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Revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System

Revised Pressure Injury Staging System

Laura E. Edsberg ♦ Joyce M. Black ♦ Margaret Goldberg ♦ Laurie McNichol ♦ Lynn Moore ♦ Mary Sieggreen

ABSTRACT

Our understanding of pressure injury etiology and development has grown in recent years through research, clinical expertise, and global interdisciplinary expert collaboration. Therefore, the National Pressure Ulcer Advisory Panel (NPUAP) has revised the definition and stages of pressure injury. The revision was undertaken to incorporate the current understanding of the etiology of pressure injuries, as well as to clarify the anatomical features present or absent in each stage of injury. An NPUAP-appointed Task Force reviewed the literature and created drafts of definitions, which were then reviewed by stakeholders and the public, including clinicians, educators, and researchers around the world. Using a consensus-building methodology, these revised definitions were the focus of a multidisciplinary consensus conference held in April 2016. As a result of stakeholder and public input, along with the consensus conference, important changes were made and incorporated into the new staging definitions. The revised staging system uses the term injury instead of ulcer and denotes stages using Arabic numerals rather than Roman numerals. The revised definition of a pressure injury now describes the injuries as usually occurring over a bony prominence or under a medical or other device. The revised definition of a Stage 2 pressure injury seeks to clarify the difference between moisture-associated skin damage and injury caused by pressure and/or shear. The term suspected has been removed from the Deep Tissue Pressure Injury diagnostic label. Each definition now describes the extent of tissue loss present and the anatomical features that may or may not be present in the stage of injury. These important revisions reflect the methodical and collaborative approach used to examine the available evidence and incorporate current interdisciplinary clinical expertise into better defining the important phenomenon of pressure injury etiology and development.

KEY WORDS: Deep tissue pressure injury, Shear, Pressure injury, Pressure, Pressure ulcer, Stage 1-4, Staging System.

INTRODUCTION

The National Pressure Ulcer Advisory Panel (NPUAP) has revised the definition and stages of pressure injury. The revision was undertaken to incorporate the current understanding of the etiology of pressure injuries and to clarify the ana-

tomical features present or absent in each stage of injury. An NPUAP-appointed Task Force reviewed the literature and created drafts of definitions, which were then reviewed by stakeholders and the public, including clinicians, educators, and researchers around the world. Using consensus-building methodology, these revised definitions were the focus of a multidisciplinary consensus conference held in April 2016. As a result of stakeholder and public input, along with the consensus conference, important changes were made and incorporated into the new staging definitions. The new revised staging system uses the term injury instead of ulcer and denotes stages using Arabic numerals rather than Roman numerals.

Pressure injuries are classified and described through the use of staging systems. Staging systems describe the extent of tissue loss and the physical appearance of the injury caused by pressure and/or shear. In 1975, J. D. Shea developed a staging system for the classification of pressure injuries, and in 1988, the International Association of Enterostomal Therapy (now the Wound, Ostomy and Continence Nurses Society), created a 4-stage system based on these classifications.^{1,2} In 1989, the NPUAP developed a pressure injury staging system, using a consensus conference model; this taxonomy was based on the International Association of Enterostomal Therapy system. In 2007, the NPUAP revised their staging system to incorporate suspected Deep Tissue Injury (sDTI) again using the consensus conference model. The first NPUAP-EPUAP International

Laura E. Edsberg, PhD, Natural Sciences, Center for Wound Healing Research, Daemen College, Amherst, New York.

Joyce M. Black, PhD, RN, CWCN, FAAN, College of Nursing, University of Nebraska Medical Center, Omaha.

Margaret Goldberg, MSN, RN, Certified WOC Nurse, Delray Wound Treatment Center, Delray Beach, Florida.

Laurie McNichol, MSN, RN, GNP, CWCN, CWON-AP, CNS/WOC Nurse, Cone Health, Greensboro, North Carolina.

Lynn Moore, RDN, LDN, Nutrition Systems Consulting, Jackson, Mississippi.

Mary Sieggreen, MSN, RN, CNS, NP, CVN, Harper Hospital, Detroit Medical Center, Detroit, Michigan.

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The authors declare no conflicts of interest.

Correspondence: Laura E. Edsberg, PhD, Center for Wound Healing Research, Daemen College, 4380 Main St, Amherst, NY 14226 (Ledsberg@daemen.edu).

DOI: 10.1097/WON.0000000000000281

BOX 1.**Pressure Injury Definition****Definition**

A pressure injury is localized damage to the skin and 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, comorbid conditions, and condition of the soft tissue.

Teaching Points

- Determine etiology and presence of pressure and/or shear.
- Pressure or shear can be related to a medical or other type of device.
- Cleanse the ulcer to remove loose debris and validate the etiology is pressure or shear and then use the staging system to stage pressure injuries appropriately.
- When labeling a pressure injury, use correct anatomical terms to identify its location on the body.

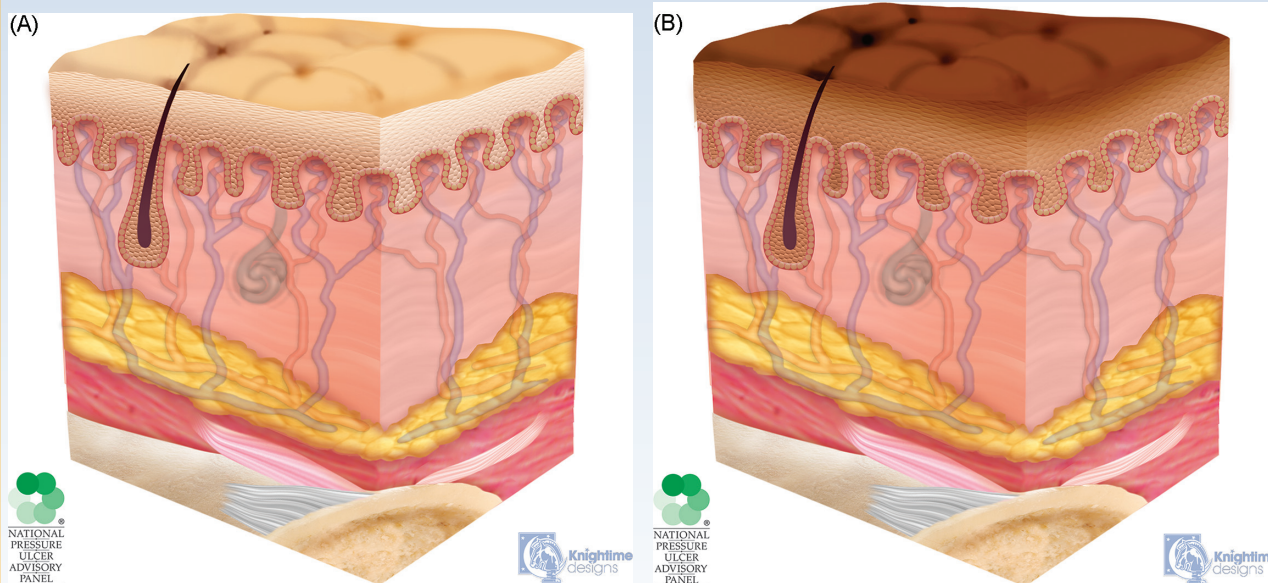


Figure 1a. Lightly pigmented healthy skin.

