ACUTE AND CHRONIC WOUND MANAGEMENT
Vohra Wound Care Certification Course

Disclaimer:
This presentation is for informational purposes only. Every patient and medical situation is unique, and medical decisions should be based on standard of care and medical practices. Views expressed in this presentation are the sole opinion of the presenter.

- **ANATOMY OF SKIN** (and underlying structures important in classification of pressure wounds)
  - Skin is one of the largest organ of the body (by weight exceeded only by the musculo-skeletal system and by surface area only by the lungs and GI tract)
  - Protective function
    - Envelopes the body, packages organs and controls fluids
    - Barrier to noxious substances
  - Like any organ, skin is subject to injury and failure
  - Layers of soft tissue (from outer-most layer)¹
    - Skin
      - Epidermis
        - keratinocytes
        - minimal blood supply
        - cells that have migrated up from the base
      - Dermis
        - hair follicles
        - sebaceous glands
        - nerve endings
        - blood vessels
    - Subcutaneous tissue
      - beneath full thickness of skin
      - contains fat
    - Fascia and Muscle
      - Fascia – white glistening layer that covers muscle
      - Muscle
    - Bone
• **WOUNDS**
  o Result from interruption in one or more layers of skin and underlying structures
  o Categories considered
    - Pressure
    - Arterial
    - Venous
    - Diabetic Neuropathic Ulcers
    - Surgical (dehiscence or other complication)

• **PRESSURE ULCERS**
  o 4 Stages
    - Stage 1 = redness ("non-blanching erythema")\(^3\)
      only, skin intact
      - different from Deep Tissue Injury (DTI)
        which is deeper and more severe injury and distinct from Stage 1
      - early recognition and treatment essential to prevent deeper extension

    - Stage 2 = damage to skin (epidermis, or epidermis and dermis), but not involving subcutaneous layer\(^4\)
      - often epidermis will separate from the underlying dermis and form blister, may open and expose the dermis
      - no slough or necrosis
        - slough or necrosis implies at least Stage 3 wound
        - per National Pressure Ulcer Advisory Panel (NPUAP)

    - Stage 3 = full-thickness dermal injury into subcutaneous tissue\(^5\)
      - much more significant damage to skin
      - involves epidermis, dermis, subcutaneous tissue
      - does not extend to supporting structures below
Stage 4 = wound extends into supporting structures (fascia, muscle, ligament, tendon, bone) 6
• most severe damage to skin
• depending on location, ranging from relatively simple and not deep (for example, fascia exposed on a finger joint) to complicated and deep (for example, bone exposed over sacrum)
• involves all layers of skin and underlying structures down to and including underlying fascia and muscle or other supporting structures, even extending into bone

Unstageable 7
• cannot visualize wound bed for any reason
• do not assign stage number until full extent of damage known
• wound may be obscured by eschar, necrotic tissue, device, etc.

• ARTERIAL ULCERS 8
  o Non-pressure-related interruption or obstruction to blood flow
    ▪ Ischemia (lack of blood flow) from Pressure Ulcer results from compression of tissue by body weight between support surface and bone
    ▪ Ischemia from Arterial Ulcer results from interruption more proximal to wound
  o Characteristics:
    ▪ typical locations – distal portion of lower extremity:
      • ankle
      • top of foot
      • toes
    ▪ wound bed usually dry and pale
    ▪ minimal exudate
  o Signs of decreased blood flow:
    ▪ intermittent claudication (pain with walking, relieved by rest)
    ▪ absence of pedal pulses (dorsalis pedis and posterior tibial)
    ▪ pain on elevation of affected site above level of heart
- site cool to touch
- decreased capillary refill (prolonged return of color after blanching with finger pressure)
  - normal 3 seconds or less
  - greater than 4 seconds implies arterial disease

