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Objectives

- 1. Pressure Injuries (PI's) why are they important
- 2. Identify PI's
- 3. Common Risk Factors and Locations of PI's
- 4. Demonstrate assessment and staging of PIs
- 5. Follow the protocol for intervention of PIs
- 6. SKINN BUNDLE

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Why Are Pressure Injuries Important?

- 1. PATIENT QUALITY and SAFETY Issue
- 2. Jan. 2007 CMS (Centers for Medicare and Medicaid Services) SB 1301 will not reimburse hospitals for **Stage 3, 4, and Unstageable Pressure Injuries Acquired in the Hospital.**
- UPDATES: Acronyms that will be used: HAPU vs. CAPU...now HAPI or CAPI; Ulcer=Injury
- If there is a HAPI that is a Stage 3, 4, or Unstageable, the hospital is fined \$100/day after 5 days from discovery date if the chart is not disclosed to CDPH. Possibly in the near future we will pay for the cost of treatment of the wound.
- Coding is not consistent- CAPI's are missed due to lack of documentation on Admission from the Physician and Nursing.



Why Pressure Injuries?

- Staging can affect placement- Board & Care and Assisted Living Facilities
- Increase in negligence litigation in not meeting standards of care



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STATISTICS- Show me the MONEY!

Literature shows:

“Stage I, II, III HAPU’s cost estimates range from \$2000 to \$30,000 per hospital stay, with Stage IV estimated as high as \$70,000.”



“Ultimately, HAPU’s cost 2.41 billion dollars in excess healthcare costs.”

*Hospital Acquired Pressure Ulcers in the Intensive Care Unit: A Literature Review. Page 2. Created Feb 12, 2010 by Cecilia Crawford RN, MSN, AP-SCN. Nursing Research Program

[View the full image](#)

Consider the Quality of Life of Patients with Pressure Injuries:

- “Although the financial costs associated with pressure ulcers are high, the human toll of pain, depression, altered self-image, stress, infection, and increased mortality and morbidity is immeasurable”
- “Strongly associated with mortality and lengthy stays in the acute, post acute, and long-term-care settings. Incidence rates vary considerably by clinical setting, from up to 38% in acute care and up to 23.9% in long-term care to up to 17% in home care”
- “Hospital-acquired pressure ulcers have been associated with a greater risk of death within 1 year. **This translates into an estimated 60,000 deaths each year due to hospital-acquired pressure ulcers.**ar of hospitalization. Because of this impact, the Centers for Medicare and Medicaid Services (CMS) implemented a nonpayment policy for hospital-acquired Stage III and IV pressure ulcers.”

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History of Pressure Injury Staging

- First record of pressure ulcer by Hippocrates in 400 BC
- Shea developed the first well documented method in 1975
- In 1988 the IAET (now WOCN) developed a four-level staging system
- In 1989 NPUAP also developed a four-stage system



[WOCN](#)

Pressure Injury Updates per NPUAP

- Pressure injury is listed as a synonym for pressure ulcer in the beta draft of the ICD-11.
- There have been ongoing discussions between NPUAP and CMS to facilitate implementation for documentation, quality monitoring and reimbursement.



[WOCN](#)

NPUAP POSITION PAPER CLARIFICATION- INJURY



- Diagnosis of Pressure injury simply means the tissue is injured by pressure (and/or shear). It does not assign blame or in any way imply that the injury was "caused" by anything that health care providers "did" or "failed to do". "Injury" occurs frequently in the medical literature (e.g., kidney injury, spinal cord injury, closed head injury) to identify the existence of tissue injury, without assigning blame.
- "Pressure injury" is a more accurate label than "pressure ulcer" because some presentations of the phenomena are not open ulcers; yet all can be legitimately classified as tissue injuries.
- Use of the term "pressure injury" has encouraged providers to refocus on "prevention". Injuries can often be prevented (e.g., falls). Ulcers are usually part of larger pathological process (e.g., venous ulcers, diabetic foot ulcers).

[WOCN](#)

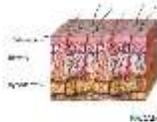
NPUAP Clarification

- Staging system does NOT imply linear progression of pressure injuries from Stage 1 through Stage 4, nor does it imply healing from Stage 4 through Stage 1
- NPUAP’s system implies no progression in any direction. In collaboration with its international partner (the European Pressure Ulcer Advisory Panel), a recommendation was made to change the word, “stage” (or “grade”), to “category” to convey non directionality. Many European countries have replaced “stage” or “grade” with “category” to avoid this. The United States chose to stay with the term “stage”; however, this was done with the clear understanding that “stage” should not imply progression or reverse staging.



