Since 1989, the National Pressure Ulcer Advisory Panel’s (NPUAP) staging system has been one of the most widely used pressure ulcer classification systems (Maklebust & Margolis, 1995). The staging system was originally developed to guide clinical description of the depth of tissue destruction that occurs with pressure ulcers. In this article, the methods that guided the revision, and the updated definition of pressure ulcer and pressure ulcer stages will be addressed.

Over the years, the staging system continued to evolve. A greater understanding of the multifactorial pathogenesis of pressure ulcer development is emerging as a result of clinical, ultrasonography, and computer-aided, tomography-based research. For example, in 1997 the definition of Stage I pressure ulcers was changed to include identifying descriptors for those with darkly pigmented skin. After 5 years of research, discussion, and consensus building, the NPUAP pressure ulcer staging system was updated in 2007.

A pressure ulcer is “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” (NPUN, 1989). A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated. Since the early recorded history

The NationalPressure Ulcer Advisory Panel has updated the definition of a pressure ulcer and the stages of pressure ulcers based on current research and expert opinion solicited from hundreds of clinicians, educators, and researchers across the country. The amount of anatomical tissue loss described with each stage has not changed. New definitions were drafted to achieve accuracy, clarity, succinctness, clinical utility, and discrimination between and among the definitions of other pressure ulcer stages and other types of wounds. Deep tissue injury was also added as a distinct pressure ulcer in this updated system.

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of mankind, pressure ulcers have been known to afflict humans. The earliest documentation is from Hippocrates in 400 BC. Paget, in his clinical lectures on bedsores in 1873, said that pressure ulcers at times erupt from under intact skin. Even today, pressure ulcers remain a significant clinical, quality of life, economic, regulatory, and legal problem for providers and patients alike.

History of Pressure Ulcer Staging

Several classification systems for staging or grading of a pressure ulcer have been developed. The earliest system in the literature was developed by Guttmann in 1955. Shea, in 1975, developed the first well-documented staging method, consisting of a numeric classification system that was based in pathology. Shea defined each stage by its soft tissue damage. Shea’s system consisted of four grades, I-IV and a closed pressure ulcer, likened to today’s definition of suspected deep tissue injury. Shea’s Grade I was defined as an acute inflammatory response while Grade IV 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 in the United States until the late 1980s.

The International Association of Enterostomal Therapists (IAET), now known as the Wound, Ostomy, Continence Nurses’ Society (WOCN), developed a widely used four-level staging system in 1988. The IAET staging system defined a Stage I as “erythema of intact skin, the heralding lesion of skin ulceration.” A Stage IV was defined as “full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures (such as tendon, joint, capsule). Undermining and sinus tracts also may be associated with Stage IV pressure ulcers.”

The definition of Stage I pressure ulcer was updated in 1997 by the NPUAP to address detection in darker skin tones and was revised to “an observable pressure-related alteration of intact skin whose indicators as compared to an adjacent or opposite area on the body may include changes in one or more of the following: skin temperature (warmth or coolness), tissue consistency (firm or boggy feel), and/or sensation (pain, itching). The ulcer appears as an area of persistent redness in lightly pigmented skin, whereas in darker skin tones, the ulcer may appear with persistent red, blue or purple hues.”

The European Pressure Ulcer Advisory Panel (EPUAP) also has a staging system for pressure ulcers consisting of four grades developed in 1998. A Grade 1 pressure ulcer was defined as “non-blanchable erythema of intact skin. Discolouration of the skin, warmth, oedema, induration or hardness may also be used as indicators, particularly with darker skin.” A Grade 4 pressure ulcer consisted of “extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures with or without full thickness skin loss.”

