

The Importance of Offloading Diabetic Foot Ulcers

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Polyneuropathy, peripheral arterial disease, structural foot deformities, repetitive micro-trauma, and elevated plantar pressure are all risk factors that contribute to the development of diabetic plantar ulcers.

The gold standard for diabetic foot ulcer treatment includes debridement of non-viable tissue, management of infection, revascularization procedures if indicated, controlling blood sugar, proper nutrition, and offloading the ulcer. Adjunctive therapies have also been useful, such as hyperbaric oxygen therapy, advanced wound care products, and negative-pressure wound therapy.

In this brief excerpt I'm going to focus on *some* of the different types of offloading options and devices—

- **Strict Non-Weightbearing.** Crutches, walkers, and wheelchairs are devices to aid in non-weightbearing; however patients with weak upper body strength may have difficulty using them, and may lead to non-compliance.
- **Foam/Felt Padding.** An opening can be cut in the material that is slightly larger than the size of the wound and added either directly to the patient's foot or into their shoe to offload the wound.
- **L'Nard Splint/Offloading Boot.** Used mostly while patients are lying in bed. Suspends the feet so there isn't any pressure on the foot or toes.
- **Reverse IPOS (half-shoe) Heel Relief Shoe.** Aids in offloading plantar heel ulcers. The shoe is open in the back and angles at 10-degrees of plantarflexion.
- **IPOS (half-shoe) and Orthowedge Forefoot Relief Shoes.** Both keep pressure off the ball of the foot and have been very helpful in keeping pressure off the great toe. The IPOS, Orthowedge, and IPOS Heel Relief shoes can cause gait imbalance and instability.
- **Charcot Restraint Orthotic Walker (CROW).** A bi-valved AFO that uses a total-contact, custom-molded orthotic and a rocker-bottom sole. Used often during the 2nd and 3rd stages of Charcot arthropathy. They are effective but expensive to make. Non-compliance is high because patients can remove them.
- **Prefabricated Walker.** Similar to a CROW, but the sole of the prefab walker can be removed. This makes it easy to alleviate pressure at a specific spot, and at the same time inspect an ulcer. This is a removable device that leads to compliance issues as seen with the CROW.
- **Ankle Foot Orthoses (AFO).** Custom-molded with thermoplastic material and a rigid ankle. Used mainly for a dropfoot, but has been useful in keeping pressure off the sole of the foot.

- **Patella Tendon-Bearing Brace (PTB).** Removable custom brace. Weight is transferred from the foot to the patella and positions the foot in a proper position for ambulation. Increases rotational control of lower extremity, which reduces pressure of the foot. Expensive and cumbersome.
- **MABAL Shoe/Scotch Boot.** Combination of fiberglass cast and a shoe. Allows for movement of the ankle and can be removed at bedtime.
- **Total-Contact Casting (TCC).** Remains the GOLD STANDARD offloading device for diabetic foot ulcers. Patient must have adequate blood supply in order to use a TCC. The cast must be changed weekly to monitor for other areas of irritation that can occur under the cast. Plaster of Paris can be used to make the TCC. There are also TCC kits that come with a walking boot and all of the materials needed to apply the TCC, which make a much easier application. Compliance is much better with a TCC than a CROW because it cannot be removed by the patient.

Remember that when treating diabetic foot ulceration, it should involve a multidisciplinary approach. A wound care team consisting of podiatrists, vascular surgeons, plastic surgeons, primary care physicians, endocrinologists, and nutritionists should all work together in the prevention and management of diabetic foot ulcers.