

Wound Care Management- Pressure Injuries

Japa Volchok, DO
Wound Care Specialist
jvolchok@vohraphysicians.com

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Disclosure

Dr. Volchok is the Vice President of Operations for Vohra Wound Physicians Management, LLC a national physician management organization serving wound physicians and their patients across the country. Dr. Volchok has no ownership or financial interest in any products or devices discussed.

Dr. Volchok has supported this presentation with the best evidence available in the relevant medical literature.

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Why is this Relevant?

- How will I use the information in this presentation to help my member?
 - I will better understand how pressure ulcers develop
 - I will recognize the risk factors in the development of pressure injuries and the impact social factors have on healing wounds
 - I will recognize the common stages of pressure injuries
 - I will better understand risk factors and medications that delay healing
 - I will understand what kinds of local wound treatment options are available and when to refer to specialty care
 - I will review ways to prevent hospitalization and ER visits for wounds and recognize when to warn members of worsening of their wound

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NPUAP 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 or other device. The injury can present as intact skin or an open ulcer..."

National Pressure Ulcer Advisory Panel (NPUAP)

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Why do pressure ulcers develop?

Extrinsic

- NPUAP guideline states: "Pressure ulcers develop as a result of the internal response to external mechanical load."

*In other words....*Too much pressure causes decreased blood flow to an area of tissue, depriving that tissue of oxygen and nutrients, which causes that tissue to be injured/die

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Why do pressure ulcers develop?

Intrinsic

- Age
- Functional Status, SDoH
- Nutrition
- Previous history of pressure ulcers
- Medical comorbidities (ex. CHF, ESRD, DM, COPD)
- Medications

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Functional Status, SDoH

- Mobility
- Strength
- Sensation
- Support system (Involved, capable family member/care giver)
- Nutrition, hydration
- Access to specialty physicians and nurses

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Co-morbidities
are a two-way
street

- Circulation, oxygenation,
waste management, and
chemical balance

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Medications

- Anticoagulants
 - Thrombin inhibitors
- Nicotine
 - Vasconstricts, hypercoagulation of platelets
- Colchicine
 - Inhibits wound remodeling
- Dakins
 - Above ¼ strength 0.025% inhibit fibroblasts



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Medications

- ACE Inhibitors
 - Impair collagen
- Steroids
 - Decrease growth factors
- Methotrexate
 - Inhibits DNA, cell growth
- NSAIDS
 - Interferes with granulocytes



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Thrombin (factor IIa)

- Hemostasis or clotting involves forming a fibrin plug. Thrombin is essential for this to occur. Thrombin also provides growth factor that promote the formation of new collagen and blood vessels.

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Anticoagulants

| Ok for wounds | Bad for wounds |
|---------------|----------------|
| Xa Inhibitors | Coumandin |
| | Heparin |
| | LMWH |
| | Hirudins |

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Pressure Ulcer Prevention Strategies

Pressure Offloading

- Keep the heels off the bed!
 - Use pillows, wedges, boots with heel cutouts
- Reposition/turn patients q2h
 - Limit lateral rotation to <30 degrees to avoid pressure on the greater trochanter
- Use pillows or wedges to separate bony prominences

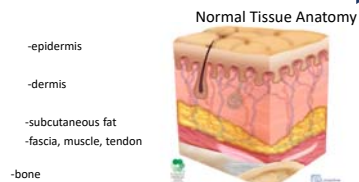
Use Pressure relieving devices/surfaces

- Low air loss mattress
- Seat cushions
- Boots

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The Language of Pressure Ulcers

How we describe what level of tissue has been destroyed



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The Language of Pressure Ulcers

Necrotic Tissue

- Necrotic Tissue:
 - Dead, devitalized tissue due to reduced blood supply
 - Usually yellow, gray, brown



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The Language of Pressure Ulcers Eschar

- Eschar:
 - Necrotic tissue that has become dry
 - Thick, hard, leathery, black or brown



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The Language of Pressure Ulcers Slough

- Slough:
 - Necrotic/avascular tissue that has a stringy or mucinous consistency
 - Usually yellow or tan



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The Language of Pressure Ulcers Granulation

- Granulation:
 - vascularized connective tissue that serves as a scaffold for re-epithelialization
 - may be red, pink, or pale/dusky red, bumpy/pebbly



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The Language of Pressure Ulcers Epithelial Tissue

- Epithelial Tissue:
 - New skin cells that migrate across the wound surface
 - Pale pink/white, very delicate and fragile



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Staging of Pressure Ulcers: What level of tissue has been destroyed?

