FR15- Navigating the Turbulent Waters of Wound Care

Friday, March 23
1:30 PM- 3:00 PM

Session Description

This session will provide an update on the current practice guidelines and recommendations for delivery of wound care in the post-acute setting. Various etiologies, assessment, and treatments will be discussed. Additionally, information on the development of a wound care team and establishing a center of excellence in wound management will be addressed.

Learning Objectives

Understand various wound types and classifications.
Recognize the importance of correct etiology identification.
Identify various roles of the wound care team.

Presenter(s): Shark Bird, MD, CMD; Aaron Blom, DO, MBA; Scott Bolhack, MD, MBA, CMD; James Kramer, MD; Karl Steinberg, MD, HMDC, CMD

Presenter(s) Disclosures: All speakers have reported they have no relevant financial relationships to disclose.
Navigating the Turbulent Waters of Wound Care

Scott Bolhack, MD
Karl Steinberg, MD
Shark Bird, MD
Aaron Blom, DO
James Kramer, MD

Staging of Wounds Due to Pressure

Scott Matthew Bolhack, MD, MBA, CMD, CWSP, FACP

Speaker Disclosures

Dr. Bolhack has no financial relationship(s).

Nomenclature

a. Ischemia Ulcer
b. Pressure sore
c. Pressure Necrosis
d. Bed Sores
e. Decubitus Ulcer
f. Pressure Ulcer
g. Pressure Injury
What are the Mechanisms of Injury?

- An area of localized soft tissue ischemic necrosis caused by prolonged pressure that was higher than the capillary pressure
  - Necrosis, then cell death after a certain critical duration or critical pressure
  - Anoxia, then cell death after a certain critical duration or critical pressure
- Reperfusion
  - Response to damage with an influx of chemicals creating an inflammatory, destructive process
- Tissue Deformation
  - A sudden (or persistent) shearing
  - If at the muscle/bone interface (sacrum, coccyx), then Deep Tissue Pressure Injury

When all else fails...

- Describe what you see anatomically!
- Epidermis
  - 75-150 microns except soles/palms .4-.6mm
- Dermis
  - Average 2mm; 2-4mm thick
- Subcutaneous (Highly Variable)
- Muscle, Tendon, Ligament, Bone (Variable)

Classification of Wounds Caused by Pressure

- NPUAP
- EPAUP
  - Category
  - Grade
- ICD-11
  - Will include ulcer and injury as synonyms
  - https://idc.who.int/icd11-

Stage One

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 Two

- **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 deep tissue is not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and sheath in the skin over the pelvis and sheath 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, burns, abrasions).

Stage Three

- **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 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 Four

- **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 Pressure Injury

- **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.

Deep Tissue Pressure Injury

- **Deep Tissue Pressure Injury: 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

- **Medical Device Related Pressure Injury**
  This is 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.
Mucosal Membrane Pressure Injury

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 ulcers cannot be staged.

Other Fun Facts

- Wound on the heel of a diabetic is a pressure injury if the causative etiology is pressure
- Slough and Granulation tissue are not found in a Stage 2 Pressure Injury
- A non-avoidable pressure injury (vs. avoidable one) is not related to how ill the patient is, but to whether you have appropriately assessed the risk, initiated interventions, reevaluated those interventions, and monitored the resident
- The Stages of Pressure Injuries are **NOT** meant to reflect a progression of insult
- The Stages reflect a combination of anatomy of the soft tissue structure and causative insult

Validated Tools for Monitoring

- PUSH Tool (Pressure Ulcer Scale for Healing)
- NPUAP
- BWAT (Bates-Jensen Wound Assessment Tool)
- Design-R
  - Japan
Regulatory & Risk Management Considerations

Karl E. Steinberg, MD, CMD, HMDC
Chief Medical Officer, Mariner Health Care
E-mail: KarlSteinberg@MAIL.com
Twitter: @karlsteinberg

