WOUNDS AND SKIN CONDITIONS

Initial Management and Work up

Hiral Naik Gallimore, MD
Buchi Ogbuagu, MD
Vohra Wound Physicians
Objectives

1. Wound Etiology
2. Wound Nomenclature
3. Common Skin Conditions
Wound Etiology
Wound Etiology

○ Pressure
○ Vascular
○ Diabetic
○ Thermal

○ Neoplastic
○ Autoimmune
○ Infectious
○ Shearing
Pressure wounds
Pressure Wounds

Stage 1
- Both skin layers intact
- Non-blanching redness

Stage 2
- Only the epidermis is disrupted
- This wound is closed

Stage 3
- Skin is completely disrupted
- This wound is open

Stage 4
- Deeper structures are involved
- Muscle and bone mostly

Unstageable
- Wound prevents identifying tissue involvement
- Unstageable DTI vs necrosis
# Pressure Wound Pitfalls

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<thead>
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<tbody>
<tr>
<td><strong>01</strong></td>
<td><strong>Size</strong></td>
<td>Staging is not dependent on size, depth is what matters</td>
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<tr>
<td><strong>02</strong></td>
<td><strong>Necrosis</strong></td>
<td>Necrosis can only be present in stage 3, 4, and unstageable wounds</td>
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<tr>
<td><strong>03</strong></td>
<td><strong>Blisters</strong></td>
<td>Blood Filled: DTI Fluid Filled: Stage 2</td>
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<tr>
<td><strong>04</strong></td>
<td><strong>Scabbing</strong></td>
<td>Scabbing is dried fibrinous exudate and not part of staging</td>
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# Pressure Wound Documentation

<table>
<thead>
<tr>
<th>01</th>
<th>Staging</th>
<th>Wounds can only go from unstageable to staged</th>
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<tbody>
<tr>
<td>02</td>
<td>Acquired</td>
<td>There is no difference in staging for acquired versus admitted wounds</td>
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<tr>
<td>03</td>
<td>Recurrence</td>
<td>If a wound reopens it goes back to whatever it was staged at before</td>
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Friction/Shear Wounds

These are wounds that are the result of application of mechanical force parallel to the tissue.

**Friction**
- Occurs when it is applied from a surface external to the tissues (e.g., between sheets or rope and the skin).

**Shear**
- Between layers of tissues, separating the tissues from each other with downward pressure from body weight.

Both are a type of pressure injury and will soon be included under MDS pressure staging.
Moisture Associated Skin Damage (MASD)

- Presentations
  - Reddened, denuded skin in areas of moisture
  - Often painful, itchy (resulting in excoriation), macerated with intact or partial thickness skin defects

- Management
  - Regular toileting and hygiene
  - Cleanse using pH neutral products and avoid rubbing
  - Moisturize: emollient creams
  - Protect: barrier creams and ointments with zinc, petroleum, dimethicone
Vascular Wounds
Vascular wounds

- Arterial
- Venous
- Lymphedema
Vascular Wounds: Arterial Wounds

- End vessel disease resulting in ischemia in distal sites
- Usually present with eschar/necrosis
- Scant exudate
- Hyperemic advancing edges with healing often confused with infection
- Maintaining dry wound bed paramount in healing, infection control
Vascular Wounds: Arterial Wounds

- Refer out to Vascular Surgery:
  - Acute and/or rapidly progressive disease
  - Wet gangrene
- Refer for Wound Care Consult:
  - Stable disease with established non-invasive studies to determine extent of disease
- Initial Management:
  - Keep dry, try betadine
  - Monitor for rapid progression or infection
Vascular Wounds: Venous

- Location: Shins and medial malleoli
- Often shallow, but highly exudative
- Significant slough or necrosis burden
- Irregular edges
- Classic surrounding skin changes:
  - Varicosities
  - Edema
  - Hyperpigmentation
  - Hemosiderosis
  - Lipodermatosclerosis
Vascular Wounds: Venous

- Refer out to Vascular Surgery:
  - Evidence of worsening infection, sepsis
  - Evidence of mixed disease
- Refer for Wound Care Consult:
  - Stable wounds in need of debridement, exudate management
- Initial Management:
  - Manage drainage with absorbent dressings
  - Care plan for ongoing limb elevation
  - Manage underlying causes of venous insufficiency (CHF, ESRD, etc.)
Vascular Wounds: Lymphedema

- Darkened, scaly skin with hyperkeratosis, papillomatosis
- Wounds are highly exudative and shallow with slough and irregular borders
- Initial edema may be pitting but can become non-pitting
- Stemmer’s sign: Thickened fold of skin at base of second digit
Vascular Wounds: Lymphedema

- Refer out for:
  - Rarely emergent, but can develop secondary infections
  - Mixed disease - to Vascular Surgery

- Refer for Wound Care Consult:
  - Fluid management and infection prevention

- Management:
  - Control exudate with appropriate dressing
  - Skin care regimen for increase skin strength
  - PT consult would beneficial for manual lymphatic management, lymphedema wraps, exercising
  - Lymphedema specialist
Diabetic Wounds
Diabetic Wounds

- Often located on the soles of the feet
- Exudate may also be variable and related to circulatory status of the patient
- Often painless if neuropathy is present
- Variable in appearance
  - Calloused blisters
  - Open ulcers
  - Punched out edges
Diabetic Wounds

- Refer out for:
  - Evidence of acute osteomyelitis
  - Vascular consult if coexisting e/o arterial

- Refer for Wound Care Consult:
  - Serial debridements
  - To prevent/treat OM (pseudomonas infection)

- Management
  - Keep wounds clean and dry
  - Glycemic control
  - Offloading footwear
  - Routine foot care
Thermal Injuries
Thermal Injuries: Burns

1. **1st Degree**
   - Skin is red and painful, affecting only the epidermis with no blistering.

