

# Understanding methods of wound debridement

Leanne Atkin

## Abstract

Autolytic debridement describes the body's natural method of wound-bed cleansing, helping it to prepare the wound bed for healing. In acute wounds, autolytic debridement occurs automatically and often does not require intervention, as during the inflammatory stage of a wound, neutrophils and macrophages digest and removes devitalised tissue, cell debris and contaminants, clearing the wound of any cellular barriers to healing. In chronic wounds, by contrast, healing is often delayed, frequently because of inadequate debridement. The autolytic process becomes overwhelmed by high levels of endotoxins released from damaged tissue (Broadus, 2013). Therefore wound debridement becomes an integral part of chronic-wound management and practitioners involved in wound care must be fully competent at wound-bed assessment and have an awareness of the options available for debridement. This article will review wound-bed assessment, highlighting variations in devitalised tissue, and explore options available for wound debridement, taking into consideration patients' pain and quality of life.

**Key words:** Debridement ■ Wound management ■ Wound assessment ■ Non-viable tissue ■ Slough

Management of a wound, be it chronic or acute, involves continual effective holistic assessment and ongoing evaluation of the patient, including: aetiology of the wound, wound bed, periwound area, signs of infection, general patient malaise and review of wound dressings chosen to promote the healing process (Ousey and Atkin, 2013). This continuous and accurate wound assessment is essential to ensure appropriate and realistic goal setting (Collier, 2003). It is essential that the practitioner assesses the whole of the patient (ie. holistically), not simply just the wound bed. According to the World Union of Wound Healing Societies (WUWHS) (2008) consensus document, to enable effective treatment of patients with wounds the diagnostic process will:

- Determine the cause of the wound
- Identify any comorbidities/complications that may contribute to the wound or delay healing

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Accepted for publication: May 2014

- Assess the status of the wound
- Help develop the management plan.

After holistic assessment of the patient, the focus can then turn to the wound bed. To facilitate practitioners' structured assessment of the wound bed, wound assessment tools can be used—such as TIME, an acronym developed by the European Wound Management Association (EWMA) (2004):

- T=Tissue, non-viable or deficient
- I=Infection or inflammation
- M=Moisture imbalance
- E=Edge of wound, non-advancing or undermined.

TIME provides a structure to allow the clinician to focus on certain aspects of the wound to facilitate appropriate and realistic goal-setting. Often on wound-care plans, the stated aim of the intervention is 'to promote healing', but having such a broad and non-specific goal can make reassessment difficult. This raises the question: how do you assess the promotion of healing?

If care-plan goals are linked to assessment of the wound bed, on the other hand, goals can be more specific. For example, if wound assessment with TIME identifies that there is a problem with non-viable tissue, the aim of the wound-care plan would be 'to debride'. Having clear aims then allows for meaningful evaluation of whether the current wound product is meeting the desired aims.

## Devitalised tissue

'Devitalised tissue' or 'non-viable tissue' are terms that are used interchangeably. They describe tissue that has no blood supply and will not come back to life with treatment or time (Wounds UK, 2013). This devitalised non-viable tissue needs removing to allow healing to occur. Non-viable tissue can occur for a number of reasons, including: infection, ischaemia, hypoxia of the wound bed and dehydration of the wound bed. Non-viable tissue comes in many different forms, from thin superficial slough (Figure 1), thick slough (Figure 2), dehydrated slough (Figure 3), and strongly adhered dry necrotic tissue/eschar (Figure 4).

The presence of devitalised tissue will delay wound healing, as it prevents the formation of granulation tissue. It can also be a source of bacterial growth, increasing the risk of infection (Broadus, 2013). Therefore practitioners need to focus on removing the non-viable tissue as rapidly as possible, but also be aware that in certain situations debridement should be avoided. For instance, in patients affected by peripheral arterial disease, non-viable tissue such as distal necrosis may be intentionally left to auto-amputate (i.e. fall off) (Figure 5). Only after adequate revascularisation should



Figure 1. Wound with thin superficial slough

Figure 2. Thick slough

Figure 3. Dehydrated slough

Figure 4. Strongly adhered dry necrotic tissue/eschar

Figure 5. Distal necrosis

debridement be encouraged and this should only be done by the specialist team.