Figure 1b. Darkly pigmented healthy skin.

Consensus Conference Discussion and Comments From Stakeholders

Themes of stakeholder and public comments received prior to the conference primarily centered on inclusion of the term “medical device” in the definition. The development of the terminology for medical device–related pressure ulcers (now injuries) in 2010 led to an intense interest in these types of injuries.¹⁰

Consensus conference discussion focused on the many different types of nonmedical devices, from handcuffs to cell phones that can be involved in the development of pressure injuries. The role of medical devices as an etiology of pressure injury versus a stage of pressure injury was discussed extensively. Therefore, the definition of a pressure injury was expanded to include “medical and other types of devices” (Box 2).

Pressure Ulcer Prevention and Treatment Guidelines (2009) further revised the staging system for international use by adding the term category/stage, which is frequently used outside the United States.³ The NPUAP’s staging system has been widely adopted internationally. Pressure injury staging has become the basis for treatment, comparison of outcomes, and, if applicable, reimbursement. The NPUAP Staging System was evaluated and revised to reflect current scientific and clinical understanding of the etiology of pressure injuries, as well as to clarify and make the system more accurate and easier to use.

Only pressure injuries should be staged with the NPUAP Pressure Injury Staging System. Non–pressure-related ulcers and wounds are subject to unique staging or classification systems based upon wound type: diabetic foot ulcers (Wagner Classification System), venous leg ulcers (Clinical Etiology Anatomy Pathophysiology), skin tears (International Skin Tear Advisory Panel), adhesive or tape injuries (Medical Adhesive Related Skin Injury categories, MARS), and burn

classification (total body surface area). It is essential that the intended staging or classification system be used for each type of injury to ensure appropriate treatment. Prior to using any pressure injury staging or classification system, it is necessary to assess the patient and wound type; for example, when diagnosing a pressure injury, it is essential to confirm the presence of pressure and/or shear as a causative factor. Since the NPUAP staging system is based on the extent of tissue damage, an understanding of anatomy is essential when evaluating the type of tissue present in the wound. In order to perform an accurate visual assessment, pressure injury staging should take place only after the wound bed has been cleansed. The purpose of this article was to describe issues associated with accurate staging of pressure injuries, to report the methods undertaken to revise the NPUAP staging system, and to present the new NPUAP Staging System definitions. In addition, injuries commonly mistaken for pressure injuries are described and important teaching points are included that can be used to

TABLE 1.
Summary of Consensus Statements and Outcomes

Consensus Statement	Vote	Outcome
Pressure injury		
Include medical device–related pressure injuries as a cause in the definition of a pressure injury.	Yes = 83% No = 17% 354 votes	Consensus achieved
I prefer “medical device” Or “medical or other device”	7% 93% 335 votes	Consensus achieved
Stage 1 pressure injury		
Remove the statement “Purple or maroon discoloration of the localized area that is non-blanchable may indicate deep tissue pressure injury” from the description of Stage 1 pressure injury.	Yes = 44% No = 56% 339 votes	Consensus not achieved
Remove the statement “Color changes do not include purple or maroon discoloration, these may indicate deep tissue pressure injury”.	Yes = 14% No = 86% 337 votes	Consensus achieved
Stage 2 pressure injury		
The wound bed is viable pink or red, moist, and may also present as an intact or ruptured serum-filled blister.	Yes = 97% No = 3% 351 votes	Consensus achieved
Retain skin conditions that may be incorrectly identified as a Stage 2 pressure injury.	Yes = 92% No = 8% 350 votes	Consensus achieved
Stage 3 pressure injury		
Retain the term “epibole” in the definition of Stage 3.	Yes = 80% No = 20% 345 votes	Consensus achieved
Include the sentence describing anatomical locations: “The bridge of the nose, ear auricle, and occiput, and malleolus do not have subcutaneous adipose/fat tissue and Stage 3 pressure injuries do not occur in these areas.”	Yes = 75% No = 25% 289 votes	Consensus not achieved
Stage 4 pressure injury		
Remove the term <i>osteomyelitis</i> from the definition of Stage 4.	Yes = 80% No = 20% 335 votes	Consensus to remove the phrase was achieved
Remove the statement “If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury” from Stage 4.	Yes = 20% No = 80% 341 votes	Consensus achieved
Unstageable pressure injury		
Change “depth” to “extent” in unstageable.	Yes = 96% No = 4% 321 votes	Consensus achieved
<i>Stable eschar (ie, dry, adherent, intact without erythema or fluctuance) on the heel or ischemic limb should not be softened or removed.</i>	Yes = 81% No = 19% 296 votes	Consensus achieved
Deep tissue pressure injury		
Add the phrase in italic to the definition: Wounds may evolve rapidly to reveal the actual extent of tissue injury, <i>or may resolve without tissue loss.</i>	Yes = 86% No = 14% 346 votes	Consensus achieved

(continues)

TABLE 1.
Summary of Consensus Statements and Outcomes (Continued)

Consensus Statement	Vote	Outcome
Place the definition of DTPI between Stage 1 and Stage 2.	Yes = 16% No = 84% 353 votes	Consensus achieved
Add: "Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions".	Yes = 85% No = 15% 319 votes	Consensus achieved
Mucosal membrane pressure injury		
Add the statement "The staging system for pressure injury of the skin cannot be used to stage mucosal membrane pressure injury." to the definition of mucosal membrane pressure injury.	Yes = 98% No = 2% 325 votes	Consensus achieved

Abbreviation: DTPI, deep tissue pressure injury.

further explain and differentiate pressure injuries from other wounds or injuries.

Literature Review and Preliminary Revisions

In January 2015, the NPUAP Board of Directors (BOD) approved a review of the staging system. A task force was appointed to examine the current system and to review literature relevant to staging. The work of the task force resulted in a revision of the staging definitions and artwork to clarify and refine the staging system. This work also led to development of new nomenclature relevant to pressure-related soft tissue injury. The Task Force comprised Drs Laura Edsberg and Joyce Black as cochairs; Margaret Goldberg, Laurie McNichol, Lynn Moore, and Mary Sieggreen served as task force members. Task Force members have expertise, education, and credentials in the areas of nursing practice, nursing education, dietetics (nutrition), and engineering.

