Debridement can aid the wound-healing process; where it does not occur naturally careful assessment is needed to ensure the correct method is chosen.

The role of debridement in the healing process

Debridement is a natural process that occurs in all wounds and is crucial to healing: damaged and dead tissue, debris and bacteria are removed from the wound, minimising infection risk and encouraging healthy granulation tissue to form, which aids healing (Strohal et al, 2013).

Dead tissue, slough and debris in a wound can:

- Prevent or delay a wound’s normal healing process (Weir et al, 2007);
- Mimic or hide infection;
- Attract bacteria to the wound, increasing the risk of infection (O’Brien, 2002);
- Prevent practitioners from assessing the extent and size of the wound, which is particularly problematic when staging pressure ulcer damage (Weir et al, 2007);
- Increase odour and exudate (Vowden and Vowden, 2011).

Which wounds need debridement?
Acute and chronic wounds have different requirements and heal in different ways. Generally speaking, acute wounds, such as surgical wounds, have not been present long enough to develop dead tissue and debridement is more likely to be needed to remove foreign bodies and tissue that has become necrotic. Often, this only needs to be performed once.

Chronic wounds, such as leg ulcers or pressure ulcers, often contain dead tissue and bacteria. This can be either: dry and leathery in appearance, known as eschar (Fig 1); or soft and brown, grey or yellow in colour, known as slough. Slough is made up of white blood cells, bacteria and debris, as well as dead tissue, and is easily confused with pus, which is often present in an infected wound (Figs 3 and 4). Chronic wounds are likely to need repeated debridement as part of ongoing wound care as slough tends to reappear due to the underlying cause of the wound.

Wound assessment
The decision whether to debride a wound must be based on a comprehensive wound assessment performed by a competent practitioner (Ousey and Cook, 2012). The assessment must be documented fully and should consider:

- The patient’s general condition;
- The cause of the wound;
- The patient’s circulation and, therefore, the chances of the wound healing;
- The size and location of the wound;
- The presence and amount of exudate;
- Possible infection.

When choosing a debridement method, the patient’s views and general health condition must be taken into account. For example, it would not be appropriate to debride a pressure ulcer if the patient is in the last few days of life or if debridement would increase pain.
Debride with caution if the eschar is starting to separate from the wound edges

The practitioner must also assess whether the patient’s circulation is good enough to support healing once the wound has been debrided. If it is unlikely that the wound will heal, treatment should be aimed at reducing the symptoms, such as odour or heavy exudate.

After debridement, the wound may appear to deteriorate and seem larger initially; the patient must be prepared for this.

**Types of debridement**

There are many different methods of debridement and decisions over how and when to perform the procedure will depend on:
- The available debridement methods;
- Which methods the practitioner is competent to use;
- The time available;
- The care setting – hospital or community;
- Patient preference (Flanagan, 2013).

**Autolytic debridement**

Autolytic debridement is the process by which the body uses moisture to shed dead or devitalised tissue. This can be encouraged by using dressings that promote a moist environment containing naturally occurring enzymes (Wounds UK, 2013; Gray et al, 2005).

It is generally considered a slower process than other debridement methods (Mosher et al, 1999) and the time taken to debride a wound using this method varies according to the size of the wound and amount of dead tissue.

Generally, some progress should be seen within 72-96 hours and black eschar will change to brown/grey in colour, eventually becoming stringy yellow slough (Ramundo and Wells, 2000). The wound bed needs to be reassessed at every dressing change and the combination of dressings changed accordingly.

Dressing products used for debridement fall into two categories:
- Those that add moisture;
- Those that absorb excess moisture.

If a wound is very dry, a dressing that will add moisture, such as a hydrogel, should be used. However, the wound will become wet as a result of autolysis so a secondary dressing should be used to absorb the exudate.

A common mistake is to apply a highly absorbent dressing, such as a foam dressing, over the hydrogel. The hydrogel is designed to add moisture, whereas the foam will absorb the hydrogel and dry out the wound bed (Flanagan, 2013). A combination of a hydrogel and a semi-occlusive dressing, such as a hydrocolloid, will ensure the moisture remains at the wound bed. If it contains eschar, this may need to be scored in a criss-cross way with a sharp sterile scalpel to allow the hydrogel to work; this must only be done by a competent practitioner.

For hydrogels, a coating of at least 3mm is necessary and smaller or deeper wounds may be completely filled with the gel. Hydrogel sheets should be applied so they overlap 2cm around the wound edges (Strohal et al, 2013). Wounds treated with this combination will need frequent dressing changes and extra care must be taken to protect the wound edges, which may become saturated with exudate.

For very wet or deep wounds, alginites and hydrofibres (made by ConvaTec) are useful as they fill the cavity, absorb exudate and maintain a moist environment, which aids debridement. A secondary absorbent dressing, such as foam, will control the exudate without drying out the wound.

**Surgical/sharp debridement**

Surgical and sharp debridement are considered to be the quickest ways to debride wounds but require advanced skills and must always be performed by a competent practitioner, such as a tissue viability nurse specialist or surgeon.