Challenges with Staging

- Understanding of anatomy
- Recognizing layers of the skin
- Knowledge of staging system
- Wound classification
 - Moisture
 - Candidiasis
 - Neuropathic
- Uncertainty in accuracy



Definition of Pressure Injury

- A pressure injury is localized damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical device
- The injury can be 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**
 - **Pressure:**
 - Pressure is the force per unit surface area that is applied vertically or perpendicular to the surface of the skin.
 - Pressure deforms underlying tissue and compresses small blood vessels hindering blood flow and nutrient supply.
 - **Shear:**
 - Shear is the force per unit surface area applied parallel to the skin surface.
 - Shear occurs when one layer of tissue slides horizontally over another, deforming adipose and muscle tissue, and disrupting blood flow.
- The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.



...Over a Bony Prominence



www.pressureulcers.com

Where do Pressure Injuries Occur?

- Pressure injuries usually occur over bony prominences, such as:
 - Occiput
 - Ears, nosebridge
 - Scapula
 - Spinous Processes
 - Shoulder
 - Elbow
 - Heel
 - Iliac Crest
 - Sacrum/Coccyx
 - Ischial Tuberosity
 - Trochanter
 - Knee
 - Malleolus
 - Toes

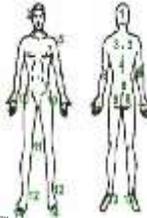
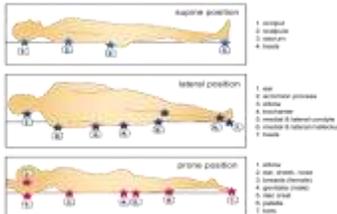


Image adapted from NINDS www.ninds.nih.gov, 2014 (Feb 27, 2014)

www.pressureulcers.com

Common Pressure Ulcer Sites



www.pressureulcers.com

Pressure Ulcer Sites in the Elderly



Risk Factors

Patient Assessment	Patient Assessment	Patient Assessment
<ul style="list-style-type: none"> Age Immobility Incontinence History of PI Post-Op Multiple chronic diseases 	<ul style="list-style-type: none"> Multiple chronic diseases Low Albumin Poor Nutrition Dehydration Vasopressors Ventilator 	<ul style="list-style-type: none"> Medications Friction Shear Temperature Poor circulation Low Albumin

Stage 1 Pressure Injury



Non-blanchable erythema of intact skin

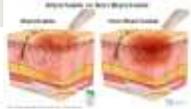
- Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin.
- Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes.
- Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury.

Stage 1 Pressure Injury Example



Non-blanchable erythema of intact skin

- Skin color over the affected site is deeper in color than the surrounding skin.
- The skin surface is unbroken.
- The alteration in skin color persists after pressure relief.



Stage 2 Pressure Injury



Partial-thickness skin loss with exposed dermis

- 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 tissues are 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.
- This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), intertriginous dermatitis (ITD), medical adhesive related skin injury (MARS), or traumatic wounds (skin tears, burns, abrasions)

Stage 2 Pressure Injury Example



Partial-thickness skin loss with exposed dermis

Stage 4 Pressure Injury



Full-thickness skin and tissue loss

- 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

Stage 4 Pressure Injury Example



Full-thickness skin and tissue loss

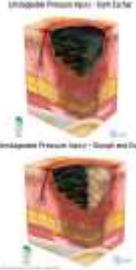
- Tissue loss extends to muscle or underlying structure
- The base of the wound is visible



Stage 4 Pressure Injury Example



Unstageable Pressure Injury



Obscured full-thickness skin and tissue loss

- 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 (i.e. dry, adherent, intact without erythema or fluctuance) on the heel or ischemic limb should not be softened or removed.

Unstageable Pressure Injury Example



Obscured full-thickness skin and tissue loss

- An injury is considered unstageable if:
 - The injury is covered with eschar or slough
 - The true base of the wound cannot be seen



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Deep Tissue Pressure Injury (DTPI)



Persistent non-blanchable deep red, maroon or purple discoloration

- Intact or non-intact skin with localized area of persistent non-blanchable 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
- Results from intense and/or prolonged pressure and shear forces at the bone-muscle interface

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NPUAP DTPI Clarification 2017:

- Deep Tissue Pressure Injury (DTPI) may evolve into a full thickness wound **despite optimal care**. A DTPI may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss.
- Off-loading the area still offers the best chance for tissue that is ischemic or injured, but not infarcted.
- However, given the current state of the science, it remains true that DTPI may evolve “exposing additional layers of tissue even with optimal treatment”.
- Evolution of a DTPI on admission to a Stage 3 or 4 pressure injury should not be counted as “worsening” under this measure



Deep Tissue Pressure Injury Example



Persistent non-blanchable deep red, maroon or purple discoloration

- 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.

