



Pressure Injury Assessment, Prevention & Management

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Purpose

The purpose of this module is to provide the healthcare worker with the knowledge and skills to assess and manage all phases of pressure injury development and healing. A brief review of skin anatomy and pathophysiology and regulatory guidelines will be discussed as they pertain to pressure injuries.

Learning Objectives

After successful completion of this course, you will be able to:

1. Define basic pathophysiology of skin and pressure injury
2. Discuss the regulatory reimbursement guidelines
3. Assess pressure injuries and mode of injury
4. State five ways to prevent pressure injury
5. Discuss pressure injury treatment

Introduction

Pressure injury identification and management is overseen by the National Pressure Ulcer Advisory Panel (NPUAP) and the Wound, Ostomy and Continence Nurses Society (WOCN). These two organizations have recently redefined pressure injury management.

In 2016 NPUAP announced changes in the terminology and definitions for pressure ulcers. Pressure ulcers, bedsores, and decubitus ulcers are now defined as **Pressure injuries** (National Pressure Ulcer Advisory Panel (NPUAP), 2016 & 2016a).

The original belief was that to incur a “bedsore/decubitus ulcer” one had to be bedridden. However, healthcare workers now recognize that pressure injuries can occur whenever the patient constantly maintains any position. Additional factors such as incontinence, poor nutrition, and immobility can contribute to tissue injury (NPUAP, 2016 & 2016a).

Pressure injuries commonly occur over bony prominences where there is less tissue to compress:

- Sacrum
- Ischium
- Heel
- Trochanter
- Occiput
- Ears

(Wound, Ostomy, Continence Nurses Society (WOCN), 2016)

Definitions

Pressure injury is defined as an area of localized injury to the skin and/or underlying soft tissue that usually occurs over a bony prominence or is related to the use of a medical or other device, and is the result of pressure or pressure in combination of shear (NPUAP, European Pressure Ulcer Advisory Panel (EPUAP), and Pan Pacific Pressure Injury Alliance (PPPIA), 2014; NPUAP,

2016). 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, co-morbidities and the condition of the soft tissue. These types of injuries should be staged using a staging system (WOCN, 2016 pg. 143-4).

- Medical device pressure injury is defined as an injury resulting 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. These types of injuries should be staged using a staging system (WOCN, 2016).
- Mucosal membrane pressure injury is defined as an injury found on mucous membranes following the use of a medical device at the location of injury. These types of injuries cannot be staged using a staging system (WOCN, 2016).
- Present on Admission is any serious reportable event that is present at the time of admission or develop during an outpatient encounter (including emergency department, observation, or outpatient surgery) are classified as Present on Admission (POA) and is not considered a hospital acquired event.

Currently, the following hospitals are EXEMPT from the POA indicator requirement:

- Critical Access Hospitals (CAHs) and Long-Term Care Hospitals (LTCHs).
- Maryland Waiver Hospitals, Cancer Hospitals, and Children’s Inpatient Facilities.
- Rural Health Clinics and Federally Qualified Health Centers (FQHCs).
- Religious Non-Medical Health Care Institutions.
- Inpatient Psychiatric Hospitals, Inpatient Rehabilitation Facilities (IRFs), and Veterans Administration/Department of Defense Hospitals.

(CMS, 2014)

Prevalence, Incidence, Cost

Each year more than 2.5 million people sustain a pressure injury in the U.S. As the population ages, the prospect for more people sustaining a pressure injury will increase exponentially. Currently, the pressure injury incidence rate in hospitals is 2.5% and there are 60,000 deaths annually (Padula, 2017).

Pressure injuries are the second most common billing claim, resulting in an annual cost of 11 billion dollars (Padula, 2017; Boyko, Longaker, & Yang, 2018).

Did You Know?

One pressure injury could cost \$500-\$70,000 to treat, depending on the severity (Boyko, Longaker, & Yang, 2018).

Federal Implications

Healthy People 2020

Reducing the rate of pressure ulcer related hospitalizations among older adults is a national patient safety goal in the United States. It is a part of the Healthy People 2020 objectives for the Nation's health. (U.S. Department of Health and Human Services, 2015).

Regulatory Guidelines

The Center for Medicare and Medicaid (CMS) is working together with the National Quality Forum to improve hospital care and safety for the hospitalized patient (CSM, 2015). As a result pressure injuries are now reportable to state and federal agencies. The information is placed in databases that can be accessed by the public (Centers for Medicare & Medicaid Services [CMS], 2014).

Test Your Knowledge

Pressure injuries affect:

- A. 60,000 people
- B. 2.5% in the nation
- C. **2.5 million annually**
- D. 11 billion patients

Rationale: Each year more than 2.5 million people sustain a pressure injury in the U.S. As the population ages, the prospect for more people sustaining a pressure injury will increase exponentially. Currently, the pressure injury incidence rate in hospitals is 2.5% and there are 60,000 deaths annually (Padula, 2017).

Pressure injuries are the second most common billing claim, resulting in an annual cost of 11 billion dollars (Padula, 2017; Boyko, Longaker, & Yang, 2018).