2. **2nd Degree**
   - Affects epidermis and part of the dermis. Affected skin is painful, swollen, blistering, red, and exudative.

3. **3rd Degree**
   - Affects the full depth of epidermis and dermis. Affected tissue is dark, with variable painless drainage and often painless. Leathery eschar usually present.
Thermal Injuries: Burns

● All burns must be reported to state
● When to refer out to the Evans-Haynes Burn Center at VCU
  ○ Large TBSA wounds
  ○ Burns involving joints, face, hands, perineum
  ○ Pain control
● When to refer for Wound Care Consult
  ○ For management of wounds that don’t require transfer to a burn center
  ○ Bedside debridement, infection prevention, appropriate documentation
● Management
  ○ Silvadene is not always indicated, santyl will address the necrosis better
  ○ May use other non-adherent dressing, silicone based foams as opposed to telfa.
  ○ Do not add thermal injury to thermal injury. Do not apply ice cold water.
Q&A
Wound Nomenclature
Wound Nomenclature: Maceration

- Softened tissue from prolonged exposure to moisture
  - Usually seen in the periwound area
  - Can worsen/enlarge wounds
- Can be caused by improper bathing techniques
- Can be treated with proper exudate management
Wound Nomenclature: Desiccation

- Dried out tissue
  - Usually noted in deeper, exposed structures: bone, tendon and muscle
- Can lead to necrosis and infection of affected tissue
- Must address moisture balance and protect this tissue
Wound Nomenclature: Necrosis

- Non-viable/dead tissue
- Dead is dead, can not become viable
- Must be removed to aid in wound healing and infection prevention
- Is a spectrum....

<table>
<thead>
<tr>
<th>Slough</th>
<th>Necrotic Tissue</th>
<th>Eschar</th>
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<tbody>
<tr>
<td>Wet</td>
<td>More dry</td>
<td>Dry, Leathery</td>
</tr>
<tr>
<td>Often white, pale yellow</td>
<td>Ranges from yellow to brown</td>
<td>Ranges from white to dark</td>
</tr>
<tr>
<td>Partially adherent</td>
<td>More adherent</td>
<td>Thickly adhered</td>
</tr>
<tr>
<td>Exposed tissue underneath can</td>
<td>Less painful</td>
<td>Least painful</td>
</tr>
<tr>
<td>cause pain</td>
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</table>
Wound Nomenclature: Slough
Wound Nomenclature: Necrotic Tissue
Wound Nomenclature: Eschar
<table>
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<th>WOUND NOMENCLATURE</th>
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<tr>
<td><strong>Scab</strong></td>
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<tr>
<td>Crusting over a wound consisting of dried blood, and fibrinous exudate</td>
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<tr>
<td><strong>Biofilm</strong></td>
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<td>Layer on the surface of chronic wounds containing clumps of bacterial cells embedded in a viscous, self-made, slimy, barrier composed of sugars and proteins</td>
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<tr>
<td><strong>Hyperemia</strong></td>
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<tr>
<td>Healthy redness of periwound associated with increased blood flow as part of the healing process</td>
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<tr>
<td><strong>Cellulitis</strong></td>
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<tr>
<td>Unhealthy redness of periwound associated with infection. Usually with warmth, edema, pain and a spreading nature</td>
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Skin Conditions
Autoimmune Wounds
Autoimmune: Pyoderma Gangrenosum

- **Presentation**
  - Painful chronic ulcers often with purple borders, locations are variable
  - Moderate drainage and slough burden
  - Worsens with debridement

- **Associated with other inflammatory disorders**
  - Peristomal in UC patients

- **Diagnosis of exclusion**
  - Biopsy doesn’t rule it out, but in

- **Treatment:**
  - Anti-inflammatory medications
  - Pain management
  - Monoclonal Antibodies
Autoimmune: Bullous Pemphigoid

● Presentation
  ○ Blistering disease that can be itchy or painful
  ○ Affects flexural areas, and possibly mucous membranes
  ○ Common in patients > 60 yo

● Diagnosis
  ○ Biopsy and immunofluorescence

● Treatment
  ○ First line: Tetracyclines
  ○ Second line: Steroids
  ○ Blisters: Supportive care, keep blisters intact and manage weeping
Infectious Wounds
Infection: Abscess

- **Presentation**
  - Localized pus collection 2/2 SubQ infection
  - Painful, warm, red, fluctuant or indurated mass, +/- purulent drainage
  - Many names: boils, pimple, furuncle, carbuncle