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Deep Tissue Pressure Injury Example



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Medical Device Related Pressure Injury

- This describes an etiology.
- 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.
- Examples: Respiratory devices, Casts and orthotics, IV tubing and boards, Pulse oximetry probes, braces, Cervical collars



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NPUAP 2017 FINAL Clarifications on Staging

- 1) If the type of tissue in the wound base can be evaluated, numerically classify as Stage 1 or 2 or 3 or 4, based on the deepest tissue type exposed.
- 2) If the wound base cannot be evaluated, classify as:
 - a) Deep Tissue Pressure Injury (DTPI) when the skin is intact with deep red, purple or maroon discoloration or blood blister(s).
 - b) Unstageable when the base is obscured by slough or eschar.
- 3) If on a mucosal membrane, document, **but do not stage**



What Stage is this?



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SKKIN BUNDLE

- 5 key interventions- when implemented, simultaneously provide synergistic effect which promotes the desired outcome of maintaining skin integrity.
- **S = Support Surface**
- **K = Keep turning**
- **K= Keep skin protected.**
- **I = Incontinence/Moisture management**
- **N = Nutrition**

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SKKIN BUNDLE

- **S = Support Surface** (airway device protection, heels boots, pressure redistribution bed/overlays, waffle/Roho chair cushions)
- **K = Keep turning** (every 2 hours or if refusing)
- **K= keep skin protected** (silicone foam dressings, heels offloaded, tubing devices free from skin contact)
- **I = Incontinence/Moisture management** (skin sealant/moisture barrier,
- **N = Nutrition** (Nutrition consult)

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CHAIR CUSHION = NO DONUT CUSHION



- Use EHOB waffle chair cushion instead!
- Requirements: Must have wheelchair - even if private owned
- Do not over inflate.
- Place in pillowcase for comfort.



Heel Boot/Protectors- Not Created Equal



WOUND HEALING SUPPLEMENTS/DIET



PROTEIN



- Synthesis of enzymes for PI healing, cell multiplication, collagen and connective tissue synthesis.
- All stages of healing require adequate protein.
- Inc protein linked to improved healing rates.
- IOM recommendation 0.8kg/kg/body weight per day but those with PI's need more for wound healing
- High exuding wounds increase Nitrogen loss thus increasing protein needs



AMINO ACIDS Improve Healing Rates



- Building blocks of protein
- **Arginine (6g-9g) and Glutamine**- essential during periods of severe stress (PI's, trauma, sepsis). Arginine supports formation of protein in cells.
- Some evidence of improved healing with arginine enriched mixed nutritional supplement vs. standard hospital diet

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MICRONUTRIENTS- VITAMIN C



- Those with PI's may not consume enough to meet dietary standards
- Vitamin C- antioxidant that's needed for collagen formation
 - RCT's showed use of: **250-750mg/day**
 - RCT- no improvement in complete PI healing for adults with 1g Vit C daily vs. control group 10mg Vit C daily.
 - Fruits and vegetables- citrus fruits can achieve daily recommended intake
 - Vit C at physiological doses should be considered when dietary deficiency is diagnosed



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MICRONUTRIENTS- ZINC



- Zinc- cofactor for collagen formation, antioxidant, synthesis for protein, DNA, RNA, proliferation of inflammatory cells and epithelial cells.
- Zinc is transported through Albumin. Zinc absorption declines when plasma albumin declines (infection, sepsis, trauma)
- **Zinc deficiency seen**- increased wound drainage, poor dietary intake, excessive GI loss
- Zinc deficiency causes loss of appetite, abnormal taste, impaired immune function, impaired wound healing
- **Zinc food sources**: high protein meat, liver, shellfish
- No research has demonstrated effect of zinc supplementation of PI healing
- **RCT's showed use of: 18mg-27mg/day**
- **No more than 40mg/day but stop once deficiency corrected since it can affect copper and result in anemia**
 - Hi zinc levels inhibit healing, impair phagocytosis, induces copper deficiency since both minerals compete for binding sites on albumin molecule

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