Debridement

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This article is the third in a series about the basics of wound care. The topic covered in this installment is debridement, an important part of wound bed preparation.

In the English language, the word debridement is used in the specific sense of cleaning a wound of infected, potentially infected, necrotic (dead), eschar (Figure 1), or foreign material (such as fragments of old dressings). To the best of the authors' knowledge, the word is not used in any other context in English. The word debridement comes from the French language and is even pronounced in English as a French word (de-breedment), where it means taking a bridle (the head straps that hold the mouthpiece in place) off a horse.[1]

Generally, debridement is used on chronic wounds, which means wounds that are more than 30 days old, have eschar, or show signs of infection. If a chronic wound contains necrotic tissue, it is unlikely to heal unless that dead tissue is removed. Maintenance or serial debridements have been shown to stimulate healing in chronic wounds. Debridement is not necessary in the acute inflammatory phase of normal wound healing.

It can be used acutely on contaminated wounds such as those incurred in an accident. In that case, the debridement technique would most likely include irrigating the wound with normal saline, delivered from a 50-mL syringe, or possibly with a commercial wound cleanser.

Fresh, clean wounds generally do not require debridement. Sometimes it is actually contraindicated, such as in the case of an ischemic foot wound in a patient with diabetes. Dry gangrene also is usually better left in place. This will often require removal in an operating room, typically through amputation.

FIGURE 1. Dry stable eschar with no debridement.

FIGURE 2. A wound that is appropriate for enzymatic autoltyic or sharp debridement, depending on treatment goals and the condition of the patient.

TYPES OF DEBRIDEMENT

There are 5 types of debridement. They are as follows:

Enzymatic debridement (Figure 2). This method uses enzymes in an ointment to dissolve necrotic tissue. The most common product is collagenase, which dissolves collagen. Santyl (Smith & Nephew, Fort Worth, TX) is a widely used collagenase ointment that has been in use for many years. Papaya fruit pulp, or the unripe whole fruit, has been used in traditional medicine in tropical areas as a wound treatment. It contains the enzyme papain, which has antibacterial and debridement properties.[2] It is effective and inexpensive–a rarity among wound care products. However, commercial papain urea is no longer available in the United States.

Surgical debridement. This is a surgical procedure that should only be performed by a skilled individual using surgical instruments, such as a curette or a scalpel with a No. 10 or No. 15 blade. Devitalized tissue is removed, and bleeding is generally easily controlled with a silver nitrate stick, which is a chemical cautery and sterilizing agent. A local anesthetic usually will be needed, such as 2% xylocaine with epinephrine. If anesthesia is not adequate, the patient will not want to have the procedure repeated. Surgical debridement often is followed or