The interdisciplinary Task Force worked with a university-based, professional reference librarian to generate a list of search terms that identified literature related to staging pressure injuries. Multiple search terms and combinations of terms were employed. An extensive literature review was conducted to summarize the state of the science in the area of pressure injury staging, pathology, and etiology. Following the initial searches, additional terms were added based on key words identified within the references. References were limited to those published in English. They included clinical practice guidelines, randomized controlled trials, nonrandomized studies, case studies, multiple case series, in vitro studies, and in vivo (animal) studies. National and international conference findings and government Web site information were also included. There was no publication year limit and all ages of individuals from premature infants through geriatrics were included. The CINAHL and MEDLINE electronic databases were searched individually; this search yielded 3652 articles. Task Force members completed title and abstract reviews, along with full text review. Two hundred forty-two articles were deemed relevant to the task at hand. In addition, references submitted by stakeholders and the public during the comment period were retrieved and reviewed for relevance to the goals of the Task Force. This multistage literature searches revealed a dearth of literature focused on pressure injury staging definitions, supporting the need for the review.

During weekly meetings held between January 2015 and April 2016, the Task Force drafted definitions and descriptions based on new scientific findings, with the intention to clarify issues with current nomenclature. These issues are reflected in comments and questions received by the NPUAP. While regulatory compliance, documentation, and legal issues were considered, the proposed changes were based on science and expert opinion. Proposed definitions were revised based on feedback from the NPUAP BOD and expert Panel members during a panel meeting in August 2015. They were made available for feedback and comment from stakeholder organizations and individuals. More than 1800 comments were received and reviewed. Following the comment period, the definitions were again revised based on the feedback received; these revised definitions were reviewed by the full NPUAP Panel and approved by its BOD. The NPUAP has historically held a consensus conference to invite discussion of draft staging definitions. As in 1989 and 2007, the consensus conference model was used to present the 2016 draft definitions and facilitate discussion of those parts of the definitions that needed clarification or revision, based on stakeholder and public comments; it was held April 2016.

Artwork was created to illustrate the features of each stage of pressure injuries. The artwork is a graphic representation of the tissues present and is to be used for teaching about the extent of injury and the tissues present or absent within each stage of a pressure injury. The artwork was developed in parallel with the staging revisions and was subject to multiple revisions. The NPUAP BOD approved the final artwork prior to the Consensus Conference.

INITIAL REVISIONS TO STAGING SYSTEM

Ulcer Versus Injury

The 2016 NPUAP Pressure Injury Staging System uses the term injury instead of ulcer. The decision to change the term ulcer to the term injury was based on months of discussion, vigorous debate, comments received from stakeholders and individuals, and the intensive literature review described previously. As a result, it was determined that the term *ulcer* does not accurately describe the physical presentation of a Stage 1 Pressure Injury or a Deep Tissue Pressure Injury

BOX 2.

Stage 1 Pressure Injury

Definition

Intact skin with a localized area of nonblanchable erythema, which 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 may indicate DTPI. (Figure 2a illustrates Stage 1 pressure injury in lightly pigmented skin and Figure 2b illustrates Stage 1 pressure injury in darkly pigmented skin. Figure 3a illustrates blanchable erythema and Figure 3b depicts nonblanchable erythema. Figure 4 illustrates a Stage 1 pressure injury with edema.)

Teaching Points

- Stage 1 pressure injuries are often the first visible change in the skin and have been historically referred to as “heralding sign.”
- It is important that scar tissue and DTPI not be classified as a Stage 1 pressure injury.
- The skin’s blanché response can be assessed by pressing the skin with a finger to close the capillary bed. Upon release of pressure, the skin should immediately return to the native skin color. Diascopy, examination of the skin’s blanché response through a clear disc pressed on the skin, also may be used to assess the cutaneous blanché response.

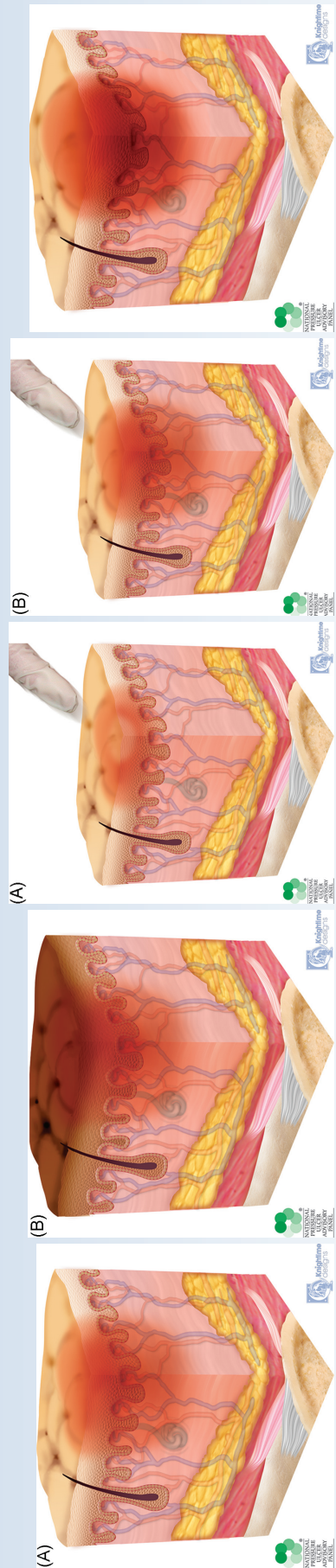


Figure 2a. Stage 1 pressure injury and lightly pigmented skin. **Figure 2b.** Stage 1 press in and darkly pigmented skin. **Figure 3a.** Blanchable erythema. **Figure 3b.** Non blanchable erythema. **Figure 4.** Stage 1 pressure injury with edema.

Consensus Conference Discussion and Comments From Stakeholders

In revising the definition of a Stage 1 Pressure Injury, substantial discussion focused on difficulties in identifying these wounds in darkly pigmented skin and the challenges associated with determining Stage 1 pressure injury versus DTPI. Although histological evidence suggests that Stage 1 pressure injuries have tissue damage extending below the epidermis, Stage 1 pressure injuries are staged using the visible assessment of the skin only.^{4,6} Themes of the stakeholder and public comments received for the Stage 1 pressure injury definition included whether the definition of a DTPI should be included in the definition of a Stage 1 pressure injury and whether more details on assessment in general and in darkly pigmented skin specifically should be included. Some participants also commented on the use of erythema versus redness when describing a Stage 1 Pressure injury. In order to clarify the appearance of skin in Stage 1 pressure injuries, the use of colors and descriptors was discussed and voted on. Consensus was not reached when voting on removing the statement, “Purple or maroon discoloration of the localized area that is non-blanchable may indicate deep tissue pressure injury”; subsequent discussion centered on the importance of differential diagnosis, the subjective nature of color analysis, and distinctions between blanchable and nonblanchable erythema. A revised statement, “Color changes do not include purple or maroon discoloration, these may indicate deep tissue pressure injury,” was put forward based on this discussion; it achieved consensus (Box 3).

BOX 3.**Stage 2 Pressure Injury: Partial-Thickness Skin Loss With Exposed Dermis****Definition**

Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissue is not visible. Granulation tissue, slough and eschar, are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. (Figure 5 illustrates a Stage 2 pressure injury.)

