

# Update of systematic review on debridement

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## ARTICLE POINTS

**1** Diabetic foot ulcers heal faster when a hydrogel is used instead of gauze or standard care.

**2** Although, the clinical evidence in support of debridement is lacking, treatment is regarded as a necessity for patient acceptability and for the prevention of infection.

**3** This systematic review allowed the effectiveness of wound debridement in diabetic foot ulcers to be assessed.

## KEY WORDS

- Debridement
- Wound healing
- Hydrogels
- Ulcer

## Introduction

**Debridement of an ulcer, which has been reported as essential to healing, can done in several ways, including treatment with hydrogels. This article is an update of the systematic review published in *The Diabetic Foot* (Smith 2001a, Smith 2001b, Smith 2001c) and reports on the valuable clinical evidence that was obtained by pooling the results of all the hydrogel trials. We have assessed the evidence for the effectiveness of debridement and have found that diabetic foot ulcers heal faster when a hydrogel is used instead of gauze or standard care.**

**O**ne crucial element of wound healing is weight relief; another key element is debridement.

Although there are few studies to support the use of debridement (Steed et al, 1996), it is widely believed that sharp debridement of an ulcer, including the removal of callus which may surround or 'roof over' the ulcer, and of all devitalised tissue, is essential to healing. However, compliance with a regimen of weight relief is likely to be the primary determinant of healing (Cavanagh et al, 2000). Once the foot has reached an ulcerated stage the aim is to heal ulcers within the first 6 weeks of ulcer development. All the components of multidisciplinary management are important at this stage:

- Mechanical control
- Wound control
- Microbiological control
- Vascular control
- Metabolic control
- Educational control (Edmonds 2000)

## Debridement

Debridement is recommended in the Scottish Guidelines (SIGN, 1997) alongside antibiotic therapy for infection and pressure relief as treatment for patients who have developed ulceration or gangrene with risk of amputation. The Royal College of General Practitioners guidelines (2000) also specify use of debridement for the treatment of the ulcerated foot in addition to local wound management and

appropriate dressings.

Edmonds et al (2000) described debridement as the most important part of wound control and gave the following rationale for debridement of neuropathic ulcers.

- Debridement enables the true dimensions of the ulcer to be perceived.
- Debridement allows drainage of exudate and removal of dead tissue; both render infection less likely.
- Debridement enables a deep swab to be taken for culture.
- Debridement encourages healing, by restoring a chronic wound to an acute wound.

Although, the clinical evidence in support of debridement is lacking, treatment is regarded as a necessity for patient acceptability and for the prevention of infection (Bale, 1997).

The removal of callus in a pre-ulcerative state (from unbroken skin) is thought to prevent or at least delay ulceration, and in an ulcerative state is thought to be essential for optimum healing (Edmonds et al, 2000). Because callus is tough, chemical debriding agents and proprietary corn remedies should not be used. Anything strong enough to destroy callus can have catastrophic effects on adjoining tissues. Instead, sharp debridement with a scalpel and forceps is the technique of choice, where the surrounding callus, together with slough is gently cut away. This process stimulates healing and is safe in the well-

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**1** A systematic review applies explicit scientific principles, aimed at reducing random and systematic errors.

**2** Only RCTs evaluating a method of debridement in the treatment of diabetic foot ulcers were included. The outcome had to include either complete healing or rate of healing.

**3** Hydrogels were significantly more effective than gauze or standard care in healing diabetic foot ulcers when the results from the hydrogel trials were pooled.

**4** Well designed RCTs of sufficient size are needed to assess the effectiveness of debridement of diabetic foot ulcers. Such trials give the most reliable estimates of effect and are least likely to be biased.

perfused neuropathic foot. Only practitioners with appropriate training should undertake sharp debridement of neuropathic ulcers (Foster et al, 1999).

There are many different methods that can be used to debride a wound. These are broadly classified as surgical/sharp, biosurgical, mechanical, chemical, enzymatic and autolytic (Lewis et al, 2001).

