Pressure Injuries: Basic and Applied Concepts to Optimize Wound Care

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Advantage Surgical and Wound Care

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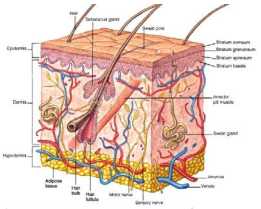
Washington, DC - The term "pressure injury" replaces "pressure ulcer" in the National Pressure Ulcer Advisory Panel Pressure Injury Staging System according to the NPUAP. The change in terminology more accurately describes pressure injuries to both intact and ulcerated skin. In the previous staging system Stage 1 and Deep Tissue Injury described injured intact skin, while the other stages described open ulcers. This led to confusion because the definitions for each of the stages referred to the injuries as "pressure ulcers".

Pressure Injury Definition

- "Pressure Ulcer/Injury (PU/PI)" refers to localized damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical or other device. A pressure injury will present as intact skin and may be painful.
- A pressure ulcer will present as an open ulcer, the appearance of which will vary depending on the stage 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 skin temperature and moisture, nutrition, perfusion, co-morbidities and condition of the soft tissue.

Stage I Pressure Injury

- 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.



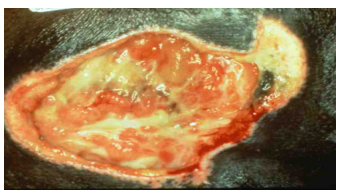
Stage II Pressure Injury

- Dermis: 0.3 mm (eyelid) to 3mm (back)
- 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.

What's this?

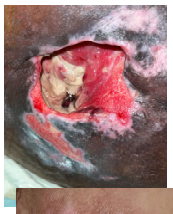
Stage III Pressure Injury

- Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges) are 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 and/or bone are not exposed. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury



Stage IV Pressure Injury

- 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 III & IV Not Always Deep

- The depth of stage three varies by anatomical location. Stage 3 pressure ulcers can be shallow, particularly on the areas that do not have SQ, such as bridge of the nose, ear, occiput, malleolus.

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

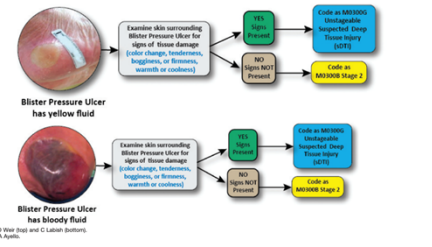
DTI

- 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.
- 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

Deep Tissue Pressure Injury

Stage II Vs. DTI

DECISION ALGORITHM FOR DETERMINING STAGE OF BLISTER PRESSURE ULCER USING THE CENTERS FOR MEDICARE & MEDICAID SERVICES DEFINITIONS IN LONG-TERM CARE



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MASD

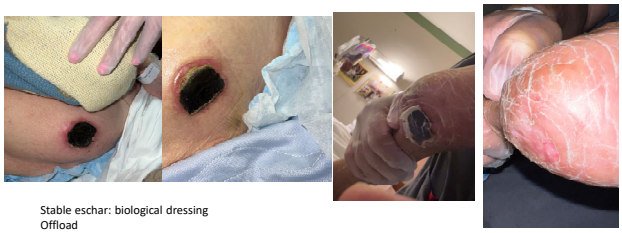
- Moisture +- friction
- Buttocks, perineum, upper thigh
- Usually blanchable erythema
- Diffuse, irregular
- Maybe partial thickness (exposed dermis)
- No necrosis/slough

PI

- Pressure +- shear
- Bony prominences
- Oval, round, distinct edges

Recognize Healthy Granulation Tissue

Stable Eschars



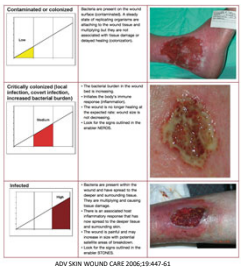
Stable eschar: biological dressing
Offload
Appropriate wound care

Recognize Emergent Debridement

Debride: Minimal Trauma to Tissues

Use Antibiotics: When Needed

- **Wound not responding to current therapy**
- **Increasing pain**
- **Thick slough non responding to debridement and other therapies**
- **Odor, ↑ exudate**
- **Friable granulation tissue**
- **Satellite wounds**
- **Erythema (change!)**
- **Treat osteomyelitis**