2016: NPUAP changes nomenclature from pressure ulcer to pressure injury
Various reasons; skin sometimes intact, etc.
“Injury” has a particular connotation in litigation
AMDA Resolution I-17 passed last year opposing formal changes (ICD-10, other classification systems)
AMA followed suit with Resolution H70.913 (2017)
Language is Important

- Skin failure in context of multi-system organ failure
- Colonization vs. infection
- Don’t call non-pressure wounds pressure wounds
  - But also don’t call pressure wounds non-pressure wounds!
- "Unavoidable" ulcers

Unavoidable (CMS definition)

**Unavoidable** means that the resident developed a pressure ulcer even though the facility had:
- evaluated the resident’s clinical condition and pressure ulcer risk factors;
- defined and implemented interventions that are consistent with resident needs, goals, and recognized standards of practice;
- monitored and evaluated the impact of the interventions; and
- revised the approaches as appropriate.

You have to do **all** of this. If not, considered **avoidable**.

Quality Measures

- LTC (Custodial, Long-Stay): High-Risk Residents with Pressure Ulcers
  - National Average 6.2%
- Post-Acute (Skilled, Short-Stay): Residents with New or Worsened Pressure Ulcers
  - Risk-Adjusted
  - National Average 1.0% as of Jan. 2017
  - Doesn’t take much to flag on this!

Relevant Regulations & F-Tags

**AMDA Advice to Attending Physicians on F686:**
- Identify and address risk factors, including medical comorbidities and medication-related adverse consequences, for development or impaired healing of pressure ulcers.
- Order appropriate preventive and treatment measures. For more complicated or poorly healing wounds, review with staff whether the care plan for managing these patients addresses key issues.
- Document appropriate medical explanations for the development of pressure ulcers or worsening of pressure ulcers in individuals, especially where healing was anticipated.
- Follow the status of existing pressure ulcers until resolved.
- Periodically evaluate in more depth patients with complex, non-healing, or recurrent ulcers.

Relevant Regulations & F-Tags

**Relevant Regulations & F-Tags**

- Quality of care; §483.25
  - F-Tag 684 (previous F309)
  - Includes non-pressure wounds, end-of-life care, pain.
  - A resident [approaching the end of life] must receive, and the facility must provide, the necessary care and services to attain or maintain his/her highest practicable level of physical, mental, and psychosocial well-being, in accordance with the comprehensive assessment and plan of care.
  - Palliative care (wound care and/or overall care) and hospice referrals should be considered and documented when appropriate.
  - Goals of care discussed and addressed (ACP, F578).
Relevant Regulations & F-Tags

- Quality of care; §483.25,F684 (continued)
- When there has been a lack of improvement or a decline, considered unavoidable when
- An accurate and complete assessment (see §483.20);
- A care plan that is implemented consistently and based on information from the assessment; and
- Evaluation of the results of the interventions and revising the interventions as necessary.
- AMDA advice to attending physicians:
  - Use of specific medical conditions and symptoms are being monitored and addressed appropriately
  - Evaluate the results of the interventions and revising the interventions as necessary.

Other Nuances

- Patient repositions self on back, or rubs heels on mattress causing shear
- Consider additional interventions; document each episode and be sure family is aware
- It looks bad when a wound is DTI or unstageable at the time of first identification—ensure frequent, diligent skin checks
- Much easier to heal a stage 1-2 ulcer promptly
- Assisted Living: Know the regulations in your state as to admission/retention regulations with skin breakdown

Communication

- Create realistic expectations!
- Let patients/families know that skin breakdown sometimes occurs with good care—before it actually happens, ideally
- Discuss & document goals of care, including goals for wound healing, pain control, odor control, etc.

Take-Home Messages

- Not all PUs are avoidable, but many are
- Even with a perfect chart (which doesn’t exist), a negligence case against a nursing home can succeed
- Think twice about photographing wounds
- Document, document, document
- Do good risk assessment and check skin often
- The physician should examine the skin with reasonable frequency, even if others are providing direct care
- Forging good relationships with patients/families, attention to comfort, good advance care planning, and creating realistic expectations can go a long way

Thank You!