**Our systematic review**

A systematic review is a tower of statistical power that allows researchers to rise above the body of evidence, survey the landscape and map out the future direction (Mulrow, 1995). A systematic review applies explicit scientific principles, aimed at reducing random and systematic errors. Traditional literature reviews are less likely to detect small but clinically significant effects as they do not use formal methods and systematic statistical techniques. They are also more likely to be biased than a systematic review.

One study standing alone exists as one piece of the jigsaw puzzle; its true value is how it fits in with the other pieces of research. The systematic review of randomised control trials (RCTs) allows all the separate pieces of the puzzle to be looked at individually and the overall clear picture easily seen.

**Search strategy**

We assessed the effectiveness of wound debridement in diabetic foot ulcers (Smith, 2001a; Smith 2001b; Smith 2001c). We searched electronic databases, journals, bibliographies, and unpublished work. The search was completed in January 2000.

Only RCTs evaluating a method of debridement in the treatment of diabetic foot ulcers were included. The outcome had to include either complete healing or rate of healing. There was no restriction on articles/trials based on language or publication status.

**Results**

We identified five RCTs on debridement; three assessed the effectiveness of a hydrogel as a debridement method, one evaluated surgical debridement and one evaluated larval therapy. The individual trial

results showed no statistically significant differences in healing between methods of debridement. However, hydrogels were significantly more effective than gauze or standard care in healing diabetic foot ulcers when the results from the hydrogel trials were pooled (relative risk 1.84 [1.30-2.61]; 95% CI: 0.10–0.36). The chance of healing with hydrogel rather than a standard dressing is increased by 30–160%.

Surgical debridement and larval therapy showed no significant benefit in these small trials. Other debridement methods such as enzyme preparations or polysaccharide beads have not been evaluated in RCTs on people with diabetes.

**Conclusion**

There is evidence to suggest that using hydrogels rather than gauze or standard wound care increases the healing rate of diabetic foot ulcers. The research, however, cannot recommend any one specific hydrogel over another. More research is needed to evaluate the effects of a range of widely used debridement methods and of debridement per se.

**Discussion**

The RCTs on the debridement of foot ulcers in people with diabetes are in general of poor methodological quality. Consequently, whilst the results are suggestive of a positive effect of debridement, these results should be viewed with extreme caution. It is clear that researchers need to be more mindful of the need for unbiased, objective assessment of ulcer healing in future trials. Well designed RCTs of sufficient size are needed to assess the effectiveness of debridement of diabetic foot ulcers. Such trials give the most reliable estimates of effect and are least likely to be biased. Future trials evaluating debridement need to take into account the importance of proper random assignment of patients, concealed allocation, adequate sample size, and assessors of masked allocation.

**National survey of debridement**

We are currently designing a RCT to compare the effects of different methods of debridement on the healing of diabetic foot

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**1** To enable us to identify which methods of debridement are most widely used we have undertaken a national survey of current practice.

**2** The debridement questionnaire was sent to every podiatry manager at the beginning of October 2002 and asked that the podiatrist specialising in diabetes complete the questionnaire.

**3** The information from the questionnaires will be used to write the RCT protocol; specifically looking at number of trial sites and participants which will be needed, methods of random assignment, treatment groups and methods of masking outcomes.

ulcers. To enable us to identify which methods of debridement are most widely used we have undertaken a national survey of current practice. We were also keen to identify potential research collaborators. The debridement questionnaire was sent to every podiatry manager at the beginning of October 2002 and asked that the podiatrist specialising in diabetes complete the questionnaire.

The information from the questionnaires will be used to write the RCT protocol; specifically looking at number of trial sites and participants which will be needed, methods of random assignment, treatment groups and methods of masking outcomes; the protocol once completed will then be submitted for funding.

Although the submission date for the questionnaires has now past, as a result of the survey we have been able to compile a national database of names of podiatrists and diabetic foot clinic addresses. Therefore if you did not complete a questionnaire, please contact us (ideally by email) to be added onto the National Diabetic Foot Clinic database: Jude Smith, Department of Podiatry, Diabetes Centre, York District Hospital, Wigginton Road, York, YO31 8HE (Judith.A.Smith@EXCHA.YHS-TR.NORTHY.NHS.UK)

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