- **VENOUS ULCERS**
  - Impaired return of blood from the periphery back to the heart
  - **Primary causes:**
    - venous hypertension from compromised venous valves
      - leaky valves that interferes with unidirectional flow of venous blood back to the heart
      - blood pools in lower extremities, resulting in venous hypertension
      - blood begins to exude through vein walls into soft tissues, leading to a skin blister(s) that open and leads to a wound
    - partial or complete obstruction of venous system
      - for example, as from a DVT (deep vein thrombosis)
      - same process of venous hypertension (see above)
    - calf muscle pump failure
      - normally, calf muscles contract with use (walking) and squeeze/push venous blood up toward the heart
      - without calf muscle contraction (for example, in paralysis or other non-ambulatory conditions), venous blood pools in the lower extremities, as above
  - **Characteristics:**
    - typical location in pretibial area
    - wound bed moist and granulating
      - minimal to copious exudate
      - pain in dependent position

- **NEUROPATHIC ULCERS**
  - Caused by repetitive trauma, unrecognized from impaired sensation (neuropathy)
  - Most common in diabetes because of:
    - peripheral neuropathy
    - angiopathy (disease of small arteries)
Characteristics
- Most often occur on ball of foot over metatarsal heads or top of toes
  - Ill-fitting shoes a leading cause
- Resemble arterial ulcers
  - Frequently infected
- Requires diagnosis of neuropathy, most typically diabetic
- Sometimes accompanied by foot deformity
  - Loss of autonomic tone which holds shape of foot with arch
  - Loss of arch, foot resembles rocker bottom → Charcot's foot

**SURGICAL WOUNDS**

- Healing by "primary intention"
  - Clean wound
  - Margins approximated (by sutures or tape strips)
  - Minimal or no drainage
- Healing by "secondary intention"
  - When breakdown occurs
  - Surgeon should be notified to:
    - Rule out infection
    - Decide whether to open wound (remove sutures) for healing from inside out ("secondary intention")
- Signs of concern:
  - Lack of healing
  - Increased erythema around wound
  - Increased or purulent (pus) drainage
  - Wound separation ("dehiscence"), even if sutures remain present
  - Increased pain

**STATE SURVEYS**

- Evaluation
  - Determine whether care is appropriate
  - Determine whether care commensurate with CMS contract for which payment received
- Annual survey
  - 3-month survey window
Future
  - outcomes-based payment?

Documentation

Other State Survey triggers
  - complaint
  - evidence of improper care

**LITIGATION**
- Often occurs as a result of inadequate or improper communication
  - set realistic goals and expectations
  - communicate these to the patient and the family
  - most conflicts arise at all levels because of a difference in expectations

- Family members should be included in care plan
  - invite family members to rounds

- Proper documentation of conversation with patient and family is key

- Early recognition of change in patient status, problem with current management, wound complication, etc. and intervention with appropriate care is essential

**MODERN WOUND MANAGEMENT**
- Moist wound bed healing
  - based on scientific data, not tradition
  - for example, wounds should not be left open to air (and outside contamination, including flies → maggots)

- Debridement (removal of necrotic or dead tissue)
  - sharp (most effective, but sometimes contraindicated)
    - coagulopathy (for example, from anticoagulant therapy)
    - ischemia
    - pain
    - patient refusal
    - etc.
  - enzymatic (collagenase / Santyl)

- Frequency of dressing changes
  - minimize to decrease nursing care and patient inconvenience
  - dressings may require changes daily, every few days, even weekly
- Control of exudate
  - promotes wound healing by achieving proper moisture balance
  - reduces risk of infection
  - decreases periwound maceration

- Control of odor

- Nutrition
  - adequate protein stores is essential for wound healing
  - assess serum albumin or prealbumin
  - refer to Dietician when indicated
REFERENCES


   http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/

   Braden scale


   http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/


   http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/

   D.J. Yastrub, "Relationship Between Type of Treatment and Degree of Wound Healing Among Institutionalized Geriatric Patients with Stage II Pressure Ulcers," *Clinical Excellence for Nurse Practitioners*, 9 (2005): 89-94.


   http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/

   http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/


   http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-ulcer-stagescategories/


   A. Coull, D. Tolson, and J. McIntosh, "Class-3c Compression Bandaging for Venous Ulcers: Comparison of Spiral and Figure-of-Eight Techniques," *Journal of Advanced Nursing, 54*: 274-283.


   http://www.colorado.gov/cs/Satellite/CDPHE-HF/CBON/1251590938309
