Skin Failure: Understanding Pressure Injuries and Skin Tear – How to Assess and Stage Pressure Injuries and Skin Tears

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SKIN FAILURE

Organ Failure: Definition

- **Organ dysfunction** is a condition where an organ does not perform its expected function.
- **Organ failure** is organ dysfunction to such a degree that normal homeostasis cannot be maintained without external clinical intervention.
- Organ failure as a terminology is not a diagnosis.
- It can be classified by the cause, but when the cause is not known, it can also be classified by whether the onset is chronic or acute.
Heart Failure

• Yes!

Diastolic
- Stiff and thick chambers
- Heart can’t fill

Systolic
- Stretched and thin chambers
- Heart can’t pump

Renal Failure

• Yes!

Glomerulus
- Normal
- Damaged

Collecting Tubule
- Normal
- Damaged

Liver Failure

• Yes!

Healthy Liver

Cirrhotic Liver

- Sclerosed liver
- Enlarged veins and arteries
What about Skin Failure

- Yes!

Skin Failure

- An event in which the skin and underlying tissue die due to the hypoperfusion that occurs concurrent with severe dysfunction or failure of other organ systems

  - (Langemo, 2005; Langemo & Brown, 2006)

SKIN: A Complex Multifunctional Organ

Largest organ in the body
- Comprises approx. 10% of body’s weight

Responsibilities include:
- Protective mechanical barrier
- Regulates temperature
- Prevents H2O loss
- Sensory perception
- Vitamin D production

Receives approximately 1/3 of the circulating blood volume

*Dependent on other organs for function
It requires approximately 25 – 33% of cardiac output to live.
Three types of Skin Failure

Skin failure has three types — acute, chronic and end-stage.

- **Acute**:
  - Common in hospital

- **Chronic & End-Stage**:
  - Most commonly found in long-term care facilities
  - All complicated by other organ dysfunctions!

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Three types of Skin Failure: **Acute**

Acute: "an event in which skin and underlying tissue die due to hypoperfusion concurrent with a critical illness"

- Sepsis, MI, or Stevens-Johnson Syndrome

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Three types of Skin Failure: **Chronic**

Chronic: "an event in which skin and underlying tissue die due to hypoperfusion with a chronic disease state"

- Neuropathy, PVD, DM
Three types of Skin Failure: End-Stage

End-Stage Skin Failure: “an event in which skin and underlying tissue die due to hypoperfusion concurrent with the end of life”

- Cancer or progressive multi-organ failure

The skin becomes more fragile when blood is directed away from the skin to help preserve more vital organs.

The natural challenge of aging!
Natural decrease in vascular perfusion
Decrease in subcutaneous fat
Thinner epidermis
As collagen and elastin decrease in presence and organization.
Skin Failure: A Codependent Disease

Retrospective study looked at ICU patients with skin failure (N=552)

5 most common diagnoses associated with skin failure:
1. PAD (vascular compromise)
2. Respiratory failure
3. Mechanical ventilation
4. Liver failure
5. Severe sepsis/septic shock

Pressure Wounds: General Definition

- A localized injury to the skin that results in areas of necrosis and/or ulceration where tissues are compressed between bony prominences and hard surfaces; they result from pressure alone or pressure in combination with friction, shearing forces, or both.

Statistics

1. An estimated over 2.5+ million patients in the US have pressure ulcers.
2. Incidence is highest in older patients
3. Especially those who are:
   - Hospitalized
   - Long-term care facilities
Risk Factors

- Aging increases risk
  * Thinning of the skin in part because of reduced subcutaneous fat
  * Decreased capillary blood flow.
- Immobility (due to stroke, sedation, or severe illness)
  * Can result in an inability to change position frequently
- Comorbidities increase risk further
  * Poor nutritional status, dehydration; renal failure;
  * Diabetes; and cardiovascular disease
- Cognitively impaired
- Medications (prolonged steroid use)
- Urinary and fecal incontinence

How Do Pressure Ulcers Occur?
How do pressure ulcers occur?

