

Is the scalpel the only way to debride?

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Article points

1. A range of debridement techniques are used in wound management in the UK.
2. A range of debridement techniques are available for delivery by specialist and generalist clinicians alike.
3. A new method of mechanical debridement is available in the form of Debrisoft® (Activa Healthcare), a unique monofilament debridement pad.
4. The Debrisoft's inert fibres are of a length, thickness, and density that allows them to loosen moist necrotic tissue, keratoses, slough, biofilm, and adherent exudate from the wound and periwound, absorbing and binding the debris within the fibres.

Key words

- Debrisoft
- Mechanical debridement
- Wound bed preparation

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Debridement of nonviable tissue has been established as a key component of effective diabetic foot care. A range of debridement techniques are available and the selection of a specific technique should be based on the nature of the wound and patient preference. In this article, those methods of wound debridement that can be undertaken by specialist and generalist clinicians alike are explored.

The word debridement derives from the French word *débridement*, and was first described in clinical medicine by Henri Le Dran (1685–1770). There is full consensus in the literature that debridement of chronic wounds up to the level of healthy tissue represents a necessary step in the healing process (European Wound Management Association [EWMA], 2004; Kammerlander et al, 2005; Ovington and Schultz, 2005; Bates-Jones and Apeles, 2007; Rodeheaver and Ratliff, 2007). As such, clinicians have a duty of care to provide debridement as needed by their patients in a manner that is timely, safe, and appropriate.

In the context of diabetic foot care, Professor David Armstrong put it well by stressing that it is not what you put on a wound that heals it, but rather what you take off (Armstrong et al, 2004). This maxim has been demonstrated by those centres that have embraced this ethos and achieved positive outcomes as a result (Steed et al, 1996).

This article focuses on those methods of debridement that can safely be undertaken by specialist and nonspecialist clinicians alike, supported by pathways for rapid referral of patients to a foot protection, (FPT) or hospital-based multidisciplinary, team (MDT).

Background

Debridement is defined as: “The act of removing necrotic material, eschar, devitalised tissue serocrusts, infected tissue, hyperkeratosis, slough, pus, hemoatomas, foreign bodies, debris, bone

fragments or any other type of bioburden from the wound with the objective to promote wound healing” (EWMA, 2013). Similarly in the recent document, *Effective Debridement in a Changing NHS – A UK Consensus* (Wounds UK, 2013), an expert working group defined debridement as: “The removal of dead, nonviable/devitalised tissue, infected or foreign material from the wound bed and surrounding skin”.

Why debride?

Safe and effective debridement is considered to be a beneficial component of wound management because of the associated reductions in exudate levels, malodour, and the promotion of granulation tissue in the wound bed (Vowden and Vowden, 2011). Failure to remove nonviable material and debris from a wound may expose the patient to a range of risks, including:

- Impeding normal wound healing activities at a cellular level (e.g. angiogenesis, granulation, extracellular matrix formation, epidermal resurfacing [Weir et al, 2007]).
- Acting as a physical barrier to topical antimicrobials, thereby reducing their effectiveness (Weir et al, 2007).
- Serve as a source of nutrients for bacteria (e.g. Bacteroides species, *Clostridium perfringens* [Leaper, 2002]).
- Prevention of the practitioner from accurately assessing the extent of the wound (Leaper, 2002; Weir et al, 2007).
- The overproduction of exudate and/or the presence of malodour (Vowden and Vowden, 2011).

Debridement techniques

A range of debridement techniques are used in wound management in the UK, most commonly autolytic, larval, mechanical, hydrosurgical, ultrasound, sharp, and surgical. Each of these techniques will be more or less appropriate in each case, based on the type of wound, the point in the natural history of that wound, and the patient's preferences.

For those wounds in which it is appropriate, a range of debridement techniques are available for delivery by specialist and generalist clinicians alike. These methods, their advantages and disadvantages, and those who might deliver the interventions, are summarised in *Table 1*.

Autolytic debridement

Autolytic debridement is the natural process by which the body's own enzymes soften and liquefy slough and eschar. This process can be supported by the application of the principles of moist wound healing, and dressings that support this (e.g. occlusive or semiocclusive dressings) that aid

moisture balance. The technique is important in clinical practice as it softens and rehydrates eschar, either as a method of debridement by itself or in preparation for future alternative methods.

Supporting autolytic debridement through the use of dressings is the most common form of debridement. This is likely due to the fact that low levels of clinical skill and knowledge are required to carry it out. This method of debridement can be a slow process and can carry the risks of complications associated with any delays in wound healing. It is important the progress of autolytic debridement is monitored and the dressing changes are not allowed to become an ineffective and ritualistic activity undertaken in isolation that fail to the progression of the wound to healing.