Wound Rounds and Assessments

Shark Bird, MD, CMD, CWSP
Disclosures

- No financial relationships with any pharmaceutical companies
- CMO for Vohra Wound Physicians

The Interdisciplinary Team

- Certified Nursing Assistant
- Medical Assistant
- Wound Care Nurse
- Unit/Floor Nurse
- Physician
- Maintenance Staff
- Physical/Occupational Therapist
- Administrator

Quality Assurance Performance Improvement (QAPI)

- Measuring compliance with quality standards
- Continuously enhancing processes to prevent or decrease problems

Wound Care Rounds

- To be done weekly
- Appropriate team members present
- Assessment and measurements
- Involve families and patients
- Prepare accordingly

Wound Assessment

- Various methods in assessing wounds
- Document: length, width, depth, tissue type, exudate, odor, periwound description
- Wound improvement is to be expected
- Document reasons for lack of wound improvement

Pressure ulcer wound

LCD Determinations

- LCD is guidance by a MAC on the coverage of a particular service on a MAC-wide basis
- Documentation needed for wound care reimbursement
- Drainage, inflammation, swelling, pain, dimensions, necrosis or slough
Wound Measurements

Length = 13.3mm
Width = 15.2mm

202.16 sq mm
20.22 sq cm

Wound Measurements

Length 5.1mm
Width 2.4mm

Length 7.6mm
Width 2.6mm

12.24
19.76
Photo Assisted Measurements

- Can be both helpful and/or inflammatory
- Requires special training and equipment
- May remove individual bias
- Surface area calculations may differ from L x W standard
- Large wounds may not be visualized in a flat 2-dimensional photo (ex: circumference of the leg wound)

Pressure Ulcer Scale for Healing (PUSH) Tool

Overview of Vascular Ulcers

- Arterial Ulcers
- Venous Ulcers
- Diabetic Ulcers
- Neuropathic Ulcers
### Overview – Lower Leg Ulcer Etiology

- Venous insufficiency *80-85%*
- Arterial insufficiency
- Mixed Arterial/Venous
- Diabetic/Neuropathic
- Autoimmune
- Lymphedema
- Other/Malignancy

### Scope

- Ulcers of the lower extremities are a common cause for visits to the podiatrist, wound care specialist, primary care physician and vascular surgeon
- Majority of vascular ulcers are chronic/recurrent
- Morbidity among patients with PAD/DM including work incapacity
- The care of chronic vascular ulcers places a significant burden on the patient and the health care system
- Additionally, these non-healing ulcers place the patient at much higher risk for lower extremity amputation

### Etiology

- When an ulcer does not respond to appropriate medical/wound care, the potential for an underlying malignancy should be considered
- Cutaneous malignancies that may masquerade as ulcers include nodulo-ulcerative basal cell carcinoma, squamous cell carcinoma, keratoacanthoma, nodular melanoma, tumor stage mycosis fungoides, lymphomatoid granulomatosis, angiosarcoma, and cutaneous metastases from internal malignancy
- Healthcare providers must recognize these presentations and render appropriate therapeutic intervention
- PERFORM A WOUND BIOPSY

### Pathophysiology

- Arterial/ischemic ulceration can be caused by either progressive atherosclerosis or arterial embolization
- Both lead to ischemia of the skin and ulceration

### Pathophysiology

- Two hypotheses have been proposed to explain venous ulceration:
  - Hypertensive distention of the capillary beds occurs because of increased stasis
  - This leads to leakage of fibrinogen into the surrounding dermis
  - Over time, a fibrinous pericapillary cuff is formed, impeding the delivery of oxygen and other nutrients or growth factors to the affected tissue
  - Results in hypoxic injury leads to fibrosis and then ulceration

