

## Diabetic Foot Ulcers and Negative Pressure Wound Therapy: 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 280% 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 costs to the health care system.

### Technology

Negative pressure wound therapy (NPWT) involves applying a controlled subatmospheric pressure across the surface of a wound in an airtight dressing. A pump is used to maintain constant or intermittent negative pressure, usually between -75 mm Hg and -125 mm Hg. NPWT is thought to promote wound healing by increasing local perfusion, eliminating tissue edema, drawing wound edges together, removing exudates and proinflammatory cytokines, inhibiting bacterial growth, and promoting cell hyperplasia.

### Issue

Although NPWT has been widely adopted for DFU, it is costly and may result in serious adverse events — prompting a warning to health care providers by the FDA. A review of its clinical and cost-effectiveness and a review of evidence-based guidelines will help to guide decisions on the use of NPWT for the treatment of DFU.

### 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

- NPWT appears to work better than other treatments for DFU.
- NPWT does not appear to increase adverse events.
- NPWT seems to be more cost-effective than other treatments for DFU — but this may vary by health care setting.
- Guidelines suggest that NPWT be considered for DFU, but recent Canadian guidelines cited a lack of evidence to support recommending its use.

### Results

The literature search identified 173 citations, 34 of which were deemed potentially relevant. An additional 9 articles were identified from other sources. Of the 43 studies, 16 met the criteria for inclusion in this review: 3 systematic reviews, 1 meta-analysis, 1 health technology assessment, 1 randomized controlled trial, 3 economic studies, and 7 evidence-based guidelines.

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