

Off-Loading Devices for Diabetic Foot Ulcers: A Review

Context

Type 2 diabetes is a chronic disease characterized by high blood glucose. The estimated prevalence of diabetes in Canada is 6.8% — roughly 2.4 million Canadians — and it is increasing, with a 230% increase from 1998. Diabetic foot ulcer (DFU) is the most common chronic complication, affecting 4% to 10% of patients with diabetes. Predisposing factors include long disease duration, trauma, infection, poor glycemic control, improper footwear, advanced age, smoking, and lower socioeconomic status. However, neuropathy and peripheral vascular disease are the most significant risk factors. DFU complications include wound infection, osteomyelitis, cellulitis, and amputation, and can lead to significant morbidity, mortality, and health care costs.

Technology

High plantar pressure — pressure on the bottom of the foot from the surface below — can increase the risk of DFUs. Devices that off-load and reduce the plantar pressure are used in their prevention and treatment. These off-loading devices include removable options such as cast walkers and orthoses (sometimes called orthotics), or devices that can't be removed by patients such as total contact casting (requiring a skilled technician) and instant total contact casting (making a removable walking cast permanent by wrapping it in casting material).

Issue

Off-loading devices can impact patient mobility, potentially limiting their use and effectiveness. A review of the clinical effectiveness of removable and non-removable off-loading devices, a comparison of their effectiveness, and a review of their comparative cost-effectiveness will help to inform decisions about the treatment and prevention of DFUs.

Methods

A limited literature search was conducted of key resources, and titles and abstracts of the retrieved publications were reviewed. Full-text publications were evaluated for final article selection according to predetermined selection criteria (population, intervention, comparator, outcomes, and study designs).

Key Messages

- The non-removable off-loading devices — total contact casting and instant total contact casting — appear to be more effective than removable devices in the treatment of DFU.
- Of the removable off-loading devices, cast walkers may be the most effective in the treatment of DFU.
- It is uncertain which devices are most effective for DFU prevention.
- Cost-effectiveness evidence was limited but suggests soft-heel casting may be more cost-effective than orthotic boots for DFU prevention and treatment.

Results

The literature search identified 299 citations, 21 of which were deemed potentially relevant. An additional 3 reports were retrieved from other sources. Of these 24 reports, 10 met the criteria for inclusion in this review: 3 systematic reviews, 6 randomized controlled trials, and 1 economic analysis.

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