Serious Reportable Events: AKA Never Events

The term "Never Event" was first introduced in 2001 by the National Quality Forum (NQF). In 2011 the term "Never Event" was changed to Serious Reportable Events (SRE). This list has expanded to 29 events grouped into seven categories: surgical, product or device, patient protection, care management, environmental, radiologic, and criminal (Agency for Healthcare Research and Quality [AHRQ], 2017).

Serious Reportable Events are defined as adverse events that are clearly identifiable and measurable, resulting in death or significant disability, and are usually preventable (AHRQ, 2019).

Examples include:

- Pressure injuries
- Wrong surgical site
- Central line associated blood stream infections

For a complete list of Serious Reportable Events follow this link:
<https://psnet.ahrq.gov/primers/primer/3>

Did You Know?

Stage III and Stage IV pressure injuries acquired while in a healthcare facility are reportable and not reimbursable at the MS-DRG rate (CMS, 2014).

The Medicare Severity - Diagnosis Related Groups (MS-DRGs) are payment groups designed for the Medicare population. Patients who have similar clinical characteristics and similar costs are assigned to a MS-DRG. The MS-DRG will be linked to a fixed payment amount based on the average cost of patients in the group (CMS, 2014).

The Centers for Medicare and Medicaid Challenge

The Centers for Medicare and Medicaid services challenge acute care hospitals to link quality and financial performance. This challenge has opened opportunities for healthcare facilities to reduce or even eliminate hospital-acquired pressure injury.

In 2016 CMS committed to establish, under the Affordable Care Act, a scoring methodology for hospitals related to a total hospital- acquired condition (HAC) score.

- Those hospitals scoring in the top performing quartile will receive a one percent payment reduction.
- Those hospitals scoring in the lowest performing quartile will receive a one percent payment penalty (CMS, 2014)

Test Your Knowledge

The Centers for Medicare and Medicaid Services challenges healthcare facilities to:

- A. Eliminate all serious reportable events by 2020
- B. Reduce Never Events
- C. **Link quality and financial performance**
- D. Pay a set amount for adverse occurrences

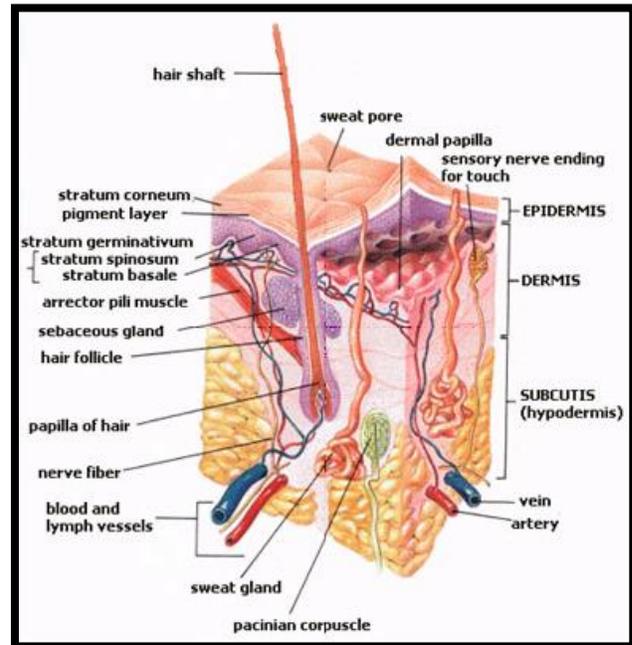
Rationale: The Centers for Medicare and Medicaid services challenge acute care hospitals to link quality and financial performance. This challenge has opened opportunities for healthcare facilities to reduce or even eliminate hospital-acquired pressure injury.

Skin Anatomy and Physiology Review

The skin forms an outer protective barrier, which contains many specialized cells and structures. The skin is also involved in maintaining optimal body temperature, gathers sensory information from the environment, and plays an active role in the body's immunity.

There are three distinct layers of the skin:

- Epidermis: Is the outer layer of skin, and consists of five layers, namely:
 1. Stratum basale
 2. Stratum spinosum
 3. Stratum granulosum
 4. Stratum lucidum
 5. Stratum corneum
- Dermis: Is the innermost layer and is composed of two layers, namely the papillary and reticular layers. The upper, papillary layer contains a thin arrangement of collagen fibers, and the lower, reticular layer, is thicker and made of thick collagen fibers that are arranged parallel to the surface of the skin. This layer contains specialized cells, including hair follicles, sebaceous (oil) glands (apocrine glands), sweat glands (eccrine glands) and blood vessels and nerves.
- Subcutaneous Tissue: Is a layer of fat and connective tissue that houses larger blood vessels and nerves. This layer is important in the regulation of temperature of the skin itself and the body. The size of this layer varies throughout the body and from person to person. (OpenStax. 2016).



Test Your Knowledge

The layer of skin that is important in the regulation of temperature is:

- A. Dermis
- B. Epidermis
- C. **Subcutaneous fat**
- D. Stratum corneum

Rationale: Subcutaneous Tissue: Is a layer of fat and connective tissue that houses larger blood vessels and nerves. This layer is important in the regulation of temperature of the skin itself and the body. The size of this layer varies throughout the body and from person to person.