Larval therapy

Larval therapy – also called biosurgical or maggot therapy – is the application of medical-grade larvae to a wound. The larvae secrete

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3. Autolytic debridement is a natural process that can be supported by the application of the principles of moist wound healing.
4. Larval therapy is the application of medical-grade larvae to a wound.

Page points

1. Traditional mechanical debridement is the process of applying dressings/fabrics to wounds that are pulled away taking with them attached tissues and debris.
2. Traditionally, mechanical debridement has been limited to the “wet-to-dry gauze” – a method now widely accepted to be an inappropriate and out-dated technique.
3. A more modern method of mechanical debridement is now available in the form of Debrisoft® (Activa Healthcare), a unique monofilament debridement pad.
4. The Debrisoft’s inert fibres are of a length, thickness, and density that allows them to loosen moist necrotic tissue, keratoses, slough, biofilm, and adherent exudate from the wound and periwound, absorbing and binding the debris within the fibres.

proteolytic enzymes that liquify necrotic tissue and pathogens and are then ingested.

A level of skill and competence is required to effectively apply this therapy, and in selecting the right patient with a wound at a suitable stage to gain maximum benefit.

Mechanical debridement

Traditional mechanical debridement is the process of applying dressings/fabrics to wounds; the top layer of the wound bed dries and adheres to the dressing/fabric which is then pulled away from the wound taking the attached tissues and debris with it. This type of mechanical debridement has been limited to the “wet-to-dry gauze” method, which can be slow (i.e. multiple episodes may be required to achieve complete debridement), intensely painful for some patients, and nonselective (i.e. removing both healthy and unhealthy tissues). Today, this method is widely accepted to be inappropriate and out-dated (Ovington, 2001).

A more modern method of mechanical debridement is now available in the form of

a unique monofilament debridement pad (Debrisoft®; Activa Healthcare; Haycocks and Chadwick, 2012). The monofilament pad has a fleecy appearance and feel and is designed to be moistened (with tap water, saline, or an antimicrobial solution, as appropriate) and applied with light pressure to the wound in circular motions for 2–3 minutes to achieve the debridement, and then discarded.

The pad’s inert fibres are of a length, thickness, and density that allows them to loosen moist necrotic tissue, keratoses, slough, biofilm, and adherent exudate from the wound and periwound, absorbing and binding the debris within the fibres (Westgate and Cutting, 2012).

Little skill or experience is required to use this form of debridement as there is virtually no possibility of causing any damage. The pad can be used alone, or as a precursor, or follow-up, to larval therapy or sharp debridement. The pad can be used in the patient’s home, community wound care clinics, GP surgeries, or any inpatient setting.

Table 1. Types of debridement that do not require a scalpel and can be delivered by specialist and generalist clinicians alike (adapted from Wounds UK, 2013).

| Type | Mechanisms of action | Advantages | Disadvantages | Who/where |
|------------------------------|---|---|---|--|
| Autolytic | A naturally occurring process in which the body’s own enzymes and moisture rehydrate, soften and liquify hard eschar and slough. Occlusive or semi-occlusive dressings (hydrogel, hydrocolloid, alginate, or superabsorbent polymer dressings) help to achieve moisture balance, by absorbing excess exudate or donating moisture | Can be used before or between other methods of debridement (i.e. maintenance debridement) | The process is slow, increasing potential for infection and maceration | Generalists and specialists |
| Mechanical | Traditional “wet-to-dry” method is not recommended in the UK. Newer methods include removing non-viable tissue from a wound using a monofilament soft pad (Debrisoft®; Activa Healthcare) | Debrisoft is quick and easy. It can achieve effective removal of hyperkeratosis and slough. Little pain is experienced. Can be used as a precursor or follow-up to larval therapy or sharp debridement. Patients can use it under supervision | Not suitable for use on hard, dry eschar. Not suitable for already painful wounds | Generalists and specialists. Can be undertaken in the community, the clinic, or at the bedside |
| Larval therapy (biosurgical) | Larvae of green bottle fly (<i>Lucilia sericata</i>) remove moist, devitalised tissue from the wound. Larvae are also able to ingest pathogenic organisms present. Larvae are available loose or in a “bagged” dressing | Highly selective and rapid | Unit costs higher than for autolytic debridement. Treatment time is short. Needs to be planned in advance. Not suitable for all patients or wounds (e.g. malignant lesions, wounds that bleed easily or communicate with a body cavity of an organ or are near major blood vessels, hard dry necrotic tissue; wounds with excessive exudate or where the larvae cannot be protected from being crushed (e.g. plantar wounds). See manufacturer’s instructions on use with antibiotics. Exercise caution in patients receiving anticoagulant therapy | Generalists or specialists. Bagged larvae method reduces the level of skill required |

Key: Orange A natural process facilitated by moist wound healing; Pink Generalist clinicians can perform these methods;

A case report is provided in *Box 1* that illustrates the complex needs of the person with diabetic foot ulceration. During the course of care – across inpatient and outpatient settings – Mr X received surgical, sharp, and mechanical debridement with Debrisoft.