Problems with Staging Systems

Inherent to the accuracy of pressure ulcer staging is: (1) knowledge of the integumentary anatomy and deeper tissue layers including the ability to identify and differentiate between these layers; (2) assessment and differential diagnostic skill (Nix, 2006); (3) and validity (accuracy) and reliability (consistency of results) of the staging system. Illustratively, a 2007 inter-rater reliability study comparing pressure ulcer staging between staff nurses and certified wound, ostomy, continence nurses (CWOCN) in two National Database of Nursing Quality Indicators (NDNQI) prevalence surveys using the NPUAP staging system reported a 65% agreement between raters Kappa = 0.514 across all stages of pressure ulcers (Nickoley, Helvig, Ritter, & Heinsler, 2007). Of the 235 “potential pressure ulcers identified,” 16.6% were eliminated from the study as they represented etiologies other than pressure (such as candidiasis, maceration, denudement) (Nickoley et al., 2007).

Comparatively, 44 pressure ulcer experts were asked to classify lesions, using 56 photographs, as normal skin, blanchable erythema, pressure ulcers using the EPUAP grades 1 to 4 or incontinence lesions (Defloor & Schoonhoven, 2004). The percentage of agreement was 94.5% and the multi-rater Kappa was 0.80 (Defloor & Schoonhoven, 2004). Lesions secondary to incontinence were most often misclassified as grade 2 (blisters) or grade 3 pressure ulcers (Defloor & Schoonhoven, 2004).

Staff nurses frequently exhibit uncertainty in accurately differentiating between Stage II, Stage III, and lesions secondary to moisture and/or friction (Doughty et al., 2006; Defloor et al., 2005; Pieper & Mattern, 1997). Given the ulcer’s anatomical location, herpetic, fungal, and moisture lesions are often misclassified as pressure ulcerations (Defloor et al., 2005).
Neuropathic foot ulcers, epidermal stripping from adhesive removal, reactive hyperemia, bruises, radionecrosis, surgical wounds, and ulcers secondary to venous and arterial insufficiency have also been staged incorrectly using the NPUAP system. Diagnostic inaccuracies result in inappropriate prevention and treatment interventions, misappropriated health care expenditures with the potential for punitive regulatory, litigious, and quality implications.

Deep Tissue Injury as an Etiology

In 2001, the concept of another etiology for pressure ulcers was discussed by the NPUAP. These pressure ulcers were known to begin as “purple” or “bruised” looking tissue and many had a propensity to become large Stage IV ulcers quickly (Black & Black, 2003). The term “deep tissue injury” was selected because it was likely that the etiology of these pressure ulcers was high levels of pressure at the bone-muscle interface. Deep tissue injury (DTI) was initially defined as “A pressure related injury to subcutaneous tissues under intact skin. Initially, these lesions have the appearance of a deep bruise and they may herald the development of subsequent development of a Stage III-IV pressure ulcer even with optimal treatment” (NPUAP, 1997).

A task force was formed and a thorough review of the literature was conducted to determine previous documentation on the phenomenon of DTI. Surprisingly, some existed. In 1873, Paget wrote that ulcers could erupt from intact skin and that tissue may be purple or yellow from extravasation of blood. He went on to say, the deeper tissues die, including muscles and bones, where sloughing follows in the skin and fat and the place under the skin ulcer is empty. Groth (1942), a German scientist, created ulcers in an animal model by applying external pressure and described these ulcers that started in muscle as “malignant.” Even Shea in 1975, in addition to defining the stages of pressure ulcers, included a “closed pressure ulcer.” Through these sentinel pieces of literature it was apparent that the idea of a DTI pressure ulcer was not new, but had been overlooked with the current staging system. A literature review identified many variations in terminology used to describe DTI (Ankrom et al., 2005).

Updating of the NPUAP Staging System

When the NPUAP pressure staging system was first developed, knowledge of pathology leading to pressure ulcers was more limited, suspected DTIs were not considered and differential diagnoses of lesions secondary to incontinence and friction were not addressed. In using the 1997 NPUAP staging system, suspected DTIs were often misclassified as Stage I pressure ulcers. In sampling the national pulse on the issue of deep tissue injury, a series of international, national, regional, and local presentations to wound care providers clinically validated that DTI pressure ulcers remained a significant, yet poorly understood, clinical problem.