The following sections are an abbreviated version of the WOCN Guidelines for Prevention and Management of Pressure Ulcers. To read the full version along with the evidence behind these guidelines, consult the WOCN website, <https://www.wocn.org>.

Pressure Injury Prevention and Management

The WOCN has published their Guideline for Prevention and Management of Pressure Ulcers (Injuries) as a practical guideline for healthcare workers (Wound, Ostomy, and Continence Society (WOCN), 2016).

The WOCN has identified three management goals:

- Identify individuals at risk for developing pressure injuries to initiate early prevention programs
- Implement appropriate strategies/plans to maintain skin integrity, prevent skin/tissue damage, and manage wounds according to the patient's condition/needs
 - Attain/maintain intact skin
 - Prevent complications
 - Promptly identify or manage complications
 - Optimize potential for wound healing
 - Involve patient/caregiver in self-management
- Implement cost-effective strategies/plans to prevent and treat pressure injuries (WOCN, 2016, pg. 10)

Identify Risk Factors

A risk assessment identifies the risk factors that a patient may have and minimizing those risk factors to reduce the risk of obtaining a pressure injury. A risk factor score is more than its sum, each component needs to be reviewed, documented, and the treatment plan should be based on the individual component.

Conducting a Risk Assessment

A risk assessment should be performed on admission with serial reassessments on a scheduled basis and when the patient's condition changes.

The WOCN suggests that the schedule for reassessment should be based on the acuity of the patient and when pressure injuries occur in the different clinical settings.

- Skilled Nursing Facilities
 - On admission and weekly thereafter
 - Pressure injuries usually develop within the first four weeks after admission
- Home Health Care
 - On initial assessment and on every visit thereafter
 - Pressure injuries usually develop within the first four weeks of being home
- Acute Care
 - On admission and every 24-48 hours thereafter
 - Pressure injuries usually develop within the first two weeks of hospitalization

- Intensive Care
 - On admission and every shift
 - Adults usually develop pressure injuries within the first 72 hours after admission
 - Pediatrics usually develop pressure injuries within the first 24 hours after admission

Note:

It is important to note that the regulatory bodies such as Centers for Medicare and Medicaid Services (CMS) and The Joint Commission (TJC) may require a different reassessment schedule. Be sure to know and follow the policies and procedures of your institution to ensure compliance with these requirements.

High Risk Populations

- Geriatrics
- Pediatric
- Neonates
- Spinal Cord Injury patients
- Spina bifida patients

Use of a Valid and Reliable Risk Assessment Tool

Research has shown that nurses' clinical judgement, when used alone, was inadequate to predict pressure injuries and clinical judgement should be used in conjunction with a validated risk assessment tool (WOCN, 2016, pg 12). In addition, current evidence is lacking to show that risk assessment tools reduce the incidence of pressure injuries. However, using these tools can help with pressure ulcer prevention (WOCN, 2016).

There are many risk assessment tools available for use by healthcare workers. It is important that the risk assessment tool be valid and reliable for the population it is being used with.

Examples include:

- Adult: The following two scales have been found valid and reliable and have demonstrated interrater reliability.
 - Braden
 - Norton
- Pediatrics
 - Braden Q – this tool has been studied the most in the pediatric population
 - Braden QD Scale – this tool based on the original Braden Q reliably predicts both immobility and device-related pressure injuries (Curley, Hasbani, Quigley, Stellar, Pasek, Shelley, et al., 2018)
 - Starkid Skin Scale – limited validity/reliability testing
- Neonatal
 - The Neonatal Skin Condition Score - limited validity/reliability testing (WOCN, 2016)

Test Your Knowledge

A risk assessment should be:

- A. **To determine the components the patient has, to develop a plan of care**
 - B. Completed weekly on hospitalized patients
 - C. Done on admission only
 - D. Done by a wound and ostomy certified nurse
-
- Rationale: A risk assessment should be performed on admission with serial reassessments on a scheduled basis and when the patient's condition changes. Acute Care
 - On admission and every 24-48 hours thereafter

Assessment

Skin Assessment

Skin assessments and inspection should be done on admission and a reassessment performed at least daily. Ensure that you know and follow your facility's policies and procedures regarding skin assessment.

The recommended skin assessment should include:

- A head-to-toe assessment focusing on high-risk areas
 - Bony prominences
 - Areas of erythema
 - Areas under devices
- An inspection of vulnerable pressure points for the immobile patient
 - Remove and inspect the skin under garments, devices
 - Shoes
 - Heel and elbow protectors
 - Orthotic devices
 - Protective sleeves
 - Treatment devices (oxygen tubing, face or BiPAP masks)
- The CMS recommend that five parameters are assessed during a skin assessment.
 - Skin color
 - Skin texture
 - Skin turgor
 - Skin integrity
 - Moisture status

(WOCN, 2016)

Immobility Assessment

Research suggests that immobility might be the most significant factor in pressure injury development.

Friction versus Shearing Assessment

When assessing the patient's skin, it is important to be able to differentiate between friction and shearing injuries. Knowing these differences can help you prevent pressure injuries.