Teaching Points

- This stage should not be used to describe moisture-associated skin damage (MASD) including incontinence-associated dermatitis (IAD) or intertriginous dermatitis (ITD).
- This stage should not be used to describe MARSIs or traumatic wounds (skin tears, burns, abrasions).
- It is especially important if an injury is suspected of being a stage 2 pressure injury that the presence or history of pressure and/or shear be confirmed.
- Stage 2 pressure injuries heal via reepithelialization and not by granulation tissue formation. A viable dermis is shiny; small blood vessels will be evident when the reticular dermis is visible. At times the superficial fascia under the dermis is visible and evident as a thin, ivory colored nonremovable layer.
- A viable dermis is pink or red, shiny, and blanchable. It is not granular.

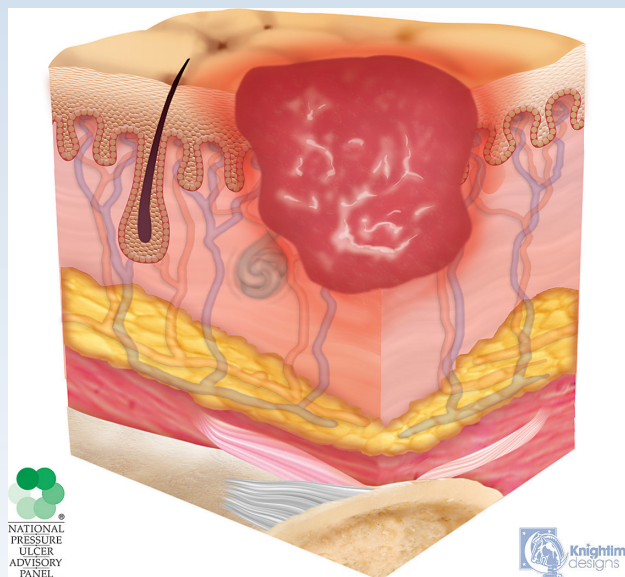


Figure 5. Stage 2 pressure injury.

Consensus Conference Discussion and Comments From Stakeholders

Questions regarding Stage 2 pressure injuries are among the most frequent questions the NPUAP receives. The difficulty associated with differentiating a Stage 2 pressure injury from MASD was a focus of the Task Force as the definition was revised. Since 2007 there has been significant research published regarding MASD.¹¹⁻¹³

Themes of the stakeholder and public comments received included removal of the term “viable” from the definition and the addition of more conditions that are not Stage 2, including mucosal pressure injuries, surgical wounds, and friction injuries. Many supported the addition of MASD, IAD, ITD, and MARSIs as being different from a Stage 2 into the definition.

There was strong support from the conference attendees to retain skin conditions, which may be misidentified as Stage 2 pressure injuries within the definition. Initial voting to remove the term viable did not reach consensus and the discussion that followed included many topics including how nonviable dermis would appear and the need to assist the bedside nurse by using the term viable. After extensive feedback from attendees, the question was called again and again did not reach consensus. The discussion following the second vote included a broader range of topics including possible confusion between blistering DTPI versus Stage 2 and the potential value of viable to help clarify distinguishing features and the potential benefit of the term for the bedside clinician. The statement was revised to “The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister,” and consensus was achieved during a third vote by repositioning the location of the term viable within the definition (Box 4).

(DTPI). Furthermore, histopathological work indicates that small changes in pressure-related injuries start in the tissue prior to the changes being visible on physical examination.⁴⁻⁶ An ulcer cannot be present without an injury, but an injury can be present without an ulcer. An ulcer is defined as a break in skin or mucous membrane with loss of surface tissue, disintegration and necrosis of epithelial tissue, and often, purulent exudate.⁷ Langley and Brenner⁸ define an injury as bodily damage caused by transfer of energy and also the absence of energy. Examples of injuries caused by absence of energy are hypothermia and asphyxia. Examples of injuries

caused by exposure to low energy are pressure injuries and carpal tunnel syndrome; these injuries occur without a sudden discernable effect.

The science regarding the etiology of pressure injuries has supported the role of tissue deformation, microclimate, nutrition, perfusion, and tissue tolerance.⁹ The pressure injury definition was revised in order to incorporate what is now understood regarding the etiology of these injuries.

Comments received from stakeholder organizations and individuals expressed overwhelming support in favor of the terminology change from ulcer to injury. The NPUAP BOD

BOX 4.**Stage 3 Pressure Injury: Full-Thickness Skin Loss****Definition**

Full-thickness skin loss, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges), is often present. Slough and/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, or bone is not exposed. If slough or eschar obscures the extent of tissue loss, this is an unstageable pressure injury. (Figure 6 depicts a Stage 3 pressure injury, and Figure 7 illustrates a Stage 3 pressure injury with epibole.)

Teaching Points

- Anatomic differences in body areas, such as the buttocks versus the sacrum, can result in very different depths of injury. Accurate staging is based on assessment of the extent of damage, and visible tissue layer.
- For many years, slough was considered a nonviable tissue. However, research on biofilm has improved our understanding of the role of inflammation in chronic wounds. Slough is now recognized as an inflammatory exudate composed of proteinaceous tissue, fibrin, neutrophils, and bacteria, rather than nonviable tissue. The inflammatory exudate is often produced in response to biofilm. If the biofilm is not controlled, the slough will recur following debridement. Slough is usually light yellow/cream colored and moist and soft. Eschar is a black or brown dry, thick, and leathery.
- Full-thickness skin loss, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges), is often present. Slough and/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, or bone is not exposed. If slough or eschar obscures the extent of tissue loss, this is an unstageable pressure injury.

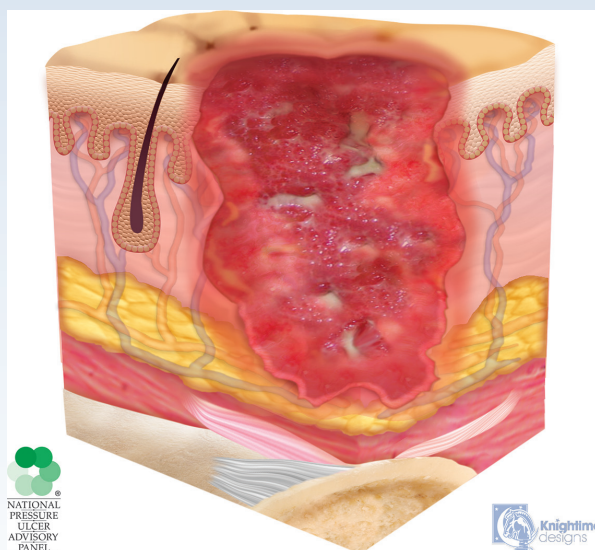


Figure 6. Stage 3 pressure injury.