NPUAP has used the process of consensus conferences since 1987 to gain a greater understanding of issues for which there was little scientific literature. The 2005 NPUAP Consensus Conference focused on deep tissue injury. Consensus was reached that deep tissue injury is a form of pressure ulcer and that the addition of DTI into the staging language would help guide more aggressive, early, appropriate treatment interventions that may lead to better outcomes. It was also agreed that DTI has a questionable knowledge base and a complex pathogenesis, so there is a need for reliable and valid clinical indicators and definitions to improve outcomes and clarify statistical reports of prevalence and incidence. The Consensus Conference group also agreed that the existing staging system did not capture the idea of DTI, which motivated ongoing work by NPUAP to revise the staging system. The existing definitions of Stage I and II had too many variations and it was agreed that denudement from urine and feces, maceration from moisture, and friction injury did not fit into the staging nomenclature. The full results of this Consensus Conference were published in 2005 (Black & the National Pressure Ulcer Advisory Panel, 2005).

Through many venues, DTI was validated as an etiology of pressure ulcers. While little formal study has been done on these pressure ulcers, it was agreed by clinical experts that they do exist. How to describe them using the staging system remained unclear. DTI could be called a variant of Stage I or unstageable using the current terms. Stage I pressure ulcers have classically been accepted as ulcers that can heal on their own without regeneration of significant tissues or production of scar. The placement of DTI may not fit well in the Stage I category, except to indicate that in its closed presentation it heralds the development of more severe ulcers.

Staging deep tissue injury as an unstageable type of pressure ulcer was also recommended. NPUAP has recommended that DTI be documented in the unstageable category in those health systems where placement is mandatory (such as MDS, computerized documentation) because the true extent of the wound is not known. When a health care system uses narrative documentation, objective description was recommended along with the label of suspected deep tissue injury or deep tissue injury. However, the more traditional use of the label unstageable was for wounds covered with slough or eschar, in which the true depth of the wound was obscured until debridement. It is not expected that all DTI will require debridement. Further, the collapsing of DTI into an unstageable category may prolong the ability to fully understand the phenomena. The EPUAP also recognizes the clinical phenomena and has elected...
to classify DTI as a Grade IV pressure ulcer because of its presumed depth and severity of tissue damage. However, not all DTIs evolve into full-thickness ulcers. If identified early, ischemic and injured tissues may be salvageable with offloading and reperfusion, although basic science and clinical research is needed in this area.

Reexamining and Updating The Definition and Stages

At the 2005 Consensus Conference the NPUAP achieved its goal of clarifying the understanding of deep tissue injury, yet soon realized that deep tissue injuries did not neatly fit into the current staging system. Thus began an intensive 2-year examination and revision of the entire staging system. Current research was analyzed. Opinions were actively solicited from researchers, clinicians, educators, and public policymakers at a variety of public meetings and forums. NPUAP alumni were invited to participate. NPUAP board members engaged their colleagues at the EPUAP to discuss their common concern of accurately staging (or grading) pressure ulcers. Based on this ongoing feedback, NPUAP members drafted multiple iterations of a pressure ulcer staging system and sought expert critique and feedback.

Definitions were drafted with the goal of achieving accuracy, clarity, succinctness, clinical utility, and discrimination between and among other definitions for both stages of pressure ulcers and other types of wounds. A key determinant of accuracy was available scientific evidence. Brevity was emphasized in drafting definitions. Each definition includes a “further description” to support educational efforts and refine clinical utility and clarity.