- Friction is the rubbing of one body part against another or the force that resists relative motion between two body parts in contact and/or material elements sliding against each other (Brienza, Antokal, Herbe, Logan, Maguire ...Siddiqui, 2015 pg. 52).
 - Individuals who cannot lift, reposition, or transfer themselves are at risk for friction injuries
 - Shearing is the mechanical force that is parallel rather than perpendicular to the skin, which damages deep tissues such as muscles (Gefen, Farid, & Shaywitz, 2013).
 - Shear commonly occurs when the head of the bed is elevated and the patient slides downward
- (WOCN, 2016)

Incontinence Assessment

Healthcare providers should determine if incontinence is present or if the patient is at risk for incontinence. Risk factors for incontinence include:

- Urinary incontinence
 - Female gender
 - Older age
 - Neurologic disease (including stroke)
 - White race
 - Family history in females
 - Increased body mass
 - Decreased physical activity
 - Depression
 - Diabetes
- Fecal incontinence
 - Older adults
 - Nursing home residents
 - Patients with gastrointestinal disorders
 - Obstetric factors
 - Surgical procedure sequelae

(WOCN, 2016)

Nutritional Assessment

Nutrition and hydration are important to maintaining tissue integrity, prevention and treatment of pressure injuries. While there is little research to support nutrition's role in pressure injuries, best practice includes a nutritional assessment to decrease overall morbidity and mortality (WOCN, 2016).

Prior or Present Pressure Injury Assessment

Presence of a pressure injury or a history of pressure injuries increases the risk for additional pressure injuries (WOCN, 2016).

Wound Assessment

In many institutions there is a wound and skin assessment and management team, led by a certified wound and ostomy nurse. The presence of this team allows the bedside nurse to consult this team to determine the presence or absence, staging, and treatment of the pressure injury. Be sure to inquire if your institution has this type of team and how to access their expertise.

If a pressure injury is suspected or present, a thorough assessment of the injury should be performed. The following parameters should be documented:

- Date and time the suspect or actual injury was noted
- Description of the ulcer
 - Location- be specific regarding anatomical locations
 - Tissue type- if you are not sure document what you see
 - Epithelialization
 - Granulation
 - Hypergranulation
 - Slough
 - Eschar
 - Shape
 - Size/area
 - Length
 - Width
 - Depth
 - Presence or absence of exudate
 - Amount
 - Color
 - Odor
 - Presence or absence of infection
 - Wound edges
 - Open/attached
 - Closed or rolled - epibole
 - Presence or absence of tunneling
 - Stage of the ulcer
 - Pain
 - Location
 - Intensity
 - Quality
 - Onset
 - Duration
 - Alleviating factors



Image courtesy of Wikipedia

- Aggravating factors
 - Differentiate injuries
 - Pressure injuries – located over bony prominences or under medical devices
 - Moisture-associated skin damage – superficial skin injury caused by exposure to urine or fecal incontinence
- (WOCN, 2016)

It is also important to determine the patient's potential for healing, factors that impede healing, willingness to adhere to the treatment program, and the impact a pressure injury may have on the patient's quality of life. The care you give a person at the end of life may differ from other patients, ensure that you know this patient's goals.

Test Your Knowledge

A wound and skin assessment should include:

- A. Frequent linen changes
- B. **Patient's potential for healing**
- C. Use of a skin care bundle
- D. Use of a pressure relieving device

Rationale: It is also important to determine the patient's potential for healing, factors that impede healing, willingness to adhere to the treatment program, and the impact a pressure injury may have on the patient's quality of life.

Prevention

Prevention of pressure ulcers should be a priority for all patients in healthcare facilities. Utilizing a standardized approach to skin care has the potential to prevent or to facilitate early recognition of pressure injury. A standard approach to skin care should include:

- The use of skin care bundle of care
- The use of valid/reliable risk assessment tools
- Pain management utilizing valid/reliable pain assessment tools for the population
- Minimization pressure related to medical devices
- Minimization of friction and shear
 - Friction and shear injuries are enhanced in the presence of moisture
 - Ensure the incontinent patient is clean and dry after each episode
- The use of lift sheets or lift equipment
- Minimization of pressure
 - Turning and repositioning patients
 - Use of devices that off-load and redistribute pressure, some examples include heel protectors and pillows
 - Use of support surfaces that redistribute pressure
 - Avoid use of foam rings, donut-type devices
 - Avoid use of excessive linens over support surfaces
- The use of skin barrier creams, ointments, pastes, and film-forming skin protectants

- A nutritional consult
- Patient/caregiver education
(WOCN, 2016)

Test Your Knowledge

Prevention of pressure injuries include:

- Minimization of friction and shear**
- Removal of all pressure sources
- Pressure ulcers cannot be prevented
- Use of donut-type devices

Rationale: Prevention of pressure ulcers should be a priority for all patients in healthcare facilities. Utilizing a standardized approach to skin care has the potential to prevent or to facilitate early recognition of pressure injury. A standard approach to skin care should include:

- The use of skin care bundle of care
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 - Use of support surfaces that redistribute pressure
 - Avoid use of foam rings, donut-type devices

Staging

Pressure injury classification/staging systems are NOT meant to be utilized without the ongoing clinical judgment and assessment by the health care provider.

Staging of pressure injuries should be performed by healthcare providers who have obtained the necessary education to recognize each stage of a pressure injury.

