

Preventing Pressure Ulcers on the Heels: Separating Fact from Fiction



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Definition

- ▶ A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear. A number of contributing or confounding factors are also associated with pressure ulcers, the significance of these factors is yet to be elucidated. NPUAP, 2009



- ▶ *Friction is gone as an etiology*

Fact or fiction?

- ▶ The new cases of pressure ulcers on the heels are higher than pressure ulcers on the sacrum.
- ▶ True or False

Fact or Fiction:

The Braden score is the most accurate method to predict pressure ulcers on the heels.

Braden scores

- ▶ Most common Braden was 17 in patients who develop heel ulcers (Bergquist, 2011)
- ▶ Braden ranged 7–23 in patients with heel ulcers (McElhinny, 2008)
- ▶ Braden range was 13.44 +/- 3.25 (Clegg, 2009)
- ▶ Braden Range was 15–18 (Walsh, 2007)

- ▶ Why does it not predict?
 - Role of arterial disease/perfusion
 - Role of neuropathy
 - Role of immobility/weakness of one limb

Universal Patient Risk Factors for Heel Ulcers

- ▶ **Immobility**
 - Leg
 - Whole Body
 - Short and long term
- ▶ **Neuropathic Disease**
 - Lack of usual cues to move
- ▶ **Arterial Inflow Disease**
 - Lack of usual reactive hyperemia
- Malnutrition –weakness
- End stage renal disease
- Systemic infection
 - Ischemic tissue prone to infection
 - Shunting to maintain BP



Campbell, 2010; Clegg, 2009; Edwards, 2006; Lyman, 2009; Okura, 2006; Senturan, 2009

Shear and Friction are Secondary Factors

- ▶ Heel trapped on bed as patient slides down
 - Hammock effect
- ▶ Agitated or confused patients rubbing their heels or digging in to the bed



Fact or Fiction Hip surgery is a common cause of pressure ulcers on the heels

Risk factors due to treatments

- ▶ Epidural analgesia
 - Leg immobility and numbness
 - 13.8 of 29 patients developed heel ulcers (Battersby, 2011)
- ▶ Orthopedic surgery for hip fracture
 - Cumulative incidence was 17%
 - All ulcers found on admission to rehab
 - 41% were DTI or unstageable (Campbell, 2010)

Adding to Braden for Heel Ulcers

- ▶ Does the patient *move legs* independently?
- ▶ Does the patient have normal or delayed *capillary refill*? Palpable *pulses*?
- ▶ Does the patient have normal *sensation*?
- ▶ Does the patient wear TEDs?



When these factors are present... patients are at risk

Fact or Fiction You don't need to remove TEDs or SCDs to assess for heel ulcers



The nurse must constantly evaluate the effectiveness of her actions. This nurse is examining the patient's heel to make sure the skin is not showing signs of pressure

Assessment of the heel has long been a nursing role— but you have to look and not feel for stage 1s

Skin inspection....can we talk?



You cannot feel a stage I or DTI pressure ulcer and you can't see them through stockings

How can the first citation of a pressure ulcer on the heels be a stage III or IV?

Fact or fiction? Pillows can be used for heel elevation for all patients

Treatment of At Risk Patients

- ▶ Heel elevation from the bed with pillow **if bedrest short-term**
 - Pillows do not work for long term prevention (Heyeman, 2009)
- ▶ Boots if bedrest long term
 - Over 6 hours
 - (Cuddigan, 2009)



When using boots for elevation



- Still require skin assessment
 - Ulcers on dorsal foot from straps
 - Skin breakdown from seams
- Check fit of boot
 - If foot is touching boot, there is no pressure relief at that point



← Foam boots can adhere to bed linens

Preventing Friction Injury

- ▶ Dressings on heel
 - Clear film dressings work, but can harm the skin when removed
 - Hydrocolloid OK
 - Foam OK
- ▶ Sleeves



Boots that allow the heel to touch the bed do not prevent pressure

Treatment of Heel Ulcers



Pressure Ulcer



- ▶ Risk factors
 - Leg immobility
 - Consider restraints, devices, limb weakness
 - Interface pressure in foot portion of beds
 - Neuropathy
 - Often combined with immobility

Fact or fiction?

- ▶ It is acceptable to classify a foot wound as a diabetic foot ulcer if the patient is diabetic regardless of the etiology.

Pressure in a Neuropathic Foot



- ▶ DM accelerates arteriosclerosis
- ▶ DM leads to neuropathy with loss of protective awareness
- ▶ Ulcers usually from footwear

Pressure ulcer on the heel of a DM, looks the same

Pressure Ulcers in Ischemic Disease



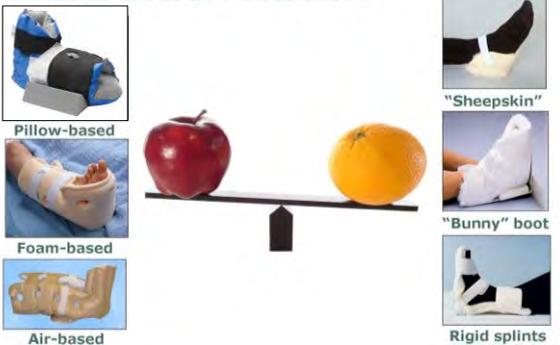
- ▶ *Ischemic limbs at higher risk*
 - Delayed reperfusion of loaded tissue
 - ▶ History of arterial diseases
 - ▶ Role of limb contracture
- Pressure ulcers in ischemic limbs look the same

Traumatic Injury



- ▶ Wheel chair injury
 - ▶ Friction/agitation
 - ▶ Dragging foot on floor
 - ▶ Direct trauma
 - Lawn mower injury
- Pressure ulcers from traumatic injury look the same as other pressure ulcers

What is a Heel Protector?



Cuddigan, Janet E., Elizabeth A. Ayello, and Joyce Brook. "Saving heels in critically ill patients." *JWOC* 28.2 (2008): Print.

Treating at Risk Heels

- ▶ Boggy or true Stage I
 - Stage as Stage I
 - Elevate heels
 - Flex knee gatch to reduce hammock effect
 - Granulex?
 - Water filled gloves? (Adejumo, 2010)
 - Clinical issues with pressure relief
 - Abduction pillows with hip replacement
 - Buck's traction



Evidence from clinical trials

- ▶ Clinical trials in high risk patients
 - ▶ Heels suspended from bed with device to prevent foot drop (Cadue, 2008)
 - ▶ Decreased number of heel ulcers ($p < 0.0001$)
 - ▶ Delayed onset of 5.6 days to 2.8 days ($p = 0.01$)
 - ▶ Heels treated with a wedge-shaped cushion compared to standard pillow (Heyenman, 2009)
 - ▶ Fewer ulcers developed with wedge ($p = 0.02$)
 - ▶ Delayed onset of 4 days to 3.5 days ($p = NS$)
 - ▶ Heels elevated in Prevalon boots (Lyman, 2009)
 - ▶ Reduction in heel ulcers from 2.1–5% fell to 0–3.2%
 - ▶ 39 ulcers before to 2 ulcers after boot used
 - ▶ Heels elevated on standard pillow or air filled heel device (Tymec, 1997)
 - ▶ No differences in ulcer incidence

Fact or fiction?

- ▶ Deep tissue pressure ulcers on the heels are one of the most common pressure ulcers present on admission to long term care.

Deep Tissue Injury of the Heel



Note the epidermal lifting



Note early blood blister forming

Treating Deep Tissue Injury

- ▶ Immediate, constant pressure relief
 - Use Boots
- ▶ If tissue intact, protect it with nonadhesive dressings and wraps
- ▶ Monitor for skin opening
 - Look for drainage on linens, dressings
- ▶ Monitor for deterioration
 - Erythema, fever, pain, odor
- Treat with MIST



Evidence

- ▶ Black, unpublished
 - Outcomes of DTI included sepsis, amputation, colostomy as well as resolution
- ▶ Baharestani, unpublished
 - 100 cases of DTI; 36% resolved with offloading
- ▶ Research is needed
 - Nebraska protocol has been to offload heel DTI with heel boots and we have resolved almost all cases to the zone of infarct only
- ▶ Use of MIST Ultrasonic Therapy
 - Case controlled series showed improved outcomes of DTI (faster resolution, less progression) Honaker, 2011

Fact or fiction?

- ▶ Eschar on heels should be debrided.

Treating (or not treating) Stable Eschar

- ▶ Characteristics
 - Intact, hard eschar
 - Normal, non-fluctuant surrounding tissue
 - No pain in wound
 - No drainage
 - No odor
- ▶ Leave this skin intact
 - **There is nothing underneath it!**
 - Trim as it sloughs



Evidence

- ▶ Débride stable eschar?
 - Evidence from vascular surgery on dry gangrene
 - Some clinicians questioning the rationale of leaving it intact
 - No formal evidence (eg RCT) to test
 - Years of clinical evidence seeing débrided patients over time lose legs following debridement in ischemic limbs
- ▶ Débride unstable eschar and necrotic tissue
 - Based on principles of surgery
 - RCTs would be unethical

Treating Stage II Heel Ulcers

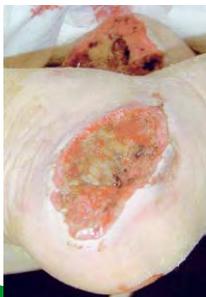
- ▶ Blister Protection
 - Offloading
 - Dressings? Or topicals?
 - No shoes that rub
- ▶ Open ulcers
 - Hydrocolloids, gels, honey, foams effective
 - Offloading



Evidence

- ▶ Open wounds need moisture to heal, dry desiccated tissue does not heal
 - However, too much moisture can also macerate the wound bed or the periwound tissue
- ▶ Heels are difficult to dress due to anatomy
- ▶ Ischemic limbs are slow to heal

Treating Open Heel Ulcers



- ▶ Stage III ulcers
 - Protective dressings if clean
 - Hydrocolloids OK
 - Hydrogels OK
 - Alginates OK if draining
 - Débride slough
 - Enzymes OK
 - Honey being used
 - Monitor for deterioration
 - Increasing size
 - Increasing pain
 - Odor
 - Exposure of bone/tendon
 - Fever, change in LOC

Treating Unstageable Heel Ulcers

- If invasive infection unroof and expose wound
 - use empiric antibiotics, then based on tissue cultures
 - consider arterial inflow
- If slough/eschar is soft but wound is stable, débride with
 - Enzymatic/maggot/honey
 - Silver for short time to control bacterial growth



Treatment of Stage IV Heel Ulcers

- ▶ Pack the wound bed
 - Absorptive dressings or packing
 - Silver or honey helpful
 - Silvadene
- ▶ Monitor for osteomyelitis
 - If you can feel or see bone, osteomyelitis is likely present



Evidence

- ▶ Surgical principles for removal of necrotic tissue
- ▶ Diagnosis of osteomyelitis
 - Plain film vs MRI
- ▶ Infectious disease principles on treatment of osteomyelitis
- ▶ Little to no evidence on medical management of stage IV heel ulcers

Evidence

- ▶ Industry sponsored study of enzymatic and water-knife forms of debridement
- ▶ No evidence on efficacy of sharp debridement
- ▶ Risk of cross-contamination with submersion tanking
- ▶ Honey very effective antimicrobial (Gunes, 2007)
- ▶ Maggots effective
- ▶ Silver effective --- some resistance beginning
- ▶ Wet to dry detrimental to healing tissue
 - Role with biofilm management?
- ▶ Maintenance débridement?



Evidence on Nutrition for Heel Ulcers

- ▶ None directly
- ▶ Evidence on the role of hydration in improving perfusion of tissues (Wong & Stotts)
- ▶ Some evidence on nutrition for venous ulcers



Fact or fiction?

- ▶ Almost all heel ulcers go on to heal.



Outcomes of heel ulcers

- ▶ Retrospective review of 57 LTC cases (Han, 2011)
 - All patients had LE contracture
 - Calcaneotomy
 - 43 had partial
 - 9 had total
 - 5 had total and removal of talus
 - Complete healing in 58%
 - Persistent infection or recurrence in 42%



Summary

- ▶ **An ounce of prevention is worth a pound of cure**
- ▶ Heel ulcers can heal
 - Often slowly
 - Prone to osteo
 - May require to amputation





Questions?
