INTRODUCTION
Since the concept of wound bed preparation arose\[3\], striving to achieve a wound environment that is conducive to healing has become increasingly important\[4\]. Debridement plays a crucial role in this concept, eliminating non-viable tissue from the wound bed, which would act as a significant barrier to wound repair if not removed\[5\].

Although the term wound bed preparation is relatively modern\[3\], its underlying theoretical principles are not new\[6\]— after all, Hippocrates, the ‘father of Western medicine’, was the first to stress that the body heals itself\[7\]. However, healthcare providers are charged with enabling the process of healing to occur unhindered\[8\]. This, Hippocrates argued, takes place only through accurate assessment and diagnosis\[7\].

In modern terms, practitioners use the TIME acronym\[9\] to accurately assess the wound, identify the presence of devitalised tissue and plan appropriate interventions\[8,10\]:

- **T** = tissue (non-viable or deficient)
- **I** = infection/inflammation
- **M** = moisture (imbalance)
- **E** = edge (non-advancing or undermined).

Wound bed preparation provides a structured approach to the management of non-healing wounds, and the removal of barriers through the principles of TIME can encourage endogenous wound healing.

THE CRUCIAL ROLE OF DEBRIDEMENT
The process of wound repair involves a finely-balanced sequence of events, each stage controlled by stimulators and inhibitors that are naturally produced by the body\[11\]. In order for wound healing to progress, cells need to migrate into the wound bed and multiply\[12\].

Devitalised tissue is a barrier to cell migration and provides an ideal environment for bacterial proliferation\[13\]. The devitalised tissue prolongs the inflammatory response, enhancing the excess production of pro-inflammatory cytokines\[14\].

Cytokines, which are signalling proteins produced by cells, are a large family of diverse regulators that play an important role in wound healing\[15\]. They carry signals between cells, thereby stimulating the influx of other cells required for tissue repair. Over- or under-production of cytokines will have a detrimental effect on wound healing. This, in turn, locks the wound into a state of chronicity, thereby impeding the wound healing process\[13\].

Understanding the adverse impact devitalised tissue has on wound healing emphasises the importance of debridement in wound management\[10\]. For wounds to heal successfully, the wound bed needs to be adequately prepared and debridement is central to this process\[10\].

Current methods of debridement
Debridement may be conducted in a variety of different ways and choosing the most appropriate method depends on:

- The patient: for example, any presenting condition that may be a contraindication for use of a specific method of debridement. In addition, the patient's...
Debridement plays a crucial role in eliminating non-viable tissue from the wound bed, aiding wound repair. When selecting the most appropriate debridement technique, the competence of the practitioner is central to the decision-making process. The debridement methods most frequently seen in current practice are outlined below.

**Surgical/sharp debridement**
Excision of devitalised tissue using a scalpel or scissors\(^{17}\). This method requires skill and competence and an awareness of the potential for excess bleeding in certain patient groups\(^{18}\). Training in surgical/sharp debridement is required in order to practise safely.

**Mechanical debridement**
This involves the use of wet to dry dressings. The dressing adheres to the wound bed as it dries, thus removing the top layer of tissue as the dressing is pulled away\(^{19}\). This method is not selective, in that healing tissue may be removed alongside dead tissue\(^{19}\).

Furthermore, it is a painful procedure and, as such, is likely to cause the patient distress\(^{19}\). It is worth considering that patients rate comfort above healing in the selection of wound treatments\(^{20}\). Thus, this method of debridement may be unacceptable to some patients.

**Autolytic debridement**
Autolysis is the process of removing dead tissue from the wound using the body’s production of enzymes. These enzymes degrade the dead tissue in the presence of moisture\(^{21}\). It requires moisture, thus topical treatments that create a moist wound-dressing interface are needed. Although this method is selective, in that only devitalised tissue is removed, it is slow. However, it is considered to be relatively safe\(^{22}\). Thus, when speed is needed, this is not the most appropriate method to choose.

**Enzymatic debridement**
This involves specific enzymes being applied to the wound bed. The enzymes, such as collagenase, are similar to those that occur naturally during the wound healing process. Their primary function is to degrade the damaged extracellular matrix\(^{22}\). In order for wound healing to progress, damaged tissue needs to be removed. If this does not occur, the dead tissue acts as a barrier to cell-to-cell migration. If cells cannot communicate with each other, the production of new tissue, to replace the tissue that has been lost, will be impaired.

A systematic review by Ramundo and Gray\(^{24}\) suggests that enzymatic debridement is a useful alternative to sharp debridement, which carries the risk of bleeding. However, more often, enzymatic debridement may be used in combination with sharp technique, especially when a series of debridement treatments is required\(^{24}\).

