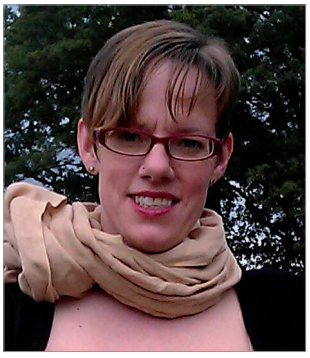
What is a focused rigidity cast? Where do they come from and what is the evidence?



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Wound care clinicians are going to be hearing a lot about focused rigidity casts (FRCs) in the next few years. But what are they and what is their history? Moreover, what is their application in the wound clinic?

These casts are made from a flexible polymer resin, which is not as brittle or hard as fibreglass. An area of increased rigidity is applied to the FRC at the site that requires support, pressure reduction or offloading by increasing the number of layers of bandage. The polymer resin is available in different strengths, selected according to the patient's weight, activity levels, ulcer location and skin fragility. The cast is custom made for the patient's foot and the site requiring offloading, so the shape of the cast varies. For example, the heel or Martini cast is small and only fits around the region of the heel (Stuart, 2008; Hutchinson et al, 2010; 2011), while a slipper cast covers the whole foot (Dagg et al, 2013a). At present there appears to be no standardised method of applying the FRC, with some clinicians using an underlayer of soft band (Stuart et al, 2008), others applying padding over bony prominence, and some using no extra padding (Dagg et al, 2013b). Despite these different methods of application, the basic underlying principle is the same – to reduce pressure at the ulcer site. FRCs can be used to reduce pressure from the plantar surfaces or borders of the foot.

From the author's own experience and using anecdotal evidence from podiatrists in other trusts, people with both rheumatoid arthritis and diabetes are benefiting from being treated with FRCs. Healing time has been reduced from 6 months to as little as 3 weeks in the author's experience. There is a steadily growing body of evidence supporting the use of the FRC in the management of plantar ulceration (Stuart et al, 2008; Hutchinson et al, 2010; 2011; Malone et al, 2012; Dagg et al, 2013b). The advantages of FRCs over other offloading devices, such as the Aircast® boot (DJO Global), are that they are lightweight, cheap and unobtrusive and can be worn in a normal shoe.

FRCs were first pioneered with fractures (Wierzimok et al, 1995). Petty and Wardman (1998) first suggested FRCs could be used for people with diabetic foot ulcers, following observations made during a study examining the effectiveness of the casting technique for fractures and ligament injuries.

The first documented use of FRCs for plantar ulceration was by Stuart et al (2008) who reported faster healing in 70 patients. Hutchinson et al (2010; 2011) produced similar findings in 120 people with heel ulceration. Not only was there an improvement in wound size and healing rate, but there was also a reduction in pain. However, to date, little research has been undertaken to explain how FRCs work when used for plantar ulceration or even if they do aid healing. The only known published studies examining the influence of the FRC on plantar pressures are a single case review (Malone et al, 2011) and a pilot study (Dagg et al, 2013b).

The pilot study examined the effects of the FRC on forefoot plantar pressures in 31 healthy participants with no known pathologies, compared to a control shoe (Dagg et al, 2013b). The study found that the FRC reduced forefoot pressures and redistributed pressure to the reinforced area beneath the cast and to the mid foot. Although this provides a baseline for further research and explains how the FRC works, it does not attempt to explain the effects of the FRC on symptomatic patients.

The first large-scale, multicentre RCT is currently being conducted by the Nottingham clinical trials team, led by William Jeffcoate. This will examine the effects of heel casts on wound healing and pain in people with diabetes and heel ulcers. The study will run until August 2014 (www.heels-trial.co.uk).

FRCs are increasingly being used in the successful management of plantar ulcerations (Stuart et al, 2008; Hutchinson 2010; 2011; Malone et al, 2011) and because they are custom made for the patient, they can be used at any location on the planar aspect and borders of the foot. They are cheap, unobtrusive, and can fit in normal footwear. No doubt they will be in a clinic near you soon. WUK

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