Delivering debridement for the diabetic foot

Multidisciplinary team care (be it FPTs or MDTs) is the gold standard for the high-risk diabetic foot and the foot with active disease (NICE, 2004; SIGN, 2010). Podiatrists deliver the bulk of diabetic foot care in the UK and are key members of the FPT and MDT; they play major roles in care planning, the delivery of complex interventions, and leading these teams (TRIEPodD-UK, 2012). However, the multidisciplinary team approach to diabetic foot care is based on the principles of shared care and, as such, a range of clinicians share joint responsibility for the patient's care, with individual clinicians delivering specific elements of care based on their skills, knowledge, and competency (White, 2010).

In these times of reducing healthcare budgets, it is important to recognise that shared care can reduce costs, without any loss in care quality or safety (Hardwick et al, 2013). Where products or techniques are available that allow care to be delivered by generalist clinicians in lower-cost settings, they should be utilised.

The expert working group behind *Effective Debridement in a Changing NHS – A UK Consensus* (2013) have identified that wound care is increasingly seen as solely the preserve of “specialists” (i.e. tissue viability nurses, specialist podiatrists), leaving nonspecialist podiatrists and nurses believing that delivering any wound care interventions is beyond them. As illustrated with regard to a number of effective debridement techniques in this article, many elements of a holistic wound care package can and should be delivered by nonspecialists embracing the shared care approach to wound care.

While acute diabetic foot ulceration and its complications require urgent, inpatient care delivered by an MDT (NICE, 2004), chronicity is common (Tsourdi et al, 2013) and long-term

Box 1. Case study: Mr X

Mr X is a 57-year-old man with type 2 diabetes of 12 years' known duration. He has profound peripheral neuropathy and slightly compromised circulation.

He presented to the author's hospital-based multidisciplinary team with severe ulceration of the first right toe, spreading cellulitis, and underlying osteomyelitis. Mr X reported having self-treated an area of callus 4 weeks prior to presentation.

After 3 weeks' intense management by the MDT, the extent of the osteomyelitis necessitated surgical amputation of the first ray. Following consultation with Mr X, the surgery was carried out in theatre by the orthopaedic surgeon.

Mr X's care immediately post-surgery was undertaken solely by the MDT, during which infection control, pressure relief, reambulation, and exudate management were addressed. As the post-surgical wound was not located on a weight bearing area of the foot, only light callus developed during healing.

It was agreed that Mr X's care could safely be shared between the MDT, the treatment room in his local GP's practice, and the district nursing team.

During some follow-up visits to the MDT, sharp debridement was carried out by the specialist podiatrist on areas of thicker callus, before switching to the monofilament pad, Debrisoft® (Activa Healthcare). It was felt that Debrisoft would be the safest and most appropriate form of maintenance debridement for Mr X's post-surgical wound, addressing hyperkeratosis at the wound edges, and keeping the wound bed free of devitalised cells, slough, and pathogens without disrupting healthy granulating tissue. Debrisoft was used by all clinicians treating the patient, as the level of skill required to use this form of debridement is low. Clinicians reported the product to be quick and simple to use in any setting.

Twelve weeks after surgery, Mr X's wound had progressed well (*Figure a*). Debrisoft remained the product of choice for maintenance debridement (*Figure b*).

At the time of writing Mr X's wound had healed and he was awaiting the fitting of prescription footwear.



“The multidisciplinary team approach to diabetic foot care is based on the principles of shared care.”

“Debrisoft® (Activa Healthcare) removes some of the constraints around delivering mechanical debridement. The product is safe, quick, and simple to use in a variety of care settings, by clinicians of all skill levels.”

inpatient care for chronic wounds is expensive, often unwished for by the patient, may expose them to hospital-acquired infection or pressure damage, and will not necessarily progress the wound to healing with greater rapidity. Chronic ulcers typically require repeated episodes of maintenance debridement (EWMA, 2004), often undertaken in the community. Debrisoft is a useful modality that can be effectively delivered by generalists.

Conclusion

Provided here is a summary of the types of debridement available in the UK for use by specialist and generalists alike, and the need to engage generalist colleagues in those aspects of care that they can safely carry out. No one person has all the skills required to manage a diabetic foot ulcer alone, which is why the ethos of multidisciplinary care should be embraced.

The word debridement means to “remove a constraint” and, in the author’s opinion, Debrisoft removes some of the constraints around delivering mechanical debridement. The product is safe, quick, and simple to use in a variety of care settings, by clinicians of all skill levels. ■

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