- **Treatment**
  - Warm/moist compress to bring to a head
  - I & D can be done at the bedside
  - Incision large enough to allow for packing
  - Source control more important than empiric PO/IV antibiotics
  - Send out for signs of sepsis, pain control, rapid spread
Infections: Cellulitis

- **Presentation**
  - Bacterial infection of SubQ/Skin
  - Signs: pain, swelling, redness, warmth, spread

- **Diagnosis**
  - Culture, deep wound vs surface swab

- **Treatment**
  - Avoid empiric antibiotics to provide good antibiotic stewardship
  - Topical antibiotics have better penetrance than IV or PO
  - Source control is paramount
  - For rapidly evolving/progressing disease consider Necrotizing Fasciitis
Infection: Necrotizing Fasciitis

- **Presentation**
  - Rapidly spreading bacterial soft tissue infection
  - Crepitus: SubQ air production
  - Rapidly progresses to SIRS
  - Higher risk amongst the immunocompromised

- **Treatment**
  - Refer immediately for surgical and possible ICU intervention
Infection: Hidradenitis Suppurativa

- Presentation:
  - Chronic infection of areas containing prolific hair follicles and apocrine glands (axilla, groin)
  - Usually with multiple, painful nodules, pustules and interconnected sinuses
  - Foul smelling exudate complicated by atrophic and hypertrophic scars
  - High incidence of Strep and Staph species

- Treatment:
  - Gold Standard: En bloc excision
  - Supportive care: good hygiene, pain and infection control with wound care and empathy
Neoplastic Wounds
Neoplastic: Basal Cell Carcinoma

- **Presentation:**
  - Pearly pink papules with raised edges (rodent ulcer)
  - Patients > 60 yo
  - Local involvement more likely than distant metastasis

- **Treatment:**
  - Biopsy at bedside
  - Refer for Mohs procedure
  - Alternatively, local destruction by cautery, ablation etc
Neoplastic: Bowen’s Disease

- **Presentation:**
  - Red, scaly patch of skin
  - Squamous carcinoma in situ

- **Treatment:**
  - Should be excised in appropriate patients
  - Excision can be done at the bedside

Photo provided by Dr. Richard P. Usatine, usatinemedia.com
Neoplastic: Squamous Cell Carcinoma

- **Presentation**
  - Reddish-brown ulceration
  - Papulonodular, erythematous, indurated
  - Quick to bleed

- **Risk Factors**
  - History of chronic wound or injury
  - Most common lesion associated with sun exposure

- **Treatment**
  - Bedside biopsy can be done
  - Refer for excision for appropriate patients
  - Conservative management with ablation, cautery or topical agents in all others
Neoplastic: Marjolin’s Ulcer

- **Etiology**: malignant change, to SCC, in a chronic ulcer

- **Presentation**
  - 2% of chronic wounds
  - Usually in scars, burns, sinus tracts, chronic OM
  - Variable latency period (from 1 to 11 years)
  - More common in lower extremity wounds
  - Appearance is nodular, indurated with rolled over or everted edges and a fungating base
  - Quick to bleed with copious, foul smelling exudate, similar to SCC

- **Treatment**
  - Control exudate and infection
  - Biopsy at bedside
  - Refer for excision/Mohs procedure in appropriate patients
Neoplastic: Melanoma

- Presentation: ABCDE
  - **A**symmetry of outline
  - **B**orders may be irregular
  - **C**olor change
  - **D**iameter increases
  - **E**levation

- Risk Factors:
  - More common with fairer skin that is more likely to sunburn
  - *Amelanotic lesions are often diagnosed late (raised, pink, purple or skin colored)*

- Treatment:
  - Refer for appropriate staging and intervention which can include excision, lymph node exploration
  - Consideration of patient’s overall status is paramount
Actinic Keratosis

- **Presentation:**
  - Rough, scaly patches on skin
  - Usually on sun exposed areas
  - Might be precancerous

- **Treatment:**
  - Biopsy and observation
Seborrheic Keratosis

- **Presentation:**
  - Waxy, scaly, elevated lesion
  - Black, brown or tan color
  - Painless
  - Non-malignant
- **Treatment:**
  - Biopsy and observation
Common Skin Conditions
Common Skin Conditions: Xerosis

- Dry, flaky skin often found in the elderly
  - At risk because of the loss of SQ fat and thinning skin
  - Prevent dehydration
  - Routine hygiene and showers
  - MOISTURIZE!
Common Skin Conditions: Skin Tears

- Separation in layers of skin as a result of application of a physical force (e.g. friction, shear forces)
  - Light non-adherent wound dressing
  - Avoid over wrapping with gauze bandage
  - Avoid excessive coverage with steri-strips

- Star Classifications
  - 1 - No skin loss
  - 2 - Partial flap loss
  - 3 - Total flap loss

- For at risk patient
  - Geri-sleeves
  - Encourage hydration
  - Routine hygiene and moisturizing
  - Bubble wrap
References

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- Schwartz Principles of Surgery
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- "File:Marjolin ulcer 01.jpg" by Kuebi is licensed under CC BY 2.0
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- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4692953/
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