### Debridement

The literal meaning of 'debride' is to remove constraint (ie. 'to unbridle'). In relation to wound management, debridement means to remove adherent, dead or contaminated tissue from the wound. It is completely separate from the act of cleansing, which is defined as the removal of dirt, loose metabolic waste or foreign material (Strohal et al, 2013). For many years, debridement has been recommended by clinical guidelines from bodies such as the European Wound Healing Society (Strohal et al, 2013) and Wounds UK (2013). But there has been a lack of evidence to investigate whether or not debridement really does accelerate wound healing.

A recent study, however, provides evidence that it does. Wilcox et al (2013) analysed 154 644 patient records over a 4-year period. All the patients attended a wound-healing clinic for a variety of wound types, the most common being venous leg ulcer (26.1%) followed by diabetic foot ulceration (19%). Their retrospective study showed that nearly twice as many venous leg ulcer and diabetic foot ulcerations completely healed with frequent debridement compared with those treated less frequently—50% versus 30% in the venous leg ulcer group and 30% versus 13% in the diabetic foot ulceration group, respectively. Wilcox et al (2013) concluded that frequent debridement resulted in shorter healing times for all wound types ( $P < 0.001$ ).

### Debridement options

Many factors will influence the decision about which

method of debridement to use. These factors include type of tissue, pain, the patient's environment, the patient's choice, age, skills of the practitioner, resources, the patient's quality of life, and professional regulations and guidelines (Strohal et al, 2013). There are many different methods of debridement including: autolytic, larval, mechanical, sharp, surgical and hydrosurgical. Debridement can be done just once, episodically or continuously over a number of weeks (Ousey and Cook, 2012).

It is important to remember that certain debridement techniques require the practitioner to have specific skills and competencies. Not all nurses involved in wound care need to be able to perform all methods of debridement. However, every nurse must be competent at deciding which method of debridement is required. While they may not necessarily be trained in that specific option, they should be able to recognise the need and refer on to an appropriately qualified practitioner. Wound UK's (2013) consensus document for debridement argues that for practitioners to consider accelerating healing through debridement, they must be equipped with knowledge and understanding of:

- The debridement options available, how and why they are undertaken
- The interventions (including referral) open to them; and
- How to measure the success of those interventions.

This knowledge and understanding will enable practitioners to:

- Recognise when debridement is required
- Decide which technique is most suitable; and
- Act/refer appropriately to ensure the patient receives the best care.

### Autolytic debridement

The natural process of autolytic debridement is the most common method and can be done by nurses without specialist skills. All wound dressings that optimise a moist wound environment by adding moisture to the wound bed, or removing excess fluid, aid the process of autolysis, where the body's enzymes break down the non-viable tissue. Autolytic debridement is often used as the sole source of debridement, but this can require numerous treatments over a long period of time. This option is selective, painless, non-invasive and easy to perform. But it can also be slow, which can potentially increase the risk of infection or maceration.

### Larval

Larval therapy or maggot therapy biologically debrides the wound bed. The maggots liquefy and digest necrotic tissue, kill and consume bacteria, and stimulate wound healing by promoting fibroblast growth (Broadus, 2013). They come either 'free range' (placed directly onto the wound bed) or contained within bags. Larval therapy provides rapid, selective debridement, but attracts higher unit costs and may not be readily accepted by some patients.

### Mechanical

Mechanical debridement physically removes debris from the wound bed and does so rapidly compared with other methods. But it was thought to be painful and non-selective, and fell out of favour.