**Larval therapy**
This method involves the use of sterile maggots from the larvae of the green bottle fly\(^{23}\). The larvae only target devitalised tissue, which they dissolve due to the presence of proteolytic enzymes in their saliva. The dissolved tissue is then used by the maggots as a source of nutrients\(^{24}\). One survey identified that patients were not resistant to the use of larvae as a treatment for leg ulcers\(^{27}\). Larvae may increase the rate of debridement of sloughy or necrotic leg ulcers compared with autolytic debridement, however, the method can be more painful\(^{28}\).

**Innovative developments**
There are a number of new products focused on wound debridement\(^{29}\). For example, the UK’s National Institute for Health and Clinical Excellence (NICE) recently reviewed a therapy known as MIST\(^{30}\), which delivers low-energy, low-intensity ultrasound to the wound bed through a continuous saline mist. The ultrasonic energy delivered to the wound is thought to stimulate wound healing, by removing devitalised tissue and bacteria, thereby enabling the wound to progress through the healing process. NICE suggests that this therapy may be a promising adjunct to current debridement methods, potentially enhancing the healing of complex, non-healing chronic wounds, when compared with standard methods of wound management\(^{30}\).

Vowden and Vowden\(^{31}\) recently reviewed another addition to the debridement armoury — a pad comprising polyester fibres that loosen devitalised tissue, while absorbing exudate and binding debris to the dressing. This method is preferable to mechanical debridement because healthy tissue is not removed with the...
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**Page Points**

1. Antiseptic cleansing is also considered to be an important component of wound bed preparation.
2. The purpose of this method of cleansing is to remove bacteria and debris from the wound — the cleansing also disrupts biofilms present on the wound surface.
3. Though water is commonly used for wound cleansing, more recently, it has been suggested that non-healing wounds may benefit from the use of more targeted cleansing solutions.

**CLEANSING**

Antiseptic cleansing is also considered to be an important component of wound bed preparation. The purpose of this method of cleansing is to remove bacteria and debris from the wound — the cleansing also disrupts biofilms present on the wound surface. A biofilm is the name given to bacteria living within an extra polymeric substance. This substance enables bacteria to attach to the wound and assists the bacteria in resisting invasion.

Though water is commonly used for wound cleansing, more recently, it has been suggested that non-healing wounds may benefit from the use of more targeted cleansing solutions. One such solution (Prontosan®; B. Braun) contains polyhexamethylene biguanide (PHMB) — an antimicrobial agent — and betaine, a surfactant. It has been shown to be effective in removing debris and bacteria, while disrupting wound biofilms. In this way, the use of antiseptic cleansing contributes to the overall goals of wound bed preparation.

**SELECTING THE RIGHT METHOD**

The competence of the practitioner is central when it comes to selecting the most appropriate method of debridement. Indeed, competence is defined as the ability to ‘practise safely and effectively within one’s own scope of practice’. Clearly, each clinician has a duty to provide wound management services in a manner that is safe and appropriate for the individual needs of the patient. Importantly, education provides the framework to ensure that actions taken are justifiable and appropriate.

Young suggests that a number of key factors should be considered when selecting the most appropriate method of debridement.
These include:
- The patient’s perspective — practitioners should identify areas of concern to the patient specialist and ensure he or she is involved in the decision-making process
- The patient’s medical state — it is important to ensure that the clinician is fully aware of the patient’s medical condition so that contraindications to treatment methods may be accounted for
- The competency of the care provider
- The environment in which care is being provided and the ease of access to specialist services[13].

These considerations underline the importance of competency and of ensuring that the safety of the patient is paramount throughout the decision-making process[40]. Indeed, Young argues that knowledge of issues regarding patient safety and clinical competence are central to the provision of effective wound management services[41].

CONCLUSION
Debridement is a key component in the wound management trajectory and today there are a wide variety of treatment methods available, including surgical/sharp debridement, mechanical debridement and autolytic debridement. Other interesting treatment choices include larval therapy and the use of ultrasonic energy. Assessment of the patient and identification of any possible contraindications to treatments is essential. In addition, consideration of competency, skills and access to specialist services is vital in ensuring that the right form of debridement is selected. Furthermore, to ensure that a patient-centred focus is adopted, it is the author’s opinion that the patient should be included in all care planning.

Central to wound management is patient safety. Equally important is the efficiency and effectiveness of the treatments used. By adhering to these points, practitioners can make the right choice for their patients[42].

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References
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