

Pressure Ulcers on the Heels

Joyce M. Black, PhD, RN
University of Nebraska
College of Nursing
Past President, NPUAP

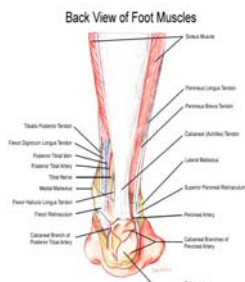
How common are heel ulcers?

- ▶ Second most common site (sacrum is most common)
 - Heel ulcers (All ulcers including stage I)
 - 23.7% of acute care ulcers (sacrum 28.9%)
 - 22.5% of LTAC ulcers (sacrum 28.3%)
 - 22.9% of LTC ulcers (sacrum 23%)
- ▶ However, heels are highest incident ulcers!
 - Incident (agency acquired)
 - 26.1% of acute care ulcers (sacrum 27.1%)
 - 23.6% of LTAC ulcers (sacrum 18.2%)
 - 24.5% of LTC ulcers (sacrum 15.0%)

Data from VanGilder (2008), N = 85,838

Tissue Risk Factors Seen in the Heel

- ▶ Anatomical Variance
 - Posterior prominence of the calcaneus
 - Lack of subcutaneous tissue



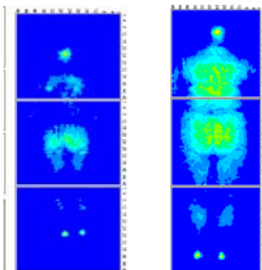
Patient Risk factors for Heel Ulcers

- ▶ Neuropathic Disease
 - Lack of usual cues to move
- ▶ Arterial Inflow Disease
 - Lack of usual reactive hyperemia
- ▶ **Immobility**
 - Leg
 - Whole Body
 - Short and long term



Pressure is the Primary Cause

- ▶ Intense pressure? Vs lower level pressure?
- ▶ Immobile, confined (restraints, devices)
- ▶ Interface pressure in foot portion of beds
- ▶ In the obese, adipose tissue does not equal padding



BMI = 22 BMI = 42

Shear and Friction are Secondary Factors

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

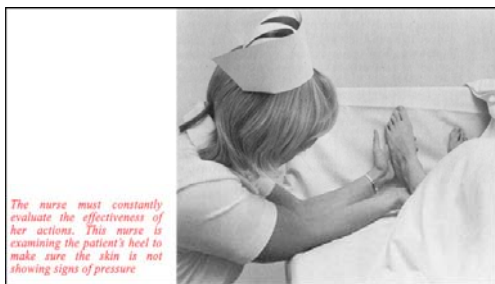


Identify Risk for Heel Ulcers

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



All patients should be screened for risk daily



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

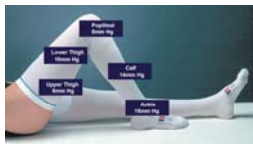
Assessment of the heel has long been a nursing role—but you have to look and not feel for stage 1s

Skin inspection....can we talk?



You cannot feel a stage 1 or DTI pressure ulcer and you can't see them through stockings

TED Stockings



- ▶ Originally designed for people at bedrest with even pressure throughout.
 - Now some gradient from maximum of 18 mmHg at heel less to thigh
- ▶ Evidence on reducing incidence of DVT (Joanna Briggs, 2008)
- ▶ Reinforcement at heel puts extra pressure on heel
- ▶ Knee high equally effective
- ▶ **MUST BE REMOVED** for a period of time each shift

Are TEDs leading to "TedSores"?

- ▶ When stockings are not removed twice daily
 - Ulcers can develop
- ▶ When stockings are applied to legs with poor perfusion
 - Ulcers can develop



Treatment of At Risk Patients

- ▶ Heel elevation from the bed with pillow **if bedrest short term**
- ▶ Boots if bedrest long term



What is a Heel Protector?

Pillow-based

Foam-based

Air-based

"Sheepskin"

"Bunny" boot

Rigid splints

Coddigan, Janet E., Elizabeth A. Ayello, and Joyce Brand. "Saving heels III @BSGally III patients." JHEC 7.2.2 (2008). Print.

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

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

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

Treating at Risk Heels

- ▶ Boggy or true Stage I
 - Stage as Stage I
 - Elevate heels
 - Buck's traction
 - Flex knee gatch
 - Intense pressure relief
 - Abduction pillows with hip replacement
 - Check fit of TEDs
 - Remove BID
 - Granulex?



Deep Tissue Injury of the Heel



Note the epidermal lifting



Note early blood blister forming

Evidence

- ▶ Evidence on the effect of pressure on skin
- ▶ No published interventional work on stage I prevention or management
 - Could we count facilities that have sustained low numbers of PrU or PrU of only stage I as evidence?

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



Treating the Thin Blister Stage

- ▶ Continued elevation
- ▶ Monitor skin beneath blister, but leave in place if area stable
- ▶ Dress with nonadhesive products
- ▶ Boots are likely needed



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

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

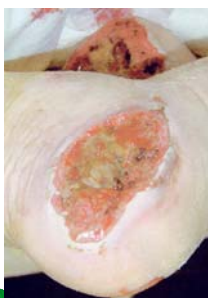
- ▶ Blister Protection
 - Elevation
 - Dressings? Or topicals?
 - No shoes that rub
- ▶ Open ulcers
 - Hydrocolloids, foams effective
 - Elevation



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
 - Débride slough
 - Enzymes OK
 - Papain urea off the market
 - Monitor for deterioration
 - Increasing size
 - Increasing pain
 - Odor
 - Exposure of bone/tendon
 - Fever, change in LOC

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

Treating Unstageable Heel Ulcers

- If infected, débride quickly
- If invasive infection unroof and expose wound
 - use empiric antibiotics, then based on tissue cultures
- ▶ If slough/eschar
 - Enzymatic/maggot/honey
 - débridement effective
 - continue to monitor for infection



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

Summary

- ▶ Heel ulcers can heal
 - Often slowly
 - Prone to osteo
 - May require to amputation
- ▶ Much easier to prevent