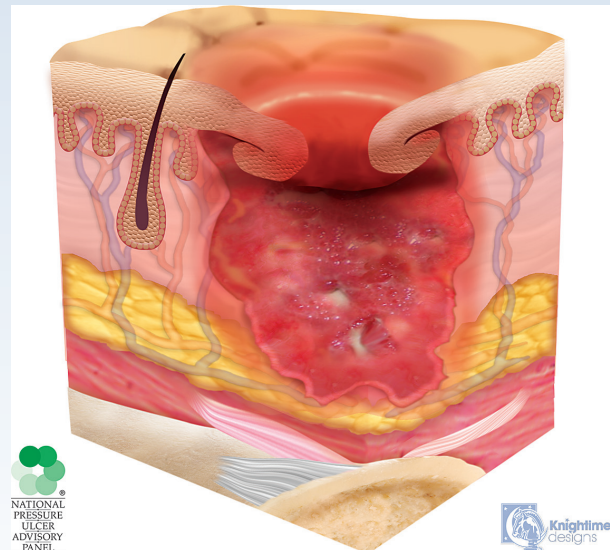


Figure 7. Stage 3 pressure injury with epibole.

Consensus Conference Discussion and Comments From Stakeholders

Stage 3 pressure injury has not been a significant focus of recent literature and the NPUAP Board received relatively few questions related to this stage. Consensus conference attendees voted to retain the term “epibole” in the definition of Stage 3 rather than using just “rolled” edge to describe. Consensus was not reached on a statement that Stage 3 pressure injuries do not occur in areas that do not have subcutaneous (adipose) tissue. Comments during the subsequent discussion focused on consideration of the anatomy of the heel and ear and what draping subcutaneous tissue over the malleolus looks like in the bariatric population. Nevertheless, consensus was not reached after 3 rounds of voting and the statement was ultimately discarded (Box 5).

voted to change the term prior to the consensus conference based on the current science and support from the comments received. The term ulcer is used within the definition of those stages of pressure injuries that present as ulcers.

Roman Versus Arabic Numerals

Roman numerals were changed to Arabic numerals in the names of the different stages. This change was made to clarify and reduce the potential for confusion between similar terms used in health care such as a Stage IV and intravenous (IV).

Consensus Conference

The NPUAP hosted an interdisciplinary conference April 8 to 9, 2016, in Chicago, Illinois. Consensus statements were

developed by the Task Force to further revise the definitions for pressure injury and the pressure injury stages, based on the most frequent comments and questions received during the comment period. All conference attendees were able to discuss and vote on each consensus statement. Approximately 400 individuals attended the conference. The interdisciplinary audience included nurses, physicians, physical therapists, dieticians, and researchers. Representatives of many national and international wound organizations participated. Mikel Gray, a Professor from the School of Medicine and School of Nursing at the University of Virginia, was invited by the NPUAP to serve as the consensus conference moderator. Dr Gray has expertise in moderating consensus conferences and is knowledgeable about, although not directly vested in, the issue of pressure injury staging.

BOX 5.**Stage 4 Pressure Injury: Full-Thickness Skin and Tissue Loss****Definition**

Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage, or bone in the ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining, and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss, this is an unstageable pressure injury. (Figure 8 illustrates a Stage 4 pressure injury.)

Teaching Points Stage 4 Pressure Injury

- Clinicians should assess for osteomyelitis that may be present in Stage 4 pressure injuries.

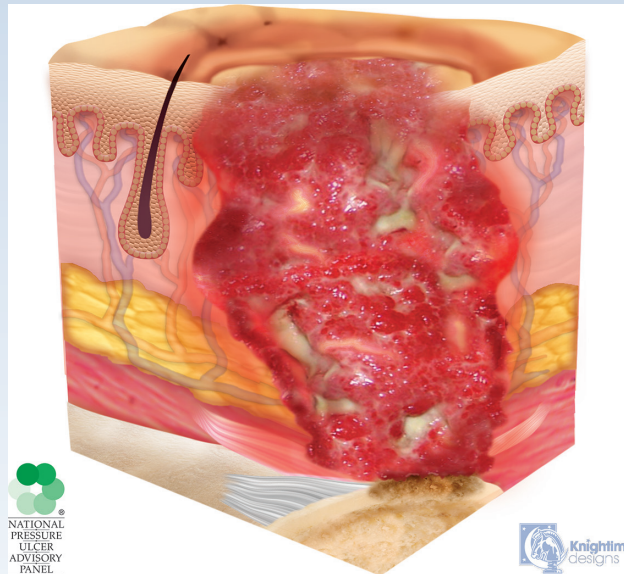


Figure 8. Stage 4 pressure injury.

Consensus Conference Discussion and Comments From Stakeholders

As with Stage 3 Pressure Injury, Stage 4 pressure injury has not been a significant focus of recent literature and few questions or comments related to this stage were received by the NPUAP. The majority of stakeholder and public comments received concerning the proposed definition of Stage 4 Pressure Injury were favorable. The major themes of the comments received were related to the inclusion of the word "osteomyelitis" in the definition and the reference to unstageable pressure injury.

The initial vote to include osteomyelitis in the definition of a Stage 4 did not reach consensus; multiple participants argued that osteomyelitis occurs with many full-thickness pressure injuries and inclusion of the term would help raise awareness of this possibility. Other attendees suggested omitting the term to avoid the use of antibiotics without a definitive diagnosis; they also commented on the importance of diagnosis using bone biopsy versus radiography. Participants also argued that osteomyelitis is a complication and does not belong in the definition; if this term is included they opined, why not include cellulitis or infected joint space. Following this discussion, consensus was reached to remove the term *osteomyelitis* from the definition of a Stage 4 pressure injury.

There has been much discussion regarding Stages 3, 4, and unstageable pressure injuries in the years since the last revision of the definitions. Pressure injury wound beds that have the extent of tissue loss obscured by slough or eschar are unstageable, but when the extent of the injury is revealed, it will be a Stage 3 or 4 pressure injury. The attendees voted to keep the statement, "If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury" in the definition of Stage 4 pressure injury (Box 6).

Consensus Process

Each audience member was given a handheld audience response system device. At the start of the conference, the system was calibrated. All results from the conference reflect the positive or negative audience responses. A review of each proposed definition with rationale was presented by one of the Task Force members. The moderator then presented the consensus statements for discussion and a vote. Consensus was reached when 80% or more indicated agreement or disagreement with a particular statement. If the vote on a statement did not reach consensus, all attendees were invited to participate in a discussion moderated by Dr Gray. If needed, 2 additional votes were taken to try to reach consensus, either positively or negatively. If consensus was not reached after 3 votes, the original

definition remained unchanged. Table 1 summarizes the statements that were voted on at the conference.

Revised NPUAP Pressure Injury Staging System

Below is a summary of the moderated and detailed discussions that occurred during the NPUAP consensus conference. The following sections summarize statements voted on at the consensus conference, key points raised during discussion, and important teaching points associated with each of the pressure injury stages. In addition, artwork for each stage is shown, as well as the final definition for each stage. Figures 1a and 1b illustrate lightly and darkly pigmented healthy skin; they provide a foundation for the additional artwork used to illustrate each of the pressure injury stages (Box 1).