- Stage I
- Stage II
- Stage III
- Stage IV
- Unstageable
- DTI (Deep Tissue Injury)

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Pressure Ulcer Staging Stage I

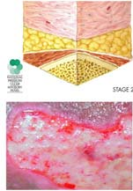
Stage I: non-blanchable erythema of intact skin (skin is red with no break in the skin)



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Pressure Ulcer Staging Stage II

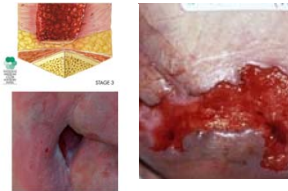
Stage II: partial-thickness skin loss with exposed dermis (has NO slough or eschar)
(May also present as a fluid-filled or ruptured blister)



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Pressure Ulcer Staging Stage III

Stage III: full thickness skin loss in which subcutaneous tissue is exposed
(may see slough, necrotic tissue, or granulation tissue)



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Pressure Ulcer Staging Stage IV

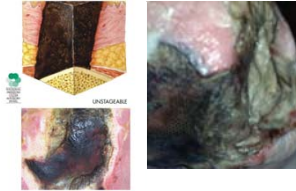
Stage IV: full thickness skin and tissue loss
(exposed/palpable muscle, tendon, bone)



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Pressure Ulcer Staging Unstageable

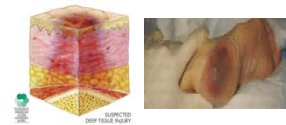
Unstageable: obscured full-thickness skin and tissue loss (cannot see base of wound due to slough/eschar)



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Pressure Ulcer Staging DTI

DTI: persistent nonblanchable deep red, maroon, or purple discoloration



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Local Wound Care: General Principles

- Which treatment is appropriate is determined by the condition of the wound bed and the surrounding tissue
- Optimal wound healing takes place in a *moist* wound environment
 - Epithelial cells require moisture to migrate from the wound edges and to resurface/re-epithelialize the wound

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Local Wound Care: General Principles

- In other words: Use the right product on the right wound at the right time:
 - If the wound is too dry→moisten it
 - If the wound is too wet→absorb it
 - If the wound has necrotic tissue→debride it
 - If the wound has a cavity→fill it

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Local Wound Care Treatment Options by Mechanism of Action

- Moisture Donating
 - Hydrogel
 - Xeroform
 - Adaptic
- Moisture Absorbing
 - Calcium Alginate
 - Foam
 - Collagen

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Local Wound Care Treatment Options by Mechanism of Action

- Debriding Agents
 - Surgical/Sharp debridement
 - *To cut is to cure...*
 - Mechanical
 - W to D, whirlpool
 - Enzymatic
 - santyl
 - Autolytic
 - honey

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Local Wound Care Treatment Options by Stage

- Stage I
 - Pelvic/trunk areas:
 - Barrier creams
 - Offload the wound
 - Heels:
 - Skin prep
 - Betadine
 - Offload the wound

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Local Wound Care Treatment Options by Stage

- Stage II: Offload the wound
 - Pelvic/trunk areas:
 - Barrier creams
 - Foam
 - hydrocolloid
 - Heels:
 - Intact blister: skin prep/betadine
 - Ruptured blister:
 - Light exudate: collagen sheet
 - Moderate/heavy exudate: Calcium alginate
 - Dry: xeroform, petroleum gauze

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Local Wound Care Treatment Options by Stage

- Stage III/IV: Offload the wound!!
 - With necrosis:
 - Santyl + calcium alginate
 - Honey alginate
 - Moderate/heavy drainage:
 - Calcium alginate, foam
 - Light drainage
 - Gauze
 - Dry:
 - Hydrogel
 - Xeroform
 - Infected:
 - Silver alginate
 - Dakins

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Local Wound Care Treatment Options by Stage

- DTI: Offload the wound!!
 - Pelvic/trunk areas:
 - Barrier cream
 - Foam
 - Heels:
 - Skin prep
 - Betadine

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Warning Signs

- Signs and symptoms of infection (redness, odor, drainage, increased size of wound, fever)
- Failure of wound to decrease in size by 10 % over 30 days
- Increasing size of wound
- New wounds
- Re-opening of wounds
- Loss of appetite
- Tachycardia, changes in BP in quadriplegics
- Increased levels of blood glucose in diabetics (not explained by patient baseline)

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Preventing decline and admission or ER use

- Healing or Palliation what is the goal?
- Keep wound free of necrosis to prevent infection
- Manage exudate (timely and proper dressings)
- Manage off-loading
- Monitor size of wound and changes in wound character
- Early access to wound physicians into the home (virtual or in person)

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When to refer?

- Wounds that have failed to improve in 30 days
- New wounds or re-opening in a formerly stable patient
- Stage 3 or 4 wounds without a comprehensive physician wound assessment in past 3 months
- Deterioration or other warning signs

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Resources to consider

1. In-home specialty physician care (virtual or in-person)
2. Wound Care Center
3. General/Plastic Surgery Clinic
4. Certified Wound Care Nurse
5. Home Health Nurse
6. Family Members
7. Wound care dressing management (DME)

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Summary

- Pressure injuries develop from external factors and are impacted by internal factors
- A patient's social environment, access to care, co-morbidities, and social support system are critical to wound healing.
- Wound Management is a complex and under served area of medicine
- Resources are available to manage patients at home and avoid ER and hospital visits
- Warning signs that patients should watch for: development of new wounds, failure of wounds to heal, increased size of wounds, drainage, odor

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