Obstruction of blood flow!

With Continuous Pressure, obstruction of blood flow, and/or Shearing Trauma, Ulcers Will Eventually Occur.
Pressure Injury: Updated Definition

• 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 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, co-morbidities and condition of the soft tissue.

Classification and Staging

• Pressure ulcers are classified by stages as defined by the National Pressure Ulcer Advisory Panel (NPUAP).

• Originally there were four stages (I-IV) but in February 2007 these stages were revised and two more categories were added, Deep Tissue Injury (DTI) and Unstageable.

• April, 2016 two additional stages (MDRPI & MMPI) were added and new modifications to the definitions occurred.

*Important Notes:

• The staging system, refers specifically the what visible and/or palpable level of tissue was damaged.
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.

**Healthy Intact Skin**

**Blanchable**

**Non-Blanchable**
Stage 1:

- Non-blanchable

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 (MARSI), or traumatic wounds (skin tears).

Stage 2
Stage 2: Blister? (Clear fluid/serum filled blister)

- Injury to the dermis
- Fluid accumulation under the epidermis
When the blister ruptures: Exposure of the dermis

Stage 2

Stage 3 Pressure Injury: Full-thickness skin loss

- 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 tunnelling 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 3

Stage 3 Pressure Injury: Full-thickness skin loss

- 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 tunnelling 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.

What parts of the body do not have subcutaneous fat?

The depth of a stage 3 pressure ulcer varies by anatomical location:
- The bridge of the nose
- Ear
- Occiput
- Elbow
- Malleolus

Do not have subcutaneous tissue!
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.
Unstageable

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 an ischemic limb or the heel(s) should not be removed.

Unstageable Covered With Slough And Necrotic Tissue

Unstageable Covered With Necrotic Tissue
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.
- 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.
Medical Device Related Pressure Injury/MDRPI:
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.
Until the cast comes off and you are able to clearly assess the wound, the site remains unstageable!

**Medical Device Related Pressure Injury (MDRPI)**

Previously Unstageable per MDS 3.0

Additional pressure injury Stages: **New**

**Mucosal Membrane Pressure Injury (MMPI):**
- Mucosal membrane pressure injury is found on mucous membranes with a history of a medical device in use at the location of the injury.
- Due to the anatomy of the tissue these injuries **cannot be staged.**
Prevention is key!

Skin Tears!
What is a Skin Tear?

- Skin Tear: A traumatic wound that often results from external friction and/or shearing forces (such as tape removal) that separate the epidermis from the dermis (partial thickness wound) or separate both the epidermis and dermis from the underlying structure (full thickness wound).

Risk Factors for skin tears:

- Age
- Skin Atrophy
- Dry skin
- Long term steroid use
- Previous trauma to the skin such as Ecchymosis
- Impaired vision
- Impaired mobility
- Poor nutrition
- Poor hydration
- Cognitive or sensory impairment
- Comorbidities: PVD, CAD, CVA
- Dependence on others for showering, dressing or transferring
- History of previous skin tears
- Progressive (chronic) skin failure!

Staging System for Skin Tears

1. *Payne Martin Classification System for Skin Tears
2. Skin Tear Audit Research (STAR)
1. Payne Martin Classification System for Skin Tears

Category 1: Skin Tear without tissue loss
- Linear and flap type skin tears:
  - Skin flap can be approximated so that no more than one millimeter of dermis is exposed.

Category 2: Skin Tear with partial tissue loss
- (Two Types)
  - Category 2a: Scant tissue loss.
    - Partial thickness in which 25% or less of the epidermal flap is lost and at least 75% or more of the dermis is covered by the flap.
  - Category 2b: Moderate to large tissue loss.
    - Partial thickness wound in which more than 25% of the epidermal flap is lost and more than 25% of the dermis is exposed.
Payne Martin Classification System for Skin Tears: Category 3: Skin Tear with complete tissue loss

Skin tears with complete tissue loss:
- Epidermal flap is absent.

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Thank you for your time!