BOX 6.**Unstageable Full-Thickness Pressure Injury: Obscured Full-Thickness Skin and Tissue Loss****Definition**

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. Stable eschar (ie, dry, adherent, intact without erythema or fluctuance) on ischemic limb or heels should not be softened or removed. (Figure 9 illustrates an unstageable pressure injury; Figure 10 depicts an unstageable pressure injury with a particular focus on slough.)

Teaching Points

- When teaching others about unstageable pressure injury, clarify that this stage is unstageable due to inability to visualize the wound base rather than the clinician's inability to determine the injury stage.
- Describe the role of eschar as the body's natural (biological) cover. Removing stable eschar in the poorly perfused area results in an open wound that may expose the limb to infection and tax the ability to heal.
- Treat the stable eschar as dry gangrene; do not moisten or soften it. The most important intervention when managing unstable pressure injury is pressure redistribution rather than eschar removal. As eschar loosens from the wound bed, trim the edges to avoid inadvertent removal.

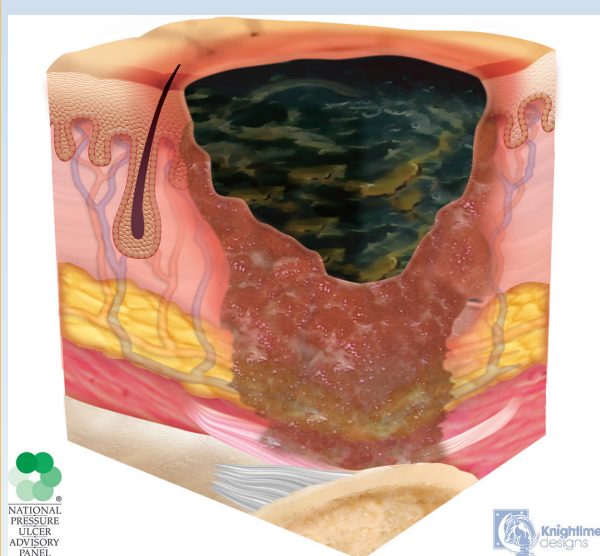


Figure 9. Unstageable pressure injury.

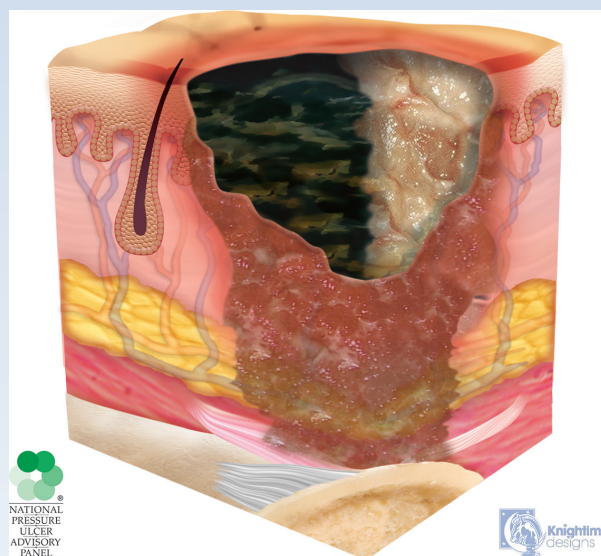


Figure 10. Unstageable pressure injury with a particular focus on slough.

Consensus Conference Discussion and Comments From Stakeholders

The majority of stakeholder and public comments received agreed with the proposed definition. Multiple stakeholders and individuals asked to what extent of the wound bed must be obscured to make a pressure injury unstageable. The NPUAP asserts that it is not possible to identify a specific certain percentage of concealed wound bed needed to deem a pressure injury unstageable pressure injury. Any amount of slough or eschar obscuring the wound bed has the potential to prevent the examiner from determining if deeper tissues (eg, bone, joint space) are exposed at the bottom of the wound. Multiple stakeholders queried whether the phrase "the body's natural (biological) cover" should be removed or retained in the revised definition.

The use of the term "depth" rather than "extent" led to many of the questions and comments. A specific linear depth is not correlated with the stage of pressure injury; instead, it is the extent of the tissue damage present that is necessary to stage a pressure injury correctly. Following thorough discussion, conference attendees voted to change "depth" to "extent" in the definition of an unstageable pressure injury.

The previous definition of an unstageable pressure injury described eschar on the heels as "the body's natural (biological) cover," but attendees did not reach consensus on including this phrase in the revised definition. Participants who favored leaving this phrase out of the revised definition argued that the description is a teaching or treatment point that does not belong in the definition of unstageable pressure injury. Some stated that general surgeons will remove the eschar and some mentioned this varies in other types of injuries, which are not relevant to pressure injury staging. After a lively discussion and attempts at revision, the statement was again voted upon and again did not reach consensus. Discussion continued and expanded to include the issues associated with removal of stable eschar, which could result in serious complications and even loss of limb. The inclusion of ischemic limbs and heel eschars were both discussed and the challenges associated with the use of softening dressings were presented. The inclusion of ischemic limb and in the statement along with the importance of not softening or removing the eschar allowed the group to reach consensus.

Lively discussion surrounding slough and biofilm, as well as the anatomy of the heel, also occurred. The effect of chronic inflammation in perpetuating a nonhealing wound and its appearance continued to be a focus of the comments; medical, legal, and regulatory issues were mentioned. Reimbursement issues related to the term unstageable were raised. Further discussion centered on eschar and slough in a wound bed indicating a full-thickness wound (Stage 3 or Stage 4 pressure injury). Discussion of recent published data intended to enhance our understanding of "what lies beneath" eschar on the heels brought up the question of "Could some ulcers be only partial thickness and still have eschar?"¹⁴ Participants discussed whether the wound bed of certain unstageable wounds was finally revealed the wound may have healed under the eschar. Consensus on the item did not pass and the sentence will remain in the definition (Box 7).

BOX 7.**Deep Tissue Pressure Injury: Persistent Nonblanchable Deep Red, Maroon or Purple Discoloration****Definition**

Intact or nonintact skin with localized area of persistent nonblanchable deep red, maroon, 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 and/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 (unstageable, Stage 3, or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions. (Figure 11 depicts a DTPI.)

Teaching Points

- Confirm purple skin (appearing as ecchymoses or bruising) due to pressure or shear and not a response to medication or trauma.
- Attempt to identify the timing and setting of the pressure/shear that lead to DTPI for root cause analysis.
- Document the evolution of the DTPI following discovery (eg, sloughing of epidermis to reveal deeper tissue damage and ultimately, if injury becomes full thickness, the stage of the resultant injury).