ADV SKIN WOUND CARE 2006;19:447-61

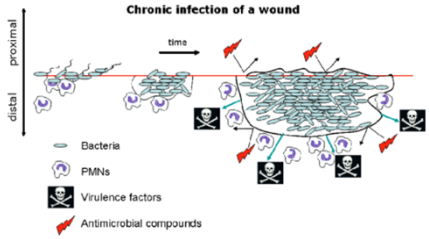
Don't Waste Products

- Cross hatch
- Accelerate wound healing
- My opinion: wet to moist works, <u>if used appropriately</u>

Recognize Biofilms

- Bacterial colonies encased in extracellular polymeric substance (EPS, slime): DNA, proteins, polysaccharides
- EPS reduces penetration by antibiotics
- Bacteria occupy 5-30% volume of the biofilm
- 6% acute and 60% chronic wounds
- Bacteria in biofilms
  - Polymicrobial: aerobic & anaerobic
  - In a ↓ metabolic state
  - Resistant to antibiotics
  - Traditional culture may fail to identify majority of the species
  - Produce virulence factors

Biofilm: Evolution & Persistence



(J. Wound Repair Regeneration, 2008 Jan-Feb; 16 (1): 2-10

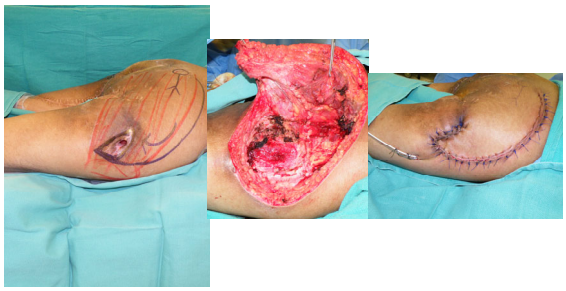
Biofilms

- Debride
  - Mechanical/surgical
  - Enzymatic/collagenase
    - Not indicated
- Topical antiseptics – short term
  - HOCL
  - Iodine based peoducts
  - Dakins®
  - Acetic acid

Recognize a Non-Healing Wound

- Examine wound geometry, state of local tissues & note comorbidities
- Options
  - Wide debridement (in OR) +- NPWT
  - Flap reconstruction

Chronic Ischial Wound



Housekeeping Rules

- Ulcer caused by pressure on heel of a DM patient is a pressure injury and not a diabetic ulcer
- You cannot downgrade a pressure Injury
  - IV does not become III
  - III does not become II
- Open DTI: reclassify to appropriate stage
- Surgical debridement: continue to label as Pressure Injury
- SP flap reconstruction: surgical wound
  - If flap breaks down, code as surgical wound
- If a resident acquires in house PI, is hospitalized & re-admitted with same stage: In House Ulcer
- If readmitted with higher stage: Present on Admission

Address the Patient as a Whole

Local Factors

- Local circulation/oxygenation
- Mechanical stress (pressure, friction & shear)
- Sensation
- Infection
- Edema
- Foreign bodies
- Necrotic tissue
- Radiation
- malignancy
- Maceration/excessive exudate
- Desiccation

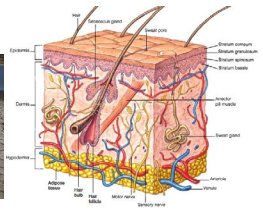
Systemic factors

- Age
- Obesity
- Nutrition
- Medical comorbidities:
  - DM, cardiac disease, pulmonary disease, metabolic diseases, vascular diseases, connective tissue disease
- Medications:
  - steroids, immunosuppressant's
- Social:
  - Alcohol, stress
  - Smoking
    - 1 cig: 90 mins vasoconstriction
    - 1 pack: all day vasoconstriction

Recognize Wound Contraction

A healed wound can reduce by up to 80% of its original size (1/5)

Lake Tahoe: No Sweat Glands



Moisturizer!

Moisturizer & Barrier Ointments

- Lotion
  - most water
    - Preservative can be irritant
- Creams
  - Less water, may contain emollients,
  - humectants and occlusives
- Barrier/Occlusives
  - Petrolatum
    - Thick, greasy
  - Zinc oxide
  - dimethicone

Thank you

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