The National Pressure Ulcer Advisory Panel updated and published new staging guidelines in 2014. The following section will provide the newest information and images to help determine what stage injury your patient may have. The images are provided free by the NAPUAP.

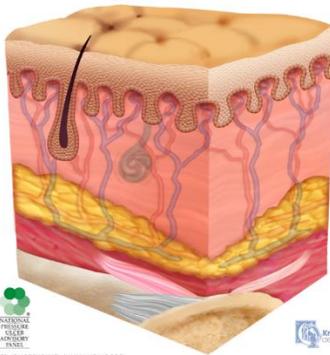
The stages that will be covered include:

- Stage 1
- Stage 2

- Stage 3
- Stage 4
- Unstageable
- Suspected deep tissue injury

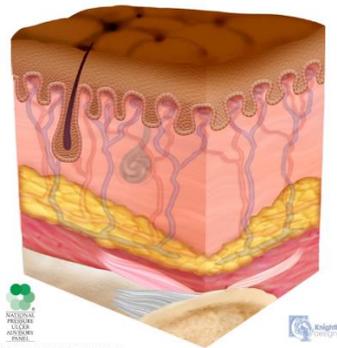
Staging begins with being able to recognize healthy non-injured skin in both lightly and darkly pigmented skin.

Healthy Skin – Lightly Pigmented



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Healthy Skin – Darkly Pigmented



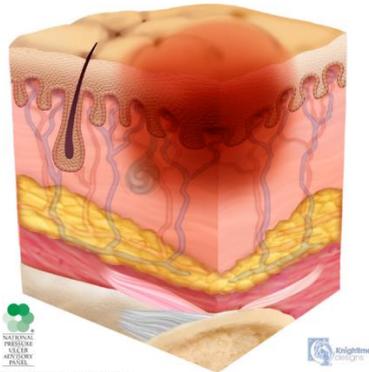
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Stage 1 Pressure Injury: Non-blanchable erythema of intact skin

- Intact skin with non-blanchable redness of a localized area usually over a bony prominence
- The area may be painful, firm, soft, warmer or cooler than adjacent tissue
- Color changes do not include purple or maroon discoloration

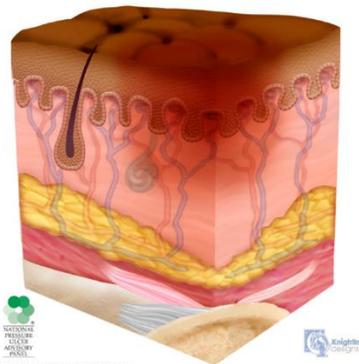
(WOCN, 2016)

Stage 1 Pressure Injury - Lightly Pigmented



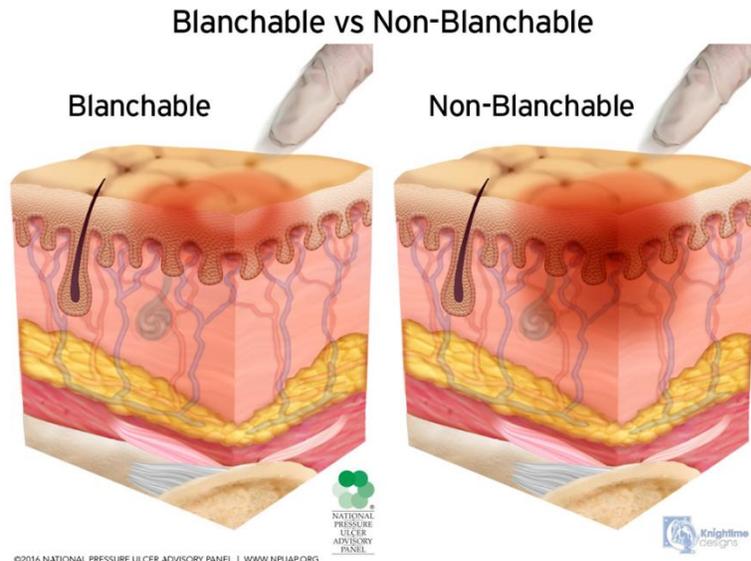
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Stage 1 Pressure Injury – Darkly Pigmented



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Images courtesy of the NPUPA, 2014



Images courtesy of the NPUPA, 2014

Test Your Knowledge

Who can stage a pressure injury?

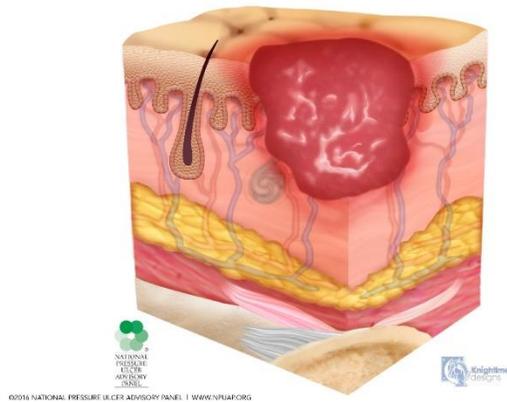
- A. Physicians
- B. Advanced practice nurses
- C. **Well-educated, experienced nurses**
- D. Wound and skin nurses

Rationale: Pressure injury classification/staging systems are NOT meant to be utilized without the ongoing clinical judgment and assessment by the health care provider. Staging of pressure injuries should be performed by healthcare providers who have obtained the necessary education to recognize each stage of a pressure injury.