In 2005, the NPUAP posted a draft of the staging definitions on its Web site and solicited public comment. Participants were asked to rate the qualities of clarity, succinctness, accuracy, and discrimination for each definition. Unlimited space was provided for recommendation for revision. Two hundred volunteers participated in the survey, representing 45 of 50 states. The majority of respondents were CWOCNs or nurses with wound care experience. Some physicians, physical therapists, and administrators also responded. Percent agreement for the qualities of clarity, succinctness, accuracy, clinical utility, and discrimination ranged from 56% to 75% for deep tissue injury, 76% to 91% for Stage I, 83% to 95% for Stage II, 83% to 96% for Stage III, 72% to 98% for Stage IV, and 73% to 90% for the definition of unstageable pressure ulcers. While these results were encouraging, the NPUAP examined all comments contained in a 60-page report and made further improvements to the staging definitions. This lengthy validation and refinement process set the stage for the 2007 NPUAP Consensus Conference.

During the 2007 Consensus Conference, attendees were asked to use the updated definitions of pressure ulcers to classify 30 photographs of pressure ulcers and other dermal lesions. Percent of agreement was computed with an average of 60% for all photos. This majority of inaccuracies were due to classification of pressure ulcers on the foot or heel in patients with diabetes or arterial inflow diseases as diabetic foot ulcers or arterial ulcers, rather than pressure ulcers.

The Updated Staging System

The updated staging system is presented in Figure 1. The goal of the revision was to clarify each stage and reduce the number of incorrectly staged ulcers or other types of wounds and skin lesions. Integrated into the staging system is an assumption that the ulcer is due to pressure, hence other etiologies of wounds are not only inaccurately classified as pressure ulcers, but the understanding of their etiology is imperative for the prescription and choice of treatments.

Deep tissue injury. Deep tissue injury is the newest pressure ulcer in the updated staging system. The definition of DTI was derived from multiple clinical cases as “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. Today, many of the cases of DTI are recognized after the fact and the word “suspected” can be added to the clinical diagnosis. Note that blood blisters have been included in this definition. NPUAP believes that blood blisters represent a deeper level of injury than a serum-filled blister yet the true depth of tissue damage is not known. NPUAP realizes that deep tissue injury may be difficult to detect in individuals with dark skin tones and placed this information in the description of deep tissue injury. Also, from retrospective data review, it is fairly well known that evolution of DTI may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar. It may heal or evolve rapidly, exposing additional layers of tissue even with optimal treatment.

Stage I. NPUAP continues to view Stage I pressure ulcers as a sign of risk. The updated definition is “intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.” Further description of a Stage I is “The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Stage I may be difficult to detect in individuals with dark skin tones. May indicate ‘at risk’ persons (a heralding sign of risk).”

An important component of the revision of the Stage I definition was to remove any reference to deep tissue injury (see later discussion). Stage I pressure
A pressure ulcer is 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. Pressure ulcers are staged using the following system.

<table>
<thead>
<tr>
<th>PRESSURE ULCER STAGES</th>
<th>Definition and Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suspected Deep Tissue Injury</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Stage I</strong></td>
<td>Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.</td>
</tr>
<tr>
<td><strong>Stage II</strong></td>
<td>Partial-thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.</td>
</tr>
<tr>
<td><strong>Stage III</strong></td>
<td>Full-thickness tissue loss. Subcutaneous fat may be visible but bone, tendon, or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.</td>
</tr>
</tbody>
</table>

Further description:
- The depth of a Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput, and malleolus do not have subcutaneous tissue and Stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep Stage III pressure ulcers. Bone/tendon is not visible or directly palpable.
- Full-thickness tissue loss with exposed bone, tendon, or muscle. Slough or eschar may be present on some parts of the wound bed. Often includes undermining and tunneling.
- 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. Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined. 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.

This staging system should be used only to describe pressure ulcers. Wounds from other causes, such as arterial, venous, diabetic foot, skin tears, tape burns, perineal dermatitis, maceration, or denudement should not be staged using this system. Other staging systems exist for some of these conditions and should be used instead.