Mechanical debridement has only recently come back into accepted use in the UK. Previous methods of mechanical debridement were the use of 'wet-to-dry' gauze. This involved placing a piece of wet gauze over the wound, allowing the gauze to dry out and adhere itself to the wound bed—and then physically removing it, effectively 'waxing' the top of the wound. This practice has not been used for many years in the UK due to the pain and trauma to the patient and the wound bed.

However, recently, the use of mechanical debridement is again on the increase through the use of monofilament debridement pads (Debrisoft). Debrisoft is a single-use, soft, polyester fibre pad, which is gently wiped across the wound. The exudate, dead cells and wound debris are removed and retained in the monofilament fibres. With this device, debridement takes on average 2–4 minutes per wound and is done without the need for analgesia (National Institute for Health and Care Excellence (NICE), 2014).

NICE recently published recommendations for the use of Activa Healthcare's Debrisoft monofilament debridement pad in the management of acute and chronic wounds. They reviewed the evidence and found that debridement (by Debrisoft) was effective in 93.4% (142/152) of the sessions. During the debridement procedure, 45% of patients reported that they experienced no pain, 50.4% reported slight discomfort of short duration (mean 2 minutes) and 4.6% reported moderate pain of short duration (mean 2.4 minutes). No side effects were reported after the procedure by 56 of 57 patients, nor were any adverse events reported.

Clinicians reported that the Debrisoft pad removed debris, slough, dried exudate and crusts efficiently, without damaging the fragile skin surrounding the wound (NICE, 2014). NICE (2014) also calculated cost savings through the use of Debrisoft within the community, estimating that Debrisoft could save the NHS up to £484 per patient for complete debridement of a wound, compared with current standard management.

### Sharp debridement

Sharp debridement is the removal of dead tissue with scissors, scalpel and/or forceps, often just above the level of viable tissue. It is vital that the practitioner is able to distinguish between viable and non-viable tissue. Sharp debridement is quick and selective in experienced hands, and is often pain-free for the patient.

Sharp debridement should only be carried out by a practitioner with the proven skills and knowledge. It can be done in a treatment room, at a patient's home or at their bedside. However, Leak (2012) argues that sharp debridement is not suitable as a home-based treatment due to the lack of resources available should complications occur.

### Surgical debridement

Surgical debridement is done in the operating theatre, often by a surgeon. It offers instant results and involves complete debridement of the wound bed down to healthy viable tissue. However, it can result in a larger wound, as some viable tissue may be sacrificed. Surgical debridement often requires a form of anaesthetic to ensure a pain-free intervention with continued analgesia. It is associated with increased costs due to being performed in a theatre environment.

### Hydrosurgery

Hydrosurgery involves the use of pressurised water or saline as a cutting tool through a disposable handset. It provides a quick method of debridement, which is selective, but it can be painful for patients, occasionally requiring local or regional anaesthetic.

Hydrosurgery can be done in a non-theatre environment, such as a treatment room, but caution is needed due to the water vapour spray and potential for cross-contamination; protective clothing and goggles need to be worn. Hydrosurgery can be costly due to the price of the disposable handset, but it is still less costly than surgical debridement because it does not require theatre time.

### Conclusion

Debridement is considered an essential part of wound-bed preparation, removing the barriers that impede wound healing. However, currently there is no robust evidence to support one technique of debridement over another—ultimately, the choice of which method to use rests on the expertise and judgement of the clinician (Falabella, 2006). Practitioners need to be fully aware of all options of debridement, as suboptimal care can lead to delayed healing, increased pain, increased risk of infection and inappropriate use of wound dressings, all of which affect a patient's quality of life (Ousey and Cook, 2011). Patients with chronic wounds face a number of issues, such as pain, restrictions in mobility, social isolation and psychological problems (Franks and Moffatt, 1999). Care planning needs to incorporate all these issues while simultaneously preparing the wound bed for healing, as the ultimate goal in wound management is to improve a patient's overall quality of life. BJN