Stage 2 Pressure Injury: Partial -thickness skin loss with exposed dermis

- Partial thickness skin loss with exposed dermis is viable, pink or red, moist, and may be an intact or ruptured blister
- Adipose/fat tissue, deeper skin structures, granulation tissue, slough, and eschar are NOT present
- Commonly occur due to shearing injuries
- This type of wound should not be confused with
 - Moisture-associated skin damage
 - Medical adhesive related skin injury
 - Traumatic wounds such as skin tears, burns, abrasions (WOCN, 2016)

Stage 2 Pressure Injury



Test Your Knowledge

Stage this injury: Ruptured blister

- A. Stage 1
- B. **Stage 2**
- C. Non-blanchable
- D. Not a pressure injury

Rationale: Stage 2 Pressure Injury: Partial -thickness skin loss with exposed dermis

- Partial thickness skin loss with exposed dermis
- Wound is viable, pink or red, moist, and may be an intact or ruptured blister
- Adipose/fat tissue, deeper skin structures, granulation tissue, slough, and eschar are NOT present

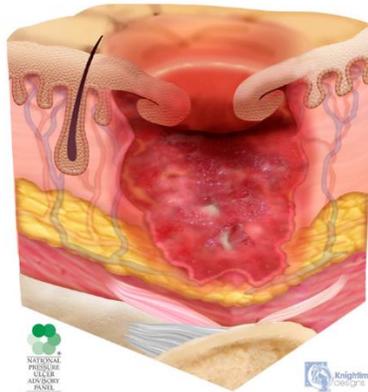
Stage 3 Pressure Injury: Full-thickness skin loss

- Full thickness skin loss with visible adipose/fat tissue visible in ulcer
- Granulation tissue and rolled wound edges (epibole) are often present
- Slough and eschar may be visible
 - If eschar or slough obscures the extent of tissue loss this becomes an unstageable injury
- Depth of tissue damage is variable based on location of injury
 - Places that have subcutaneous tissue may be shallow
 - Nose
 - Occiput
 - Ears
 - Malleolus
- Fascia, muscle, tendon, ligament, cartilage and /or bone are NOT exposed (WOCN, 2016)

Stage 3 Pressure Injury with Epibole



Area of Focus



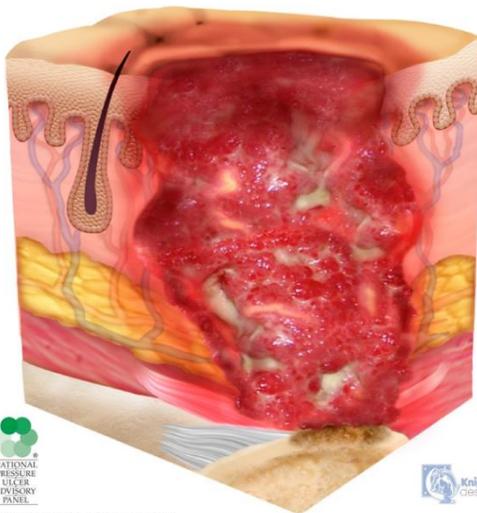
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Images courtesy of the NPUPA, 2014

Stage 4 Pressure injury: Full-thickness skin and tissue loss

- Full thickness tissue loss with exposed or directly palpable fascia, bone, tendon, ligament, cartilage, or muscle.
- Slough or eschar may be present
 - If eschar or slough obscures the extent of tissue loss this becomes an unstageable injury
- Tunneling, undermining, or epibole are often present
- Depth of tissue damage is variable based on location of injury (WOCN, 2016)

Stage 4 Pressure Injury



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Images courtesy of the NPUPA, 2014

Tunneling and Undermining Images



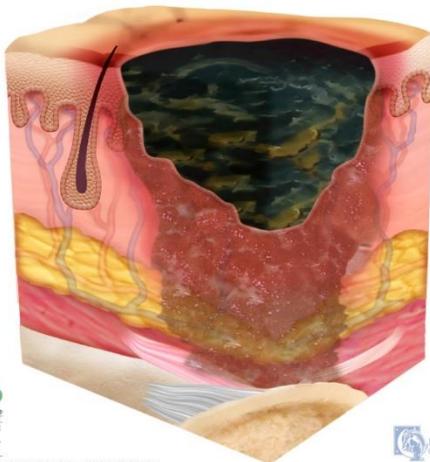
- Tunneling is a channel that extends from any part of the wound through subcutaneous tissue or muscle
- Undermining is tissue destruction that occurs under intact skin around the wound perimeter

Unstageable Pressure Injury: Obscured full-thickness skin and tissue loss

- 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 obscuring the extent of the tissue damage
- If slough or eschar is removed, a stage 3 or 4 pressure injury will be revealed
- Stable (dry, adherent, intact without erythema or fluctuance) eschar on an ischemic limb or heel should not be removed

(WOCN, 2016)

Unstageable Pressure Injury - Dark Eschar



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Images courtesy of the NPUPA, 2014