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shallow open ulcer with a red or pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.” Blood blisters are thought to be due to damage to tissues deeper than the dermis and are not to be classified as a Stage II. Similarly, the presence of slough on a pressure ulcer bed also indicates damage to deeper tissue and these ulcers should not be classified as a Stage II.

Further descriptions of a Stage II pressure ulcer include that it presents as a shiny or dry shallow ulcer without slough or bruising. Bruising indicates suspected deep tissue injury. This stage should not be used to describe skin tears, tape burns, perineal dermatitis, maceration, or denudement.

Stage III. The NPUAP goal for updating of Stage III pressure ulcers was to address the idea of variations in the appearance of a Stage III ulcer. The updated definition of Stage III pressure ulcers is “Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.” The depth of a Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput, and malleolus do not have subcutaneous tissue and Stage III ulcers can be shallow in these locations. In contrast, areas of significant adiposity can develop extremely deep Stage III pressure ulcers. Bone/tendon is not visible or directly palpable.

Another common clinical issue is describing the healing pressure ulcer over time. While staging represents what can be seen, it cannot describe history nor should it be used to describe healing (reversed staging). Healing of pressure ulcers is more accurately monitored through the Pressure Ulcer Scale for Healing (PUSH Tool) (Stotts et al., 2001). There is a continuing need to communicate about the history of the wound, including the past stages of the pressure ulcer to enhance patient care in all settings. Stage IV pressure ulcers may appear to be Stage III ulcers while they are healing, but they should be classified as healing Stage IV ulcers. Stage IV pressure ulcers often require a full year to heal and once healed, the ulcer site remains an area of risk because the scar tissue has only 40% of the original tissue tensile strength.

Stage IV. The Stage IV pressure ulcer definition required the least amount of revision. The updated definition is “Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.” Further description of a Stage IV is included to help discriminate it from Stage III pressure ulcers and includes “The depth of a Stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput, and malleolus do not have subcutaneous tissue and these ulcers can be shallow. Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule) making osteomyelitis possible. Exposed bone/tendon is visible or directly palpable.” NPUAP recognizes that palpation of bone is outside the scope of practice for some clinicians.

Unstageable Pressure Ulcers

The goal for revising the definition of unstageable ulcers was to reduce the tendency to classify an ulcer with any necrotic tissue as unstageable, when the depth of the ulcer can be seen. The new definition is “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.” Note the phrase “the base of the ulcer” is used to denote the inability to determine the depth. If necrotic tissue is present, for example, on the edge of the ulcer, but the base is bone, the ulcer should be staged as a Stage IV. Further description of Stage IV ulcers include these phrases: “Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined. 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.”

Wounds that are obscured from view by dressings, braces, or casts should not be staged as unstageable. Likewise, do not assume the previous stage persists until the ulcer is visualized. Documentation should denote that the wound was not staged due to these products/devices. It is recommended that upon admission, every attempt be made to see the wound and not rely solely on the history of the wound.

Future Plans

Further basic science and clinical research is needed in order to validate the NPUAP pressure ulcer staging system and evaluate the effectiveness of educational programs aimed at enhancing interrater and intra-rater reliability of the staging system. Issues related to public policy, research, and education related to the updated staging definitions were discussed at the Consensus Conference. Attendees rated the issues in public policy, education, and research and these ratings will guide NPUAP’s future plans. Future Consensus Conferences will address this continuing agenda.

Conclusion

NPUAP has updated the staging system for pressure ulcers to improve clinical accuracy, clinical utility, and discrimination from other dermal wounds. The purpose of a staging system is to provide a method of communicating about the amount of anatomical tissue loss in a pressure ulcer. Accurate staging is critical for care planning and communication. While staging represents what can be seen, it cannot describe history nor should it be used to describe
healing (reversed staging). There is a continuing need to communicate about the history of the wound, including the past stages of the pressure ulcer to enhance patient care in all settings.

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Additional Readings
