

Lower limb complications

DIABETES CARE

Irremovable casting devices are more efficient than TCC

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 This investigation was conducted in order to test the safety, effectiveness and costs of offloading an ulcer using an off-the-shelf irremovable contact casting device.

2 The inclusion criteria were a diagnosis of diabetes of at least 5 years' duration, peripheral neuropathy shown by insensitivity to 10g monofilament test and a VPT of at least 25 volts, and a forefoot plantar ulcer for at least 3 weeks with an area greater than 1cm² of Texas grade 1A or 2A.

3 Forty individuals met the inclusion criteria and were randomised into two groups: total contact casting (TCC; Group A) or irremovable offloading device (Group B). Ulcers were debrided to expose the entire lesion, photographed, measured and then dressed before application of the offloading devices.

4 The individuals were followed up each week for 12 weeks, or until complete re-epithelialisation of the ulcer occurred. Those in group A had their casts cut off, ulcers debrided (if necessary) and dressed and a new cast manufactured, while those in group B simply had the lace cut, and the boot removed and then replaced following any necessary debridement and dressing.

5 No difference was seen between the groups in healing rates at 12 weeks, healing time or number of adverse events.

6 Treatment was less expensive in group B, with a 78% mean reduction of costs compared with group A ($P<0.001$). It was significantly quicker ($P<0.001$) to use the irremovable device in terms of time taken to apply and change casts, and patient satisfaction was higher in Group B ($P<0.001$).

Piaggese A, Macchiarini S, Rizzo L et al (2007) An off-the-shelf instant contact casting device for the management of diabetic foot ulcers: a randomized prospective trial versus traditional fiberglass cast. *Diabetes Care* **30**: 586–90

They blinded me with science: New technologies for the diabetic foot?



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As we strive to practice in an evidence-based manner, is the development of new technologies being hampered or does the need for scientific rigour save us from snake oils, Faradism and other quackery? This quarter brings a rash of technologies being

applied to the diabetic foot. The study designs and statistical techniques often leave a lot to be desired from the lofty heights of large RCTs but in the main are appropriate for trials involving foot ulceration in which valid controls are hard to achieve.

Piaggese et al (summarised on left) are to be praised for their attempts to carry out an RCT with a new pressure redistributing device that can be made irremovable. It gives similar results to total contact casting with less mess and lower costs. However, the plastic lace on the device that serves to make it irremovable looks a bit thin, and I wonder if there have ever been injuries caused by it.

Armstrong et al publish another paper (summarised below) about negative pressure wound therapy (NPWT) and partial foot amputations that appears to be a re-analysis of

the original paper from 2005. This is confirmed by the National Clinical Trials register number. It is no surprise, then, that the time to healing is shorter with NPWT; this follows the finding of the original paper—but interestingly, the number of individuals healing and achieving 76–100% granulation were not different between the two groups. Also, the acute and chronic wounds (less or more than 30 days duration respectively) behaved similarly. If similar numbers healing are achieved, then the trade-offs of time versus NHS finances versus patient cost become all the more important considerations.

Ultrasound (Kavros and Schenck; see overleaf, in which the pre-study period was used as a historical control) and biphasic electrical stimulation (Lawson and Petrofsky; see overleaf comparing various ulcers which are unrelated), are two of the latest attempts to boost wound healing using physical means. The theoretical arguments are explained in the full papers but appear to be 'annoying' the wound into increasing blood flow and therefore healing! Better studies are required before these become accepted into routine care.

Armstrong DG, Lavery LA; Diabetic Foot Study Consortium (2005) Negative pressure wound therapy after partial diabetic foot amputation: a multicentre, randomised controlled trial. *Lancet* **366**: 1704–10

INTERNATIONAL WOUND JOURNAL

NPWT heals wounds faster than SWT

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

1 This study was designed to evaluate the rate and proportion of wound healing of both acute and chronic ulcers treated with either negative pressure wound therapy (NPWT) or standard wound therapy (SWT).

2 NPWT was delivered via the vacuum-assisted closure (VAC) device and SWT included alginates, hydrocolloids, foams or gels.

3 This was a 16-week, multicentre RCT involving 162 participants

randomised to either NPWT (77) or SWT (85). Wounds of a duration of less than 30 days after surgery were considered acute, while those that were of greater duration were considered chronic.

4 No significant difference was observed between the proportion of acute and chronic wounds achieving complete wound closure or 76–100% granulation. However, using NPWT, the time to these classifications was significantly faster in both the acute ($P=0.033$) and chronic groups ($P=0.030$).

5 The authors conclude that wound duration does not seem to affect the efficacy of NPWT in complex wounds following amputation.

Armstrong DG, Lavery LA, Boulton AJ (2007) Negative pressure wound therapy via vacuum-assisted closure following partial foot amputation: what is the role of wound chronicity? *International Wound Journal* **4**: 79–86

MEDICAL SCIENCE MONITOR



Heat helps healing

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 The authors of this study hypothesised that by placing individuals with chronic wounds into a warm room before applying electrical stimulation, skin blood flow would increase and encourage wound healing.

2 Twenty people were recruited for the study and split into two groups: one group without diabetes (10) and one group with diabetes (10).

3 The biphasic electrical stimulation of up to 20 milliamps was administered three times per week for 4 weeks in a room kept at 32°C and blood flow to the skin was measured.

4 Individuals without diabetes showed no significant increase in blood flow; however, those with diabetes had a 215% increase in blood flow on the outside of the ulcer in the first 2 weeks ($P < 0.003$).

5 At the end of the study, those without diabetes had a 38.4% healing rate ($\pm 22.3\%$), while those who had diabetes had a healing rate of 70.0% ($\pm 32.3\%$; $P < 0.003$). The authors conclude that improving stimulation to the centre of the wound may further improve healing rates.

Lawson D, Petrofsky JS (2007) A randomized control study on the effect of biphasic electrical stimulation in a warm room on skin blood flow and healing rates in chronic wounds of patients with and without diabetes. *Medical Science Monitor* **13**: CR258–63

JOURNAL OF THE AMERICAN PODIATRIC MEDICAL ASSOCIATION



Ultrasound improves healing rates

Readability	✓✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓✓

1 This was an open-label, single-centre, non-randomised controlled trial to investigate the effect of non-contact low-frequency ultrasound therapy on lower limb ulcer healing.

2 There were 51 individuals enrolled in this study. Of these, 38 had diabetes and all 51 had chronic lower limb wounds of 3–18 months' duration.

3 All individuals received standard care and were followed on a weekly basis until the investigator felt that healing was no longer progressing; at which point non-contact, low-frequency ultrasound treatment was added.

4 The mean volume reduction of ulcers in the standard care period versus the non-contact low-frequency ultrasound therapy period was 37.3% \pm 18.6% versus 94.9% \pm 9.8% ($P < 0.0001$).

5 The authors concluded that by adding low-frequency, non-contact ultrasound therapy to the existing care protocol, the rate of wound healing and closure was improved.

Kavros SJ, Schenck EC (2007) Use of noncontact low-frequency ultrasound in the treatment of chronic foot and leg ulcerations: a 51-patient analysis. *Journal of the American Podiatric Association* **97**: 95–101