Deep Tissue Pressure Injury: Persistent non-blanchable deep red, maroon or purple discoloration

- Intact or non-intact skin with a localized area of persistent non-blanchable deep red, maroon, or purple discoloration or
- Epidermal separation revealing a dark wound bed or blood-filled blister
- Discoloration may appear differently in darkly pigmented skin
- This type of injury may evolve to reveal the extent of the injury or resolve without tissue loss
- If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this is a stage 3 or 4 injury.
- Do not use this stage to describe vascular, traumatic, neuropathic, or dermatological conditions

(WOCN, 2016)

Deep Tissue Pressure Injury



Images courtesy of the NPUPA, 2014

Test Your Knowledge

Stage this injury: Full-thickness tissue loss, underlying bone and muscle is visible, eschar is present.

- Stage 3
- Stage 4**
- Unstageable
- Deep tissue injury

Rationale: Stage 4 Pressure injury: Full-thickness skin and tissue loss

Full thickness tissue loss with exposed or directly palpable fascia, bone, tendon, ligament, cartilage, or muscle. Slough or eschar may be present

Treatment

Treatment of pressure injuries is multifaceted. The mainstays of pressure injury treatment include:

- Pressure relief
- Infection control
- Debridement
- Wound care

Pressure Relief

As described in the pressure injury prevention section, the healthcare worker must find appropriate methods to relieve the pressure source related to the injury. Methods include:

- Frequent repositioning
- Frequent reassessment
- Selecting the correct support surface

Infection Control

There is little evidence to support the use of intravenous or locally applied antibiotics. A clean pressure injury, even with some necrotic tissue, does not require the use of antibiotics. Intravenous antibiotics are recommended only if there is osteomyelitis and even then, there is little evidence for its use (Boyko, Longaker, & Yang, 2018).

Debridement

Most pressure injuries do not require debridement and there are instances where debridement is contraindicated such as an injury with dry eschar without signs of infection.

Wounds that have a significant amount of necrotic tissue may require an initial debridement and subsequent debridements to determine the extent of the necrosis.

Injuries that have little subcutaneous tissue below the wound, such as ears and heels, should be debrided with care (Boyko, Longaker, & Yang, 2018).

Wound Care

Wound care is essential to management and treatment of pressure injury. Wound healing is optimized in a moist environment.

There are algorithms to help the healthcare provider determine the treatment needed.

It is important to note that there is no superiority of one dressing over another, healthcare provider experience and preference is often the defining reason for choice of dressing (Boyko, Longaker, & Yang, 2018).

Negative Pressure Wound Therapy

Negative pressure wound therapy has a place in treating pressure injuries. This therapy has been shown to speed wound healing in chronic wounds (Boyko, Longaker, & Yang, 2018).

Picking the right dressing for the right injury

Occlusive or semi-occlusive dressings maintain wound bed moisture to promote epithelialization and wound closure. Select a wound dressing based on the:

- Ability to keep the wound bed moist
 - Need to address bacterial bioburden
 - Nature and volume of the wound exudate
 - Condition of the peri ulcer skin
 - Ulcer size, depth and location
 - Presence of tunneling and/or undermining
 - Amount of healing or deterioration
- (NPUAP, 2014)

Hydrocolloid Dressings

Wafer type dressing that contains gel-forming agents in an adhesive compound laminated onto a flexible, water resistant layer.

Benefits include:

- Allow a moist healing environment
- Autolytic debridement
- Insulation
- Impermeable to bacteria and other contaminants
- Self-adherent & molds well to intact skin around the wound
- Can be worn for several days without needing to be changed

Indications for use:

- Clean Stage 2 pressure injury in body areas where they will not roll or melt
 - Non-infected, shallow Category/Stage 3
 - Protection of intact skin or newly healed wound
 - Not recommended for wounds with heavy exudate, sinus tracts or when infection is present
- (NPUAP, 2014)

Transparent Film Dressings

There is little to no research to support transparent dressing for treatment of pressure injury.

Consider using a transparent film dressing:

- For autolytic debridement when an individual is not immunocompromised
 - Secondary dressing for pressure injury treated with alginates or other wound filler that will likely remain in the ulcer bed for an extended period
 - Do not use as an interface layer over pressure injury with moderate to heavy exudate
 - Do not use as the over dressing for enzymatic debriding agent, gel or ointment
- (NPUAP, 2014)

Hydrogel Dressings

Hydrogel dressings are a hydrated polymer (hydrogel) dressing that contain 90% water in a gel base. It helps regulate fluid exchange from the wound surface.

Hydrogel dressings are available in three forms:

- *Amorphous hydrogel*- free flowing gel, packaged in tubes, foil packets and spray bottles.
- *Impregnated hydrogel*-amorphous hydrogel saturated onto gauze pad, nonwoven sponge ropes and/or strips.
- *Sheet hydrogel*- a gel supported by a thin fiber mesh. The dressing can overlap intact skin without causing trauma. It is available with/without adhesive borders and can be cut to fit wound size.