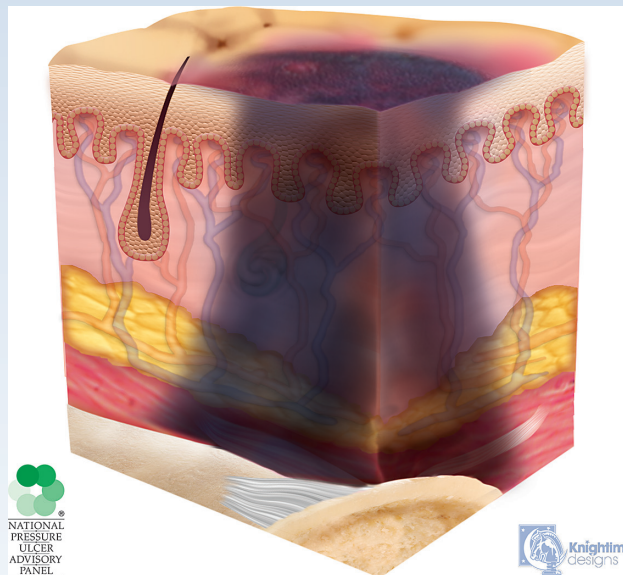


Figure 11. Deep tissue pressure injury.

Consensus Conference Discussion and Comments From Stakeholders

Stakeholder and public comments focused on whether to include differential diagnoses such as traumatic, ischemic, or dermatologic conditions within the definition of DTPI. Multiple stakeholders, public commenters, and consensus conference participants acknowledged that the original definition was written over 10 years ago when little was known about this phenomenon. Today we know more and are able to diagnose DTPI with greater accuracy. Extensive discussion also focused on the term “suspected.” Multiple commenters noted that retention of the term might suggest a linearity of the staging system. If DTPI resolved and the definition did not include “suspected,” was the injury staged incorrectly? Other participants queried whether a patient could have a suspected pressure injury or a suspected Stage 2 pressure injury. They observed that multiple conditions might lead to purple skin, including some that might rapidly evolve into full-thickness soft tissue loss. Examples included traumatic injuries such as hematoma, ischemic injuries from vasopressor medications, and necrosis associated with administration of warfarin. Considered collectively, these considerations led to widespread support to delete “suspected” from the revised definition of DTPI in order to clarify practice; this deletion reached consensus.

Discussion also focused on placement of the definition of DTPI between Stage 1 and Stage 2. This proposal did not reach consensus. The rationale for this lack of consensus included concerns regarding the progression of DTPI through predictable stages, and the number of DTPIs that resolve and thus do not become full-thickness tissue injuries.

A proposal was made at the Consensus Conference to add a statement to the revised definition of DTPI similar to the one included in the definition of a Stage 2 pressure injury. The proposed statement read, “Do not use this stage (DTPI) for ischemic, traumatic, or dermatologic conditions.” However, consensus was not reached and this phrase was not added to the revised definition (Box 8).

Validation of Staging System

After achieving consensus on the revised Staging System, photographs of various wounds were shown to the participants along with a focused patient history and physical examination findings. The audience voted on the appropriate stage represented by the photo. The results were used to determine which of the photographs provided a clear representation of the stage, and which did not; results are summarized in Table 2.

The nonpressure injuries were most frequently scored correctly (92%-97%). The ulcers that were due to medical devices were scored most incorrectly, with respondents choosing both the stage of the injury and the label Medical Device–Related Pressure Injury. It became clear that the etiology of the injury, medical device–related, was chosen instead of the stage of the injury. To address this issue, the phrase medical or device related was defined clearly as an etiology and

BOX 8.**Medical Device–Related Pressure Injury****Definition**

Medical device–related pressure injuries result from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant pressure injury generally conforms to the pattern or shape of the device. The injury should be staged using the staging system.

Teaching Points

- The correct diagnostic label is the stage, for example, “Stage 4 pressure injury” on bridge of nose from a medical device.
- We strongly suggested that the actual item be included in the record to allow for root cause and common cause analysis.
- *Examining the skin underneath a medical device.* Some medical devices, such as stockings or oxygen tubing, can be easily removed to examine the skin. Other devices such as tracheotomy ties will require 2 people if the patient is agitated and likely to grab at the device or remove it. In those instances, examining the skin during the hand-off is suggested.
- *Protecting the skin under a medical device from pressure injury.* Some studies suggest that pressure reductions beneath medical devices occur when thin dressings are applied between the device and the skin.¹⁵⁻¹⁷ These dressings should become part of the workflow process because it can be difficult to lift the device later to apply the dressing such as the case of a continuous positive airway pressure (CPAP masks). Other examples include the use of a hydrocolloid applied to the nasal bridge under a noninvasive ventilator face mask or the use of a wide silicone foam dressing beneath tracheostomy ties (Box 9).

BOX 9.**Mucosal Membrane Pressure Injury****Definition**

Mucosal membrane pressure injuries are found on mucous membranes with a history of a medical device in use at the location of the injury. Mucosal tissues are especially vulnerable to pressure from medical devices such as oxygen tubing, endotracheal tubes, bite blocks, orogastric and nasogastric tubes, urinary catheters, and fecal containment devices. (Figure 12 illustrates the anatomy of a mucous membrane.)

Teaching Points

- Because the staging system for cutaneous pressure injuries is based on the anatomy skin, it cannot be used to stage mucosal pressure injury. Nonblanchable erythema cannot be seen in mucous membranes; shallow open ulcers indicating superficial tissue loss of the nonkeratinized epithelium are so shallow that the naked eye cannot distinguish them from deeper, full-thickness ulcers.
- Rather than applying the staging system for cutaneous pressure injuries, the clinician should label a pressure injury on the lower lip as a “mucosal membrane pressure injury” on the lower lip from a medical device (ET tube). We suggest documenting the name of the actual item to allow for root cause and common cause analysis.
- The appearance of injured mucosal membrane is often inflamed and may be tender and edematous. A soft coagulum forms that may remain loosely attached, but this is not slough.
- The healing of wounds on mucosal membranes typically does not result in a scar since the scar tissue is remodeled. Fibroblasts in the oral mucosa phenotypically are different from those in the skin and more closely resemble fetal fibroblasts.
- Some medical devices on mucous membranes, such as indwelling urinary catheters, can be easily moved to examine the tissue when the patient is being turned in bed. Other devices such as endotracheal tubes may require assistance from a respiratory therapist to move the tube especially if the patient is agitated and likely to grab at the device or remove it. In those instances, examining the skin during the hand-off is suggested. Examining the lips, tongue, and mouth during oral care is important.
- *How to protect the mucous membrane beneath a medical device from pressure injury.* The medical device should be positioned to reduce pressure on mucous membranes. Using stabilizing systems to hold indwelling urinary catheters or nasogastric tubes in one place without pressure can protect the tissues.