*Conflict of interest: none*

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### KEY POINTS

- In chronic wounds, healing is often delayed by inadequate debridement
- Management of a wound involves continual effective holistic assessment and ongoing evaluation of the patient
- Debridement is considered an essential part of wound-bed preparation, removing the barriers that impede wound healing
- For practitioners to consider accelerating healing through debridement, they must be equipped with the appropriate knowledge and skills
- The ultimate goal in wound management is to improve the patient's overall quality of life

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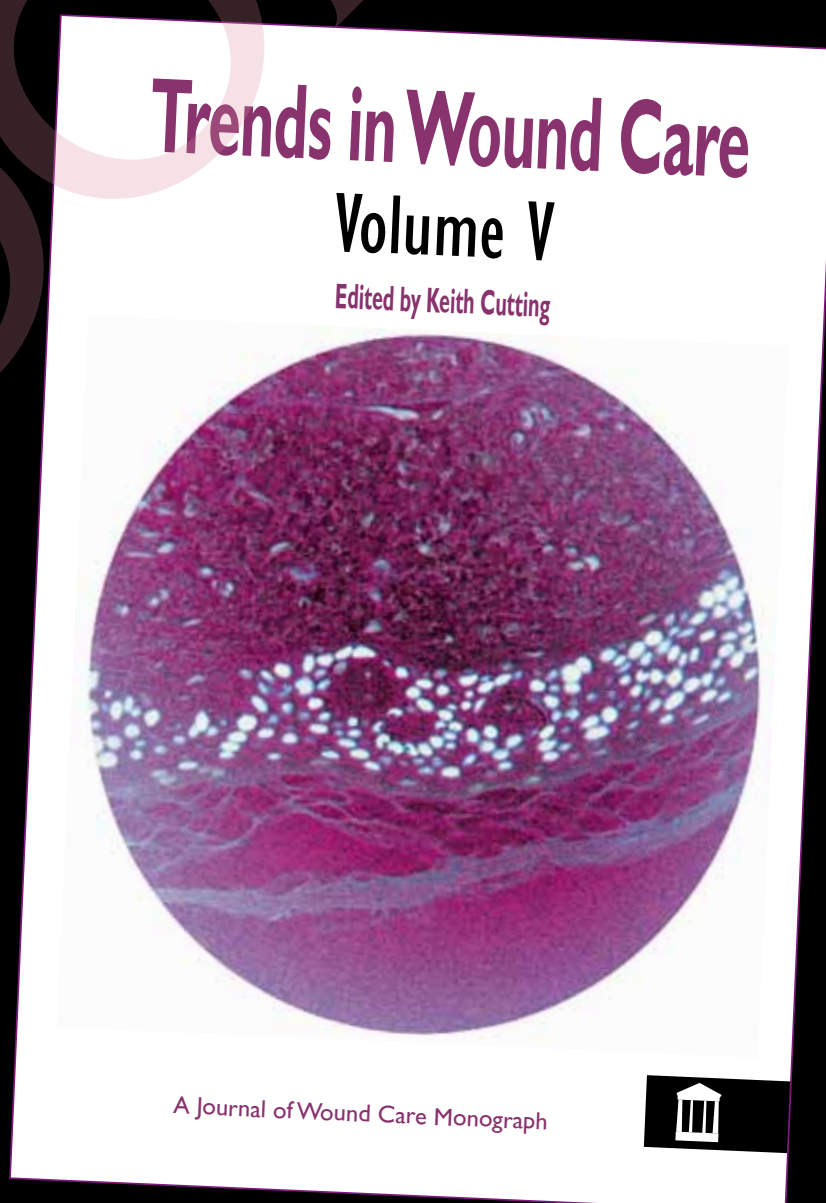
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ISBN-13: 978-1-85642-374-8; 234 x 156 mm; paperback; 120 pages; published 2009; £29.99



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