Benefits include:

- Soothing and reduce pain
- Rehydrate the wound bed
- Facilitate autolytic debridement
- Fill in dead space (amorphous and impregnated types)
- Can be used when infection is present

Indications for use:

- Shallow wounds that have minimal exudate
- Wounds with dry ulcer beds
- Painful pressure injury
- Hydrogel sheets for wounds without depth and contours and/or body areas that are at risk for dressing migration
(NPUAP, 2014)

Alginate Dressings

Alginates are a non-woven absorbent dressing derived from seaweed. Alginates are placed into a wound in a dry form, they absorb exudate to form a hydrophilic gel while still maintaining a moist wound environment. Manufactured in sheets or rope forms.

Benefits include:

- Can be left on an ulcer for several days to decrease frequency of dressing changes

Indications for use:

- Bleeding wounds (helps achieve hemostasis)
- Wounds with moderate to heavy exudate
- Full or partial thickness wounds with tunneling and or/undermining
- Clinically infected wounds when there is appropriate concurrent treatment of infection.

Contradictions for use:

- Third-degree burns
- Minimal exudate or dry wounds

Tips:

- Gently remove alginate dressings from the wound by irrigating first
- If alginate dressing is still dry on dressing changes, consider lengthening time intervals for dressing changes or changing the type of dressing.
(NPUAP, 2014)

Foam Dressings

Foam dressings absorb wound exudate from the wound bed.

- Simple foam dressings- wick exudate away from the wound bed and translocate it to the surface of the wound dressing
- Complex foam dressings- absorb wound exudate by dispensing it throughout the wound dressing for retention away from the skin
- Gelling foam dressings manage excess wound exudate and protect surrounding skin from prolonged exposure to wound or body fluids

Benefits include:

- Wounds with moderate to heavy exudate
- Decreases maceration of peri wound tissue

Indications for use:

- Stage 2 with exudate
- A shallow Stage 3
(NPUAP, 2014)

Silver-Impregnated Dressings

The use of silver-impregnated dressings is intended to reduce bioburden (the number of bacteria living on a surface)

Silver impregnated dressings continue to be debated and currently there is little scientific literature to base recommendations on use of silver in wound care

- It should be used to reduce bioburden and discontinued once healing is noted
- Prophylactic use of silver dressings should be carefully considered
(NPUAP, 2014)

Honey Impregnated Dressings

Medicinal and healing properties of honey have been recognized for ages. Recently a resurgence of interest has occurred and grown in popularity for wound care products.

Benefits include:

- Honey produces hydrogen peroxide, contains antioxidants and releases anti-inflammatory products
- Helps in reduction of odor
- Studies have shown an increased healing rate of those treated with honey for stage II and III pressure injury
(NPUAP, 2014)

CAUTION: Before applying honey dressing, ensure individual is not allergic to honey. Individuals who have bee or bee stings allergies are usually able to use properly irradiated honey products.

Gauze Dressings

Gauze dressings are made of cotton or synthetic fabric that is absorptive and permeable to water, water vapor and oxygen.

Gauze dressings have been associated with:

- Increased infection rate
- Retained dressing particles
- Pain

(NPUAP, 2014)

CAUTION: Avoid use of wet-to dry gauze dressings for open pressure injuries.

Assessing Healing

Pressure injury should be assessed at each dressing change for progress towards healing. Currently, monitoring for healing of pressure injury is based on the clinical judgement of the healthcare professional and the use of pressure ulcer assessment tools.

One such tool is the Pressure ulcer scale for healing (PUSH). This tool was developed and validated by NPUAP to monitor pressure ulcer healing over time. This tool monitors 3 parameters considered most indicative of healing:

- Size (length & width), exudate amount, and tissue type
 - Record a sub score 0-5 (size) and 0-4 (exudate & tissue type)
 - Total score calculated ranges from 0-17 (0 = healed)
 - Comparison of total scores over time provides an indication of the improvement or deterioration in pressure ulcer healing

Photography is a valuable tool which has proven to be reliable and successful in capturing the pressure ulcer condition over time. Be sure you know and follow your facilities policies and procedures on use of photography. (NPUAP, 2014)

Conclusion

Pressure injuries represent a growing and costly phenomenon for healthcare.

Prevention is key!

However, pressure injuries continue despite rigorous prevention strategies because of the microclimate and patient conditions. Therefore, it is imperative that healthcare facilities educate their providers, set up a wound and ostomy team, define treatment strategies based on national guidelines, and routinely assess patients for risk of pressure injury.

Resources

An Evidence- and Consensus-Based Support Surface Algorithm

This is an interactive module to help healthcare workers determine which support surfaces should be considered/used

<http://algorithm.wocn.org/#ready>

Clinical Tools for the WOCN

<https://www.wocn.org/page/ClinicalTools>

Pressure Ulcer Evaluation: Clinical Resource Guide by the WOCN

[https://c.ymcdn.com/sites/www.wocn.org/resource/resmgr/Publications/Pressure_Ulcer_Eval_CRG_\(201\).pdf](https://c.ymcdn.com/sites/www.wocn.org/resource/resmgr/Publications/Pressure_Ulcer_Eval_CRG_(201).pdf)

Pressure Ulcer Scale for Healing (PUSH)

<http://www.npuap.org/wp-content/uploads/2012/03/push3.pdf>

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