deductible levels, higher insurance premiums, coverage limitations, and increasing numbers of uninsured persons affect healthcare expenses for patients and families.[8]

The morbidity of a PU, including associated pain, is an important component of PU impact. It was once thought that advanced stages of PUs produce minimal pain, but best current evidence suggests otherwise. One study of PU pain indicates that deeper PUs are proportionally associated with increasing levels of pain, especially during dressing changes.[9] In another study of PU pain, individuals noted that their PU pain was constant, no matter how they were positioned.[10] High pain levels experienced by the patient caused emotional distress for their families.[11] When a PU develops at home, caregivers frequently experience guilt and shame, feeling that they have failed to provide adequate care.[12] These caregivers also denied any outside teaching regarding PU treatment or prevention.

Changes in reimbursement for PU care occurred in 2007. The Centers for Medicare & Medicaid Services (CMS) made changes to reimbursement policies that withhold payment for PU treatment if the wound was acquired during the hospital stay.[13] According to the CMS policy, the admitting licensed independent provider must document the presence of any stage III or IV PU as being present on admission in order for the hospital to be reimbursed for treatment interventions. Meeting this requirement means that a thorough skin examination must be performed in a timely manner and appropriately documented in the patient record.[14,15]

Although current CMS policies require documentation by the physician or other licensed practitioner, it is often the nurse who performs the skin inspection. The nurse must be able to identify and correctly stage PU, followed by appropriate notification to the provider so additions can be made to the medical records.[14-16] Early recognition of a stage I or stage II PU is also clinically relevant because early recognition can lead to prevention of additional damage when preventive interventions are implemented.

Legal ramifications exist as a result of the CMS policies for PU. The Department of Health and Human Services has stated that PUs can "reasonably be prevented through the application of evidence-based guidelines."[17] Yet current evidence suggests that some PUs cannot be prevented even with implementation of prevention protocols and interventions.[18,19] Litigation may ensue when family members do not understand that some PUs are unavoidable, even when appropriate guidelines are followed. A classic example is the formation of a terminal ulcer, also known as "skin changes at life's end" (SCALE).[20]

To prevent PU development and meet the requirements of the CMS, education for healthcare providers regarding risk factors, skin assessment, staging, appropriate management, and thorough documentation is essential.[16] Skin assessment and accurate PU staging are fundamental. Healthcare providers must then implement the appropriate interventions in order to treat any identified PUs. In addition, healthcare staff must educate family members regarding PU etiology and prevention.[12]

Several hypotheses exist regarding the etiology of PU, but the precise mechanisms leading to ulcer formation is not entirely understood. These hypotheses include (1) micro-occlusion of blood flow to the tissues over bony prominences that are in contact with the sitting/lying surface; (2) blockage of lymphatic fluid leading to a build-up of toxins in the tissues; (3) tissue damage related to reperfusion of ischemic tissues with subsequent reactive hyperemia; and (4) tissue damage and necrosis resulting from direct mechanical insult.[21]

Ongoing research indicates that multiple factors may be involved in PU formation. Fecal or urinary incontinence, low albumin levels, being underweight, elevated body temperature, tachycardia or bradycardia, anemia, high creatinine levels, hip fracture, advanced age, and terminal illness may render the patient more vulnerable to tissue damage.[22,23] Additionally, diabetes mellitus, age > 70 years, and low Braden Scale scores are found to increase PU risk in critically ill patients.[24]

A number of validated instruments exist that may be used to assess PU risk, including the Braden Scale for Pressure Sore Risk.[25] The Braden Scale is the most commonly used risk assessment tool in the United States.[15]

Evidence suggests that education regarding PUs must be frequent and ongoing for both new graduate nurses and experienced clinicians.[15,26] While PU education occurs in the curriculum of nursing schools, the majority of nurses surveyed did not feel that they truly internalized these concepts until they had participated in the care of a patient with a serious PU.[26] Likewise, Zulkowski and Ayello[27] assessed both urban and rural nurses' knowledge of PUs, using the 47-item Pressure Ulcer Knowledge Test. Their findings indicated that less than half of new nurses, and less than 62% of experienced nurses, were confident in their ability to accurately recognize and stage PU. These findings are supported by a study conducted at a Brazilian university hospital among baccalaureate nurses with varying years of experience.[28] Chianca and colleagues[28] found significant knowledge deficits regarding PU staging and prevention techniques.