- Endothelium is damaged by increased venous pressure and leukocyte activation
- Proteolytic enzymes and free radicals are released
- Escape through the leaky vessel walls, and damage the surrounding tissue
- Leads to injury and ulceration
Pathophysiology

- Diabetic ulcerations occur as a result of various factors
- Mechanical changes in conformation of the bony architecture of the foot
- Nonenzymatic glycosylation predisposes ligaments to stiffness
- Neuropathy causes loss of protective sensation and loss of coordination of muscle groups in the foot and leg, both of which increase mechanical stresses during ambulation leading to ulcer formation

Arterial Ulcers

- Arterial ulceration typically occurs over the toes, heels, and bony prominences of the foot
- The ulcer appears “punched out,” with well demarcated edges and a pale, non-granulating, often necrotic base
- The surrounding skin may exhibit dusky erythema and may be cool to touch, hairless, thin, and brittle, with a shiny texture
- The toenails thicken and become opaque and may be lost
- Gangrene of the extremities may also occur
- Examination of the arterial system may show a decreased or absent pulse in the dorsalis pedis and posterior tibial arteries
- There may be bruits in the proximal leg arteries, indicating the presence of atherosclerosis

Arterial Ulcers

- Increasing the peripheral blood flow via reconstructive surgery or angioplasty is the intervention most likely to affect the healing process in arterial ulceration
- Operative indications for chronic ischemia include non-healing ulceration, gangrene, rest pain, and progression of disabling claudication
- The patient should stop smoking, strict glycemic control, hypertension, and hyperlipidemia should be optimized
- Local direct wound care to control infection and necrotic burden
Venous Ulcers

- 95% of venous ulceration is in the gaiter area of the leg, characteristically around the malleoli
- Ulceration may be discrete or circumferential
- The ulcer bed is often covered with a fibrinous layer mixed with granulation tissue, surrounded by an irregular, gently sloping edge
- Ulcers occurring above the mid-calf or on the foot are likely to have other origins

Venous Ulcers

- Pitting edema is often present and may predate the ulcer
- Often worse towards the end of the day
- Extravasation of erythrocytes into the skin occurs, resulting in the deposition of hemosiderin within macrophages, which stimulates melanin production, pigmenting the skin brown

Venous Ulcers

- Compression is the mainstay of venous ulcer management (and elevation)
- Graded compression, with greatest pressure at the ankle, tapering off to lower pressure below the knee, increases the limb hydrostatic pressure and concomitantly reduces the superficial venous pressure
- Various compression bandage systems are used
  - These include the single and multilayer elastic bandage systems, short stretch bandage, and elasticated tubular bandages
  - Compression with pneumatic devices has been used to promote healing of venous ulcers in patients with edematous legs

Venous Ulcers

- Local wound care/debridement is essential to promote and maintain healing (warm moist wound environment)
- Once the venous ulcer has healed, it is essential that therapy is continued in order to prevent ulcer recurrence
- This includes wearing compression stockings (medical grade), skin care, leg elevation, calf exercises
Diabetic Ulcers

- The etiologies of diabetic ulceration include neuropathy, arterial disease, pressure, and foot deformity.
- Diabetic peripheral neuropathy is present in 60% of diabetic persons and 80% of diabetic persons with foot ulcers, and confers the greatest risk of foot ulceration.
- Microvascular disease and suboptimal glycemic control contribute to the formation of diabetic ulcers.

Diabetic Ulcers

- Diabetic ulcers tend to occur in the following areas:
  - Areas of weight bearing, such as the heel, plantar metatarsal head areas, the tips of the most prominent toes and the tips of hammer toes.
  - Ulcers also occur over the malleoli because these areas commonly are subjected to trauma.
- Other physical findings include the following:
  - Hypertrophic calluses
  - Brittle nails
  - Hammer toes
  - Fissures

Diabetic Ulcers

- The management of diabetic foot ulcers requires offloading the wound using appropriate therapeutic footwear and/or TCC devices.
- Daily dressings to provide a warm moist wound environment.
- Sharp debridement when necessary.
- Antibiotic therapy if osteomyelitis or cellulitis is present.
- Optimal control of blood glucose.
- Evaluation and correction of peripheral arterial insufficiency.
- Immediate smoking cessation.