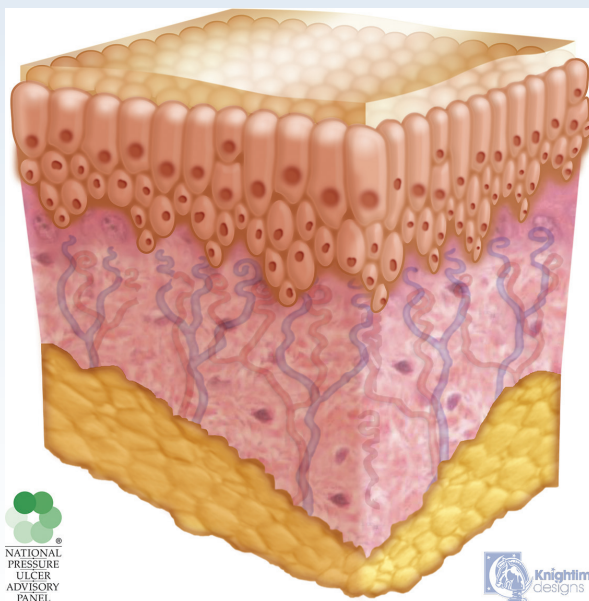


Figure 12. Anatomy of a mucous membrane.

TABLE 2.
Validation of Revised Staging System

Stage of Injury	Total Number of Responses	Stage 1 ^a	Stage 2 ^a	Stage 3 ^a	Stage 4 ^a	DTPI ^a	Unstageable PI ^a	MDRPI ^a	MMPI ^a	Not a PI ^a
4	314	0	0	0	94% ^a	0	3%	0	0	3%
4	290	0	19	2	56% ^a	0	0	0	0	21%
9	312	>1%	1%	0	0	0	>1%	>1%	0	95% ^a
5	307	>1%	>1%	>1%	0	97% ^a	>1%	0	0	>1%
9	306	0	0	0	0	0	0	5%	>1%	92% ^a
4	316	0	0	3%	86% ^a	0	6%	2%	0%	0%
2	304	0	70% ^a	22%	0	0	0	0	0	4%
3	314	0	8%	88% ^a	>1%	0	1%	>1%	0	>1%
9	309	1%	0	0	0	>1%	0	0	>1%	97% ^a
1	311	97% ^a	0	0	0	2%	0	0	0	0
9	310	0	0	0	0	>1%	0	0	0	99% ^a
6/7	303	0	>1%	>1%	>1%	>1%	33% ^a	62% ^a	0	2%
9	302	0	0	0	0	2%	0	0	0	97% ^a
2	298	4%	72% ^a	>1%	0	>1%	0	0	1%	21%
9	309	0	0	0	0	>1%	>1%	0	0	98% ^a
5	303	0	4%	11%	2%	79% ^a	1%	0	0	>1%
2/7	293	2%	42% ^a	0	0	1%	0	46% ^a	0	8%
9	299	>1%	0	0	>1%	0	3%	0	0	95%
6/7	292	>1%	0	0	0	>1%	22% ^a	73% ^a	0	2%
7/8	275	0	2%	1%	0	0	0	53% ^a	42% ^a	0%
1/7	287	79%	2%	0	0	3%	0	5%	0	9%
7/8	284	0	0	0	0	0	1%	19% ^a	77% ^a	2%
5	296	0	0	0	0	97% ^a	.1%	0	0	>1%
9	272	>1%	41%	2%	0	4%	0	5%	0	45% ^a
6	287	0	1%	5%	0	0	90% ^a	0	0	1%
9	278	1%	0	0	0	1%	0	0	0	96% ^a
9	284	0	0	0	0	0	>1%	0	0	99% ^a
4	277	0	0	0	91% ^a	1%	>1%	0	0	6%
2	272	4%	90% ^a	1%	0	0	0	>1%	0	2%
2	279	0	19% ^a	61%	17%	0	0	0	0	>1%
4	276	0	0	2%	86% ^a	0	3%	1%	0	6%
5	272	0	0	0	0	93% ^a	6%	0	0	0

Abbreviations: DTPI, deep tissue pressure injury; MDRPI = medical device-related pressure injury; MMPI, mucous membrane pressure injury; PI, pressure injury; Stage 1, Stage 1 pressure injury; Stage 2, Stage 1 pressure injury; Stage 3, Stage 1 pressure injury; Stage 4, Stage 1 pressure injury.

^aAll responses are presented as a proportion of total.

not a pressure injury stage during this conference. The revised medical device-related pressure injury definition now includes the directive that the injury should be staged using the staging system. Other areas of incorrect responses were deep Stage 2 ulcers with viable dermis or exposed fascia with visible capillary buds, reulcerated scar in a patient with a history of a Stage 4 ulcer in the area and chronic friction injury. Teaching points will be included in NPUAP materials to address these aspects.

CONCLUSIONS

The NPUAP Pressure Ulcer Staging System was refined, beginning with the change in terminology from pressure injury to pressure injury in order to include soft tissue injury without ulceration (Stage 1 and DTPI). Advances in the scientific understanding of how pressure injuries occur, from intense and/or prolonged pressure, were reflected in the new definition and resulted in the inclusion of medical and nonmedical devices as one of the etiologies. Arabic numbers were also incorporated to

reduce confusion. Nevertheless, while the various pressure injury stages are assigned numbers, and numbers imply progression, the deterioration of a pressure injury does not predictably follow a linear evolution from Stage 1 to Stage 4. Until more clinical evidence is available, especially about the impact of pressure on levels of soft tissue and the tolerance of soft tissue for pressure and shear, clinicians cannot steadfastly state, for example, that a stage 3 had its beginnings as a stage 1 or that a stage 1 will inevitably evolve into a stage 4. Consensus was used to further clarify aspects of each of the definitions. Finally, each stage of pressure injury was validated using photographs and the new staging definitions. The revisions of the NPUAP Pressure Injury Staging System are intended to improve accuracy of pressure injury staging. The teaching points and artwork will provide clarity and added resources for clinicians.

GLOSSARY

Biofilm: Complex microbial communities containing bacteria and fungi. The microorganisms synthesize and secrete a protective matrix that attaches the biofilm firmly to a living or nonliving surface.

Blanchable: Quickly regains redness when pressure is lifted from skin (2-3 seconds)

Erythema: Redness of the skin or mucous membranes, caused by hyperemia (increased blood flow) in superficial capillaries

Eschar: Dead tissue appearing black or brown dry, thick, and leathery

Fascia: Band or sheet of connective tissue, primarily collagen, beneath the skin that attaches, stabilizes, encloses, and surrounds and separates muscles and internal organs.

IAD: incontinence-associated dermatitis

ITD: intertriginous dermatitis

MARSI: medical-adhesive-related skin injuries

MASD: moisture-associated skin damage

Microclimate: temperature, humidity, and airflow at patient/support surface

Re-epithelialization: Restoration of epithelium over a wound

Slough: Inflammatory exudate composed of proteinaceous tissue, fibrin, neutrophils, and bacteria, rather than nonviable tissue. Slough is usually light yellow/cream colored and moist and soft.

Viable dermis: Living dermal tissue

Vasopressive medication: Cause vasoconstriction (contraction of smooth muscle in blood vessels) and increase in blood pressure. They are used to treat hypotension, especially in critically ill patients.

ACKNOWLEDGMENTS

We thank Andrea Sullivan, MLS, for her expertise and guidance in searching the literature. The conference support was provided by the National Pressure Ulcer Advisory Panel.

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