Surgical debridement usually takes place in an operating theatre and is used when debridement is required quickly, for example if cellulitis or sepsis are rapidly developing (Flanagan, 2013). Sharp debridement can be done at the bedside by a trained practitioner using sterile, surgical instruments. However, it is not recommended in patients’ homes due to the risk of bleeding and the need for anaesthesia (Flanagan, 2013). Fig 2 shows what a wound may look like after sharp debridement has been carried out.

**Biosurgical debridement**

Also known as larval therapy, this involves using sterile larvae (maggots) of the green bottle fly (Lucilia sericata) to debride a
wound, and provides effective, rapid debridement for sloughy, smelly or infected wounds. The method has been used for 400 years and its use is becoming increasingly common (Strohal et al, 2013).

The larvae feed on dead tissue and exudate in the wound; their secretions contain antibacterial substances that reduce bacteria, as well as chemicals that break down dead tissue while leaving healthy tissue intact (Strohal et al, 2013). The movement of the larvae within the wound also increases exudate, which washes out the wound (Strohal et al, 2013).

Larval therapy is used as an alternative if rapid debridement is required or if wounds have not responded to autolytic debridement. It can be administered by directly applying loose “free-range” maggots to the wound for three days, or using a bio bag (maggots contained in a mesh by polyvinyl alcohol net dressing) for five days.

A number of factors should be taken into account when considering larval therapy:

- Patients may experience increased pain and/or exudate, which may appear bloody but is harmless;
- Maggots are contraindicated for use near the eyes, upper gastrointestinal tract and upper respiratory tract, and in patients who have a reported allergy to fly larvae, brewer’s yeast or soya bean protein;
- Larval therapy is not suitable for: wounds with exposed blood vessels potentially connecting to deep vital organs, in patients with decreased perfusion, or in malignant wounds;
- Care should be taken in patients known to be at risk of bleeding, such as those receiving warfarin or heparin or those with a bleeding disorder, as maggots can, in rare cases, cause bleeding. If maggots are used in this patient group, the wound must be monitored carefully for excessive bleeding;
- It may be necessary to use antibiotics in conjunction with larval therapy, particularly if a Pseudomonas aeruginosa infection is present;
- Wounds must not be allowed to close over larvae;
- Larvae may drown in copious exudate.

- appropriate dressings are required to enable them to breathe;

There is a “yuck factor” for many patients and health professionals. Sterile maggots are available on FP10 prescription for use in the community. They are an expensive method of debridement, costing £58 per application loose and £99 in bagged form (UK prices in 2011). Information and specialist training is available to ensure practitioners are competent and proficient at administering larval therapy.

**Mechanical debridement**

Mechanical debridement involves using either dry or wet-to-dry gauze dressings, impregnated gauze/tulle dressings or a monofilament fibre pad to remove dead tissue. A moistened gauze pad is applied to the wound bed and, as it dries out, the dead tissue sticks to it and can be ripped off (Strohal et al, 2013; Wounds UK, 2013). This procedure is painful and also removes healthy tissue; it is not recommended for use in the UK (Wounds UK, 2013).

A monofilament pad (Debrisoft, Activa Healthcare) has recently been introduced as an alternative to gauze. The wound-contact side is fleecy in appearance and, after wetting, is gently wiped over the surface of the wound for 2-4 minutes. The manufacturer claims the fibre pad removes debris and dead tissue, leaving healthy granulation tissue intact. It is recommended that any thick, stubborn slough or hard, necrotic tissue is softened with appropriate dressings before using the pad (Strohal et al, 2013; Wounds UK 2013). This method has been found to be quick, easy to use and relatively simple.
painless, making it an ideal method for less experienced practitioners (Bahr et al, 2011).

**Advanced debridement methods**

**Ultrasound**

Alternative methods of debridement using new technology have recently become available. MIST (manufactured by Cellera-tion) delivers low-energy ultrasonic waves onto the wound bed using a mist spray, which breaks down dead tissue and helps to wash out the wound as it is debrided.

This has been found to be time consuming as it may need several applications and requires specialist equipment and training (Strohal et al, 2013; Wounds UK, 2013). It is not widely available and is only recommended for use in hospitals or clinics due to infection control issues.

**Jet lavage/hydrosurgery**

Jet lavage or hydrosurgery uses sterile water delivered to the wound bed at a high pressure to wash away dead tissue (Versajet, manufactured by Smith and Nephew). Its disadvantages are the high cost of equipment, the need for specialist training and the pain patients may experience during the procedure; it has also been suggested that the water spray could contaminate a clinical area (Strohal et al, 2013).

This method is only recommended for use in a hospital or clinic. It may be cost effective as it only needs one application and can reduce length of hospital stays (Strohal et al, 2013).

**Training and competence**

Although many of the technological methods of debridement need specialist skills or training, some, such as autolytic or larval therapy, can be performed by non-specialists.

Nurses must be competent in wound assessment to decide whether debridement is appropriate, which method to use, and whether they are competent to undertake debridement safely or a specialist referral is required (Wounds UK, 2013).

The debridement method should always be determined by the patient’s clinical need and choices, and not limited by the skills of the assessing practitioner.

**Conclusion**

This article has given an overview on wound debridement. The best possible outcomes of debridement will be achieved if the simple practice points in Box 1 are followed. NT

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**References**