Neuropathic Ulcers

- Neuropathic is a secondary complication that occurs from a triad of disorders, including peripheral vascular disease, peripheral neuropathy, and infection.
- They are most commonly associated with diabetes.
- Neurotrophic ulcers typically form on the plantar aspect of the foot at areas of excessive focal pressures - most commonly the bony prominences of the metatarsal heads and forefoot region.
- Loss of protective sensation in the foot can lead rapidly to ulceration if patient education and preventive measures are not taken.
Neuropathic Ulcers

- Offloading the wound using appropriate therapeutic footwear and/or TGC devices
- Daily dressings to provide a warm moist wound environment
- Sharp debridement when necessary
- Antibiotic therapy if osteomyelitis or cellulitis is present
- Optimal control of blood glucose
- Evaluation and correction of peripheral arterial insufficiency
- Immediate smoking cessation

Take Home Points

- Circulation, Circulation, Circulation!!
- Handheld doppler
- Low threshold to perform wound biopsy
- Remove necrotic burden
- Provide warm moist wound environment to promote healing

Reasons for Debridement
Reasons for Debridement

- Removal of necrotic/non-viable tissue
- Prevent nidus of infection
- Possible un-roofing of any closed space/abscess

Reason for Debridement

Best Interval for Debridement

- James Wilcox et al studied 312,744 wounds over a 4 year period
- Wounds consisted of DFUs, VLUs, and pressure injuries
- *JAMA Dermatol.* 2013;149(9):1050-1058.

Best Interval for Debridement (All Types)

Best Interval for Debridement (DFUs)
Best Method for Debridement

- Surgical
- Curettage
- Hydrosurgery
- Biologic
- Mechanical
- Enzymatic
- Autolytic

Surgical
- Ability to debride to viable tissue
- Ability to stimulate bleeding
- Instant disruption of biofilm
- Tissue culture
- Tissue biopsy

Decision to Debride
- Pain
- Environment
- Choice and Consent
- Co-morbidities
- Quality of Life
- Skill level
- Regulations
When is a Wound Infected?

When is a wound colonized?

What is Critical Colonization?

Critical Colonization

• Indolent wound not responsive to appropriate therapy
• No cellulitis but new or increasing pain
• Thick slough resistant to removal
• Slough returns rapidly after adequate debridement
• Intermittent odor

To swab or not to swab?

When do we treat?

• Dolor
• Tumor
• Calor
• Rubor
• Functio laesa
When do we treat?
- Abnormal or excessive granulation
- Bleeding from fragile wound surface
- Increasing pain
- Persistent odor
- Bridging and pocketing of purulent material
- Delayed Healing

When do we start topical antibiotics?

Stewardship
- Optimization of therapy for individual patient
- Prevention of antibiotic overuse, misuse, and abuse
- Minimization of development of resistance in all care environments
- Thereby improving patient safety and outcomes

Antimicrobials

When to consider systemic therapy?
- Increasing bioburden
- Cellulitis
- Lymphangitis or lymphadenopathy
- Osteomyelitis
- Bacteremia
- Life-threatening sepsis, pending shock
- Large numbers of pathogens
- Immunocompromised host

AMDA Template
- a.Infection Preventionist (IP) (required)
- b.Director or Assistant Director of Nursing
- c.Medical Director or a designated physician (required)
- d.Consulting and/or Dispensing Pharmacist (required)
- e.Administrator
- f.Attending Physician or Nurse Practitioner or Physician Assistant
- g.Nurse
- h.Nurse Aide
- i.Allied Health Professional
- j.Representative from the Resident and Family Council
What is the ultimate goal?