

## **CHAPTER 14**

### **PRESSURE INJURIES**

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#### **I. TERMS**

- A. "Pressure injury" is now preferred over "pressure/decubitus ulcer" or "bed sore"
- B. Decubitus was a term to describe lying position; however, any position that causes sustained pressure to an area (e.g., sitting/side position) can cause a pressure injury. They can also occur due to casting or splinting after surgical procedures.

#### **II. STAGING SYSTEM**

- A. Stage I: non-blanchable erythema of intact skin
- B. Stage II: partial thickness skin loss with exposed dermis
- C. Stage III: full thickness skin loss
- D. Stage IV: full thickness skin and tissue loss with exposed fascia, muscle, tendon, ligament, cartilage, or bone
- E. Unstageable: full thickness skin and tissue loss in which the extent of tissue damage cannot be determined because it is obscured by slough or eschar
- F. Deep tissue injury: persistent non-blanchable deep red, maroon, or purple discoloration

#### **III. "ICEBERG PHENOMENON"**

- A. Since skin can withstand ischemia much better than fat or muscle, a small skin wound on surface can reflect a large amount of deeper tissue necrosis underneath.

#### **IV. EPIDEMIOLOGY**

- A. Quadraplegics: 60%
- B. Bed-bound hospital patients: 10-15%
- C. ICU patients: 33%
- D. Hip fracture patients: up to 66%

#### **V. COST**

- A. 5-11.6 billion dollars in annual healthcare costs
- B. Additional \$7,000-43,000 dollars per hospital stay

- C. \$21,000-152,000 to treat/heal per pressure injury
- D. Medicare is primary payer for ~75% of hospitalizations with pressure injury

## **VI. AFFECTED BODY AREAS**

- A. Most common (order varies in literature): ischium, sacrum/coccyx, trochanter, heel
- B. Other sites: occipital region, malleoli, spine, shoulder/scapula
- C. Spinal cord injury patients: sacrum (acute), ischium (chronic)

## **VII. RISK FACTORS**

- A. Extrinsic: nonphysiologic, environmental
  1. Pressure (perpendicular) leads to deep necrosis: can develop after 2 hours of unrelieved pressure
  2. Shear (parallel) leads to superficial necrosis
  3. Friction
  4. Moisture
- B. Intrinsic: physiologic
  1. Altered activity/mobility
  2. Cognitive deficit or altered consciousness
  3. Decreased autonomic control (e.g., incontinence)
  4. Infection → sepsis/ischemia
  5. Increased age
  6. Sensory loss
  7. Chronic illness: vascular disease/anemia
  8. Malnutrition
  9. Medications/immunocompromised (e.g., steroids)
- C. Braden scale: measures pressure injury risk for adults/children using 6 domains (sensory perception, moisture, activity, mobility, nutrition, and friction/shear)

## **VIII. NON-SURGICAL TREATMENT**

- A. Prevention is the best treatment
  1. Keep skin clean and dry
  2. Appropriate nursing care, including turning the patient every 2 hours (avoid dragging/shearing skin of the patient while repositioning)
  3. Optimizing nutrition
  4. Relieving pressure using air mattresses, cushions, heel protectors
  5. Air fluidized beds (Clinitron®) gold standard for pressure injury prevention
- B. Systemic infection/sepsis unlikely with pressure injury (unless immunocompromised): look for other source, e.g., urinary tract infection or respiratory tract when patients with pressure injuries present with fevers
- C. If localized infection is present (look for signs of local cellulitis) topical antimicrobial agents (Silvadene, Sulfamylon) can be used

- D. Bone biopsy best method to assess osteomyelitis versus osteitis
- E. Can direct antibiotic therapy to treat osteomyelitis, but virtually impossible to eradicate infection with antibiotics alone
  - 1. MRI may be helpful as imaging study, while bone scans are often nonspecific due to presence of periostitis associated with open wounds
  - 2. Long term antibiotics are not indicated
  - 3. Pressure injury closure may be accelerated using topical protein growth factors
  - 4. Stage III-IV patients require sharp debridement, highly absorptive dressings (alginates, hydrocolloid beads, foams, hydrogels)
  - 5. VAC therapy may be beneficial to assist closure

## **IX. SURGICAL TREATMENT**

- A. Due to high recurrence rates, surgery tends to be reserved for patients with reversible pathologies
- B. Patient motivation is an important determinant of recurrence risk in the alert patient
- C. Excisional debridement of pressure injury and bursa and any heterotopic calcification
- D. Partial or complete ostectomy to reduce bony prominence – may lead to new pressure injuries elsewhere (be careful when off-loading)
- E. Closure of the wound with healthy, durable tissue that can provide adequate padding over the bony prominence (myocutaneous vs. fasciocutaneous flap)
- F. Aftercare including appropriate surfaces and wound management are paramount
- G. Lifestyle and activity modification often required in order to reduce recurrence risk

## **REFERENCES**

1. “National Pressure Ulcer Advisory Panel (NPUAP) Announces a Change in Terminology from Pressure Ulcer to Pressure Injury and Updates the Stages of Pressure Injury.” National Pressure Ulcer Advisory Panel, 13 April. 2016. <http://www.npuap.org/national-pressure-ulcer-advisory-panel-npuap-announces-a-change-in-terminology-from-pressure-ulcer-to-pressure-injury-and-updates-the-stages-of-pressure-injury>. Accessed 10/12/17.
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3. Janis JE, O’Reilly EB. “Pressure Sores.” *Essentials of Plastic Surgery*, 2nd Edition. Ed. Jeffrey E. Janis. Boca Raton: CRC Press, 2014. 641-650. Print.