Education of other members of the healthcare team is equally important. Certified nursing assistants, resident physicians, physical therapists, and providers, including physicians, nurse practitioners, and physician's assistants, also must acquire the ability and skill to recognize stage PU. Education should be designed for each group of healthcare providers according to their role in providing patient care.[15]

In 2007, the NPUAP redefined a PU as 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 and/or friction.[29] They revised the PU stages (I through IV) by adding 2 categories: suspected deep tissue injury and unstageable.[29] These 6 categories are now the standard for PU staging across the spectrum of healthcare.

Methods to teach PU staging are primarily based on written definitions developed by the NPUAP and photographed illustrations. This educational approach has been found to achieve moderate success as evidenced by nurses' self-report and actual testing.[26,27] The purpose of this "Challenges in Practice" column is to describe a strategy that can help nurses and other healthcare providers remember and apply the NPUAP stages correctly.

Methods

An informal review of floor nurses' charted skin assessments suggests that floor nurses have difficulty remembering the various stages, particularly in differentiating between stages I or II, and stages III or IV. We determined that there was a need for a simple method of education with a visual analogy for staging PUs. With that in mind, we developed the following educational method.

This teaching method we developed uses commonly recognized objects (fruits and vegetables) put into the context of visual learning. Instead of memorizing lists of facts, we ask the learner to associate a particular fruit or vegetable with a PU stage. We selected the following objects—tomatoes, potatoes, apples, peaches, and eggplant—and associated each with a PU stage. We found that this technique provided a simple way to identify and differentiate various PU stages (Boxes 1 to 6).

Feedback

Preliminary feedback to this method of teaching PU staging was obtained at a wound conference in the Western United States that included 150 attendees. Attendees were nurses working in home care, acute care, long-term facilities, and nursing students. Anecdotal critique regarding the usefulness of the method was provided through a written evaluation form. Most comments focused on the value of the method in helping them remember the various stages. Comments included "made it rememberable," "will be easier to remember stages when you think of fruits," and "perfect analogy." This educational approach was also presented as a poster presentation at the national 2011 WOCN conference with similar responses by the attendees (see Supplemental Digital Content 1, http://links.lww.com/JWOCN/A23 to view the poster).

BOX 1.

Stage I Pressure Ulcer and Corresponding Vegetable

The NPUAP defines a stage I pressure ulcer as intact skin with nonblanchable redness of a localized area usually over a bony prominence.[29] Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area. The NPUAP further characterizes a stage I PU as a painful, firm, soft, warmer, or cooler area as compared to adjacent tissue. Stage I may be difficult to detect in individuals with dark skin tones.

Corresponding Vegetable

The visual picture of a stage I pressure ulcer is linked with the image of a ripe, red tomato (Figures 1 and 2). The redness of a tomato represents nonblanchable skin. It does not matter how long firm, gentle pressure is applied; it will not blanch. This reinforces the principle that a stage I pressure ulcer is nonblanchable.

FIGURE 1. Tomato.

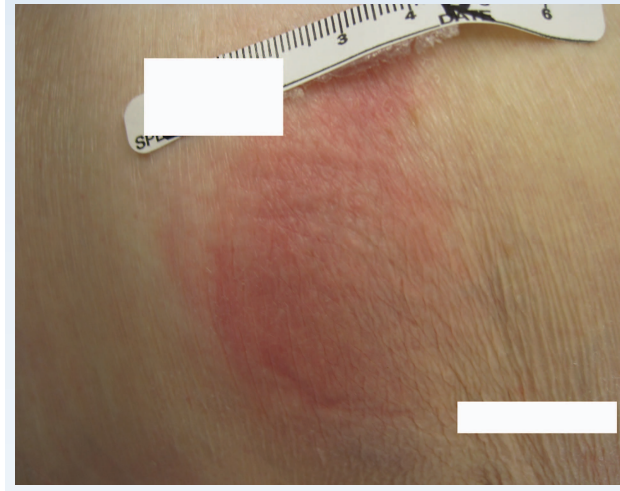

FIGURE 2. Stage I pressure ulcer.

BOX 2.

Stage II Pressure Ulcer and Corresponding Vegetable

The NPUAP defines a stage II PU as partial-thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough.[29] A stage II PU also may present as an intact or open/ruptured serum -filled blister. These wounds may be characterized by a shiny or dry shallow ulcer without slough or bruising because it indicates suspected deep tissue injury. The term stage II PU should not be used to describe skin tears, tape burns, incontinence-associated dermatitis, maceration, or excoriation.

Corresponding Vegetable

Imagine that a potato peeler has been swiped across the surface of a potato, leaving a superficial opening to the potato's skin (Figures 3 and 4). This represents a stage II pressure ulcer. It is a partial loss of the dermis, superficial, and does not provide a view to any underlying subcutaneous tissue.

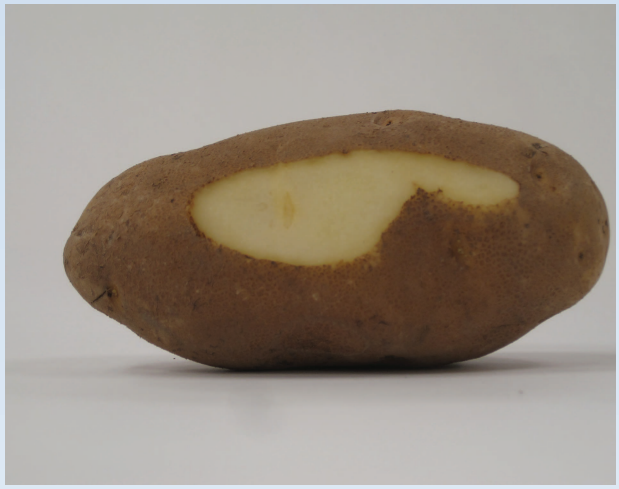

FIGURE 3. Potato with partial removal of potato skin.

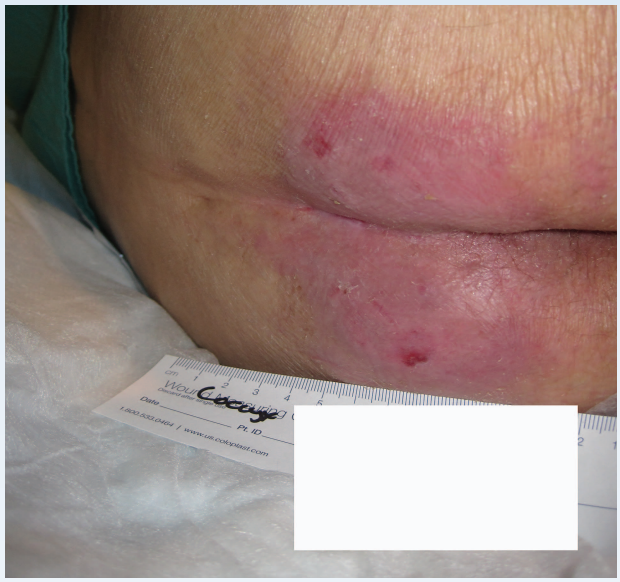

FIGURE 4. Stage II pressure ulcer.

BOX 3.

Stage III Pressure Ulcer and Corresponding Fruit

A stage III PU is defined as full-thickness tissue loss; subcutaneous fat may be visible but bone, tendon, or muscle is not visible or directly palpable.[29] Slough may be present but does not obscure the depth of tissue loss. A stage III PU may include undermining and tunneling. The NPUAP notes that the depth of a stage III PU varies by anatomical location. The bridge of the nose, ear, occiput, and malleolus does not have subcutaneous tissue and stage III PU in these areas can be shallow. In contrast, areas of significant adiposity can develop extremely deep stage III PU.

Corresponding Fruit

The example fruit is an apple with a bite taken from it (Figures 5 and 6). This shows complete loss of the skin to the area and underlying tissues and is much deeper than the peeled portion of the potato. However, no underlying structures, such as fascia, bone, or tendon, are visible. The bitten apple represents a visualization of the wounded subcutaneous tissue only. The core of the apple is not visible in this representation.

FIGURE 5. Apple with bite removed.

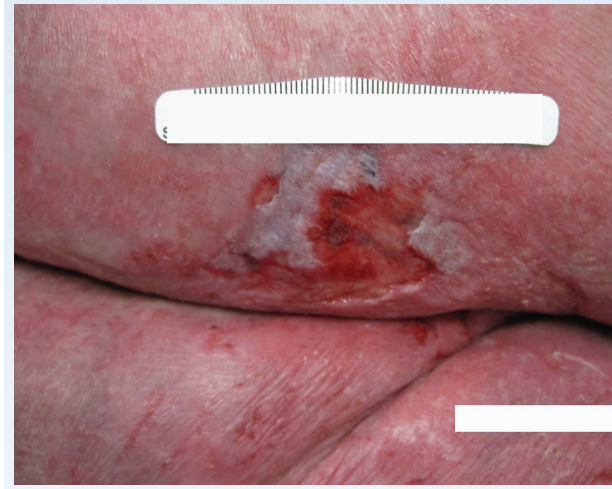

FIGURE 6. Stage III pressure ulcer.

BOX 4.

Stage IV Pressure Ulcer and Corresponding Fruit

The NPUAP defines a stage IV pressure ulcer as full-thickness tissue loss with exposed bone, tendon, or muscle.[29] Slough or eschar may be present on some parts of the wound bed; stage IV PUs often contain undermining and tunneling. The depth of a stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput, and malleolus does not have subcutaneous tissue and these ulcers can be shallow. Stage IV ulcers can extend into muscle and/or supporting structures (eg, fascia, tendon, or joint capsule), making osteomyelitis possible. Exposed bone/tendon is visible or directly palpable.

Corresponding Fruit

We selected a peach that has a deep bite taken from the side to represent a stage IV PU (Figures 7 and 8). The peach pit is visible in the base of the wound and indicates both visually and by palpation that the underlying structures are visible: bone or joint capsule. This is a graphic reminder of the definition of a stage IV pressure ulcer.

FIGURE 7. Peach with full bite removed.

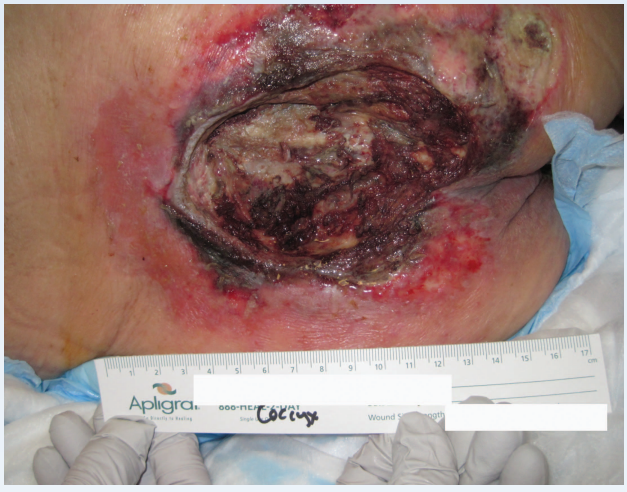

FIGURE 8. Stage IV pressure ulcer.

BOX 5.

Unstageable Pressure Ulcer and Corresponding Fruit

One of the two newest classifications by the NPUAP is the unstageable PU.[29] It is defined as full-thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green, or brown) and/or eschar (tan, brown, or black) in the wound bed. The NPUAP further noted that until enough slough or eschar is removed to expose the base of the wound, its true depth and stage cannot be determined. They further observed that stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as "the body's natural (biological) cover" and should not be removed.

Corresponding Fruit

The visual analogy selected for an unstageable PU was a rotten peach (Figures 9 and 10). The peach skin is not intact, but the rotted portions of peach flesh obscure the true depth of the damage. With this stage of PU, the clinician is unable to assess whether the damage extends to the underlying structures, bone, joint, or tendon, or whether damage stops in the area of subcutaneous tissue.

FIGURE 9. Peach with rotten area.

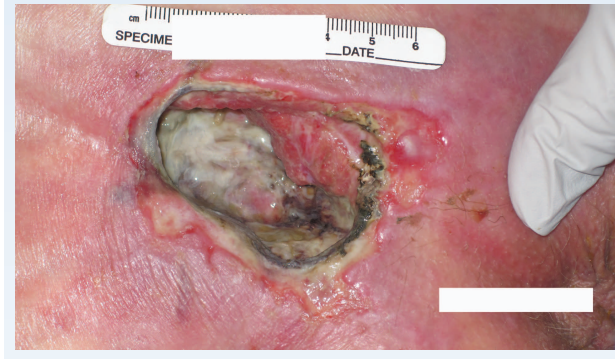

FIGURE 10. Unstageable pressure ulcer.

BOX 6.

Suspected Deep Tissue Injury and Corresponding Vegetable

The second new PU classification identified by the NPUAP is suspected deep tissue injury.[29] It is defined as a purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer, or cooler as compared to adjacent tissue. It was further noted that deep tissue injury may be difficult to detect in individuals with dark skin tones. Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar. Evolution may be rapid exposing additional layers of tissue even with optimal treatment.

Corresponding Vegetable

We chose a purple eggplant to represent a suspected deep tissue injury (Figures 11 and 12). The skin covering the eggplant is intact. The purple coloring represents the presence of tissue injured by ischemia, pressure, and shear forces. Capillary bleeding from the injured and necrotic tissue is responsible for the discoloration. Because the skin is intact, the depth of the injury is unknown. Tissue damage may involve only superficial layers, or it may extend into the deeper structures. Deep tissue injury can quickly break down into an open wound.

FIGURE 11. Eggplant.

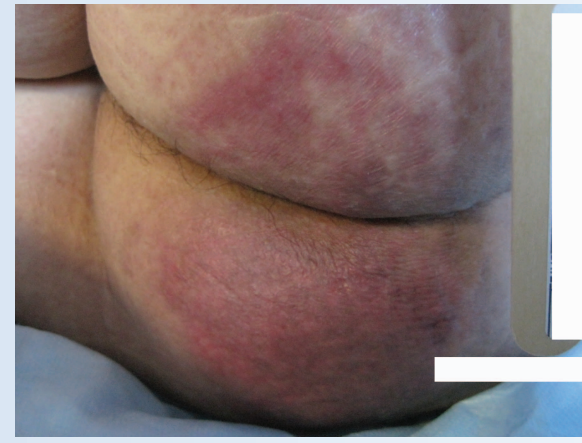

FIGURE 12. Deep tissue injury.

Conclusions

Pressure ulcers must be accurately recognized, staged, and documented in a timely manner, especially after admission to a hospital. Nurses are central to the identification process and must be educated on recognizing and staging PU. One of the challenges to this process is the development of more effective teaching approaches. This "Challenges in Practice" column presents a novel educational method that was designed to assist nurses in remembering the various stages through using visual analogies to various fruits and vegetables. Preliminary feedback from nurses indicates that this approach may be an effective technique for teaching nurses to accurately identify and stage PU.

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Call for Authors: Challenges in Practice

Our Challenges in Practice Section Editor invites case studies or multiple cases series that illustrate the importance of critical thinking or provide alternative or novel approaches to WOC management. This section is ideal for the novice author who has not published platform articles in JWOCN or other journals. Potential cases discussed on the WOC Web Forum that would translate into excellent Challenges in Practice articles include:

- Perineal erythema in a frail elderly patient nonresponsive to urinary stream diversion with an indwelling catheter
- Rationale for selecting a particular debriding technique based on wound type, care setting, and expertise within the facility
- Case studies or case series focusing on initial experiences with novel mattresses, wound care dressings, wound care devices, or other topical wound care therapies
- Case studies or case series focusing on unusual stomal or peristomal complications