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Preventing Heel Pressure Injuries: The Clinical and Economic Value of Heel Offloading Devices

Executive Summary

Heel pressure injuries (HPIs) are among the most preventable yet prevalent forms of hospital-acquired conditions, contributing to increased morbidity, extended lengths of stay, and rising healthcare costs. The heel is especially vulnerable due to its anatomical prominence and minimal soft tissue padding. This paper reviews the clinical evidence supporting heel offloading devices (HODs) as a best-practice intervention, compares their efficacy against standard practices such as repositioning and pillow elevation, and provides guidance on which patient populations benefit most from their use. For clinical leaders, wound care teams, and value analysis committees, the findings offer clear direction on implementing HODs as part of a facility-wide pressure injury prevention strategy.

Clinical Background

Pressure injuries affect over 2.5 million U.S. patients annually, costing the healthcare system an estimated \$9.1 to \$11.6 billion each year. HPIs, which can progress rapidly from Stage 1 to deeper tissue injuries, are common in patients with immobility, vascular insufficiency, or critical illness. The heel's unique anatomy—comprised of a thin dermal layer over a calcaneal prominence—makes it particularly susceptible to ischemia during sustained pressure.

Traditional interventions, including repositioning schedules and the use of bed pillows, have shown inconsistent effectiveness in eliminating heel pressure. Bed pillows, though inexpensive and accessible, often fail to maintain heel suspension, can displace easily, and do not distribute pressure evenly across the leg. Heel offloading devices are designed specifically to eliminate pressure at the heel, mitigate shear, and maintain optimal limb positioning, thereby addressing the limitations of standard approaches.

Evidence Supporting Heel Offloading Devices

A 2022 systematic review by Greenwood et al. (*Journal of Tissue Viability*) evaluated 15 randomized controlled trials and found that heel offloading devices reduced the risk of developing Category 2 or greater pressure injuries by over 90% compared to standard care (RR 0.08; 95% CI: 0.01–0.67). Facilities that integrated heel boots and suspension devices into their protocols saw significant reductions in injury rates.

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Similarly, a 2015 study by Griffin et al. (Open Journal of Nursing) reported that acute care units using heel offloading boots had a 75% reduction in new pressure ulcer formation compared to units using repositioning and pillows alone.

The limitations of pillow elevation are well-documented. A 2017 evidence summary by Haesler (Wound Practice and Research) found that pillows often do not fully offload the heel and can inadvertently create high-pressure areas on the Achilles tendon or lateral malleolus. In contrast, structured devices maintained consistent heel suspension and better redistributed pressure over the calf.

Patient Populations Best Suited for Heel Offloading Devices

Not all patients require heel offloading devices, but certain high-risk groups derive substantial benefit from their routine use. The following populations should be prioritized:

1. Immobile or Bedbound Patients

- Patients unable to independently reposition themselves every 2 hours
- Post-operative patients in orthopedic, cardiac, or neurological recovery units
- ICU patients sedated, intubated, or receiving paralytic agents

2. Patients with Peripheral Arterial Disease or Diabetes

- These populations have impaired microcirculation, reducing tissue tolerance to pressure
- Diabetic patients are also at increased risk due to peripheral neuropathy, which impairs pain and pressure sensation

3. Elderly or Frail Adults

- Aging skin has diminished elasticity and subcutaneous fat, increasing vulnerability
- Long-term care or skilled nursing residents are particularly at risk

4. Patients with History of Pressure Injuries

- Recurrence is common in previously affected sites
- These patients often require enhanced monitoring and targeted preventive measures

5. Patients with Lower Limb Orthopedic Devices or Casting

- Immobilization from braces, splints, or casts can increase pressure on the heel
- Offloading devices can protect surrounding tissue from device-induced injuries

6. Patients on Vasopressors or With Hypoperfusion

- Reduced blood flow to extremities from pharmacologic or pathologic causes increases risk

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of tissue breakdown

Use Cases and Clinical Integration

Heel offloading devices can be integrated into the patient care plan through several use cases:

- Prophylactic Use: Upon admission for high-risk patients, particularly those expected to remain in bed >12 hours/day.
- Post-Surgical Recovery: For orthopedic or vascular procedures involving the lower limbs.
- Critical Care Protocols: Standard inclusion in ICU bundles for patients on ventilators or sedatives.
- Rehabilitation Settings: Where movement is limited and focus is on wound healing and pressure redistribution.
- Wound Prevention Bundles: Integrated with nutrition, moisture management, and mobility interventions.

Devices should be paired with routine skin assessments, with documentation at least once per shift, and checked for correct placement, skin contact, and any signs of device-related pressure or irritation.

Financial and Clinical Value Considerations

While heel offloading devices cost more than improvised solutions like pillows, their use is justified by the high cost of treating Stage 3 or 4 pressure injuries—estimated between \$20,000 to \$50,000 per injury. Moreover, CMS no longer reimburses hospitals for hospital-acquired pressure injuries (HAPIs), making prevention a financial imperative.

Benefits of HOD adoption include:

- Reduced HAPI incidence
- Shorter lengths of stay
- Higher patient safety and satisfaction scores
- Improved regulatory performance (e.g., HACRP, Leapfrog, Joint Commission)

Clinical teams conducting value analysis should factor in injury risk reduction, staff compliance, and downstream cost savings from avoided complications.

Conclusion

Heel pressure injuries are preventable with the consistent application of evidence-based

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interventions. Heel offloading devices have been shown through multiple high-quality studies to significantly reduce the risk of Stage 1–3 pressure ulcers compared to no intervention and to commonly used alternatives such as pillows. The integration of these devices into standard nursing protocols is essential for enhancing patient care, reducing avoidable complications, and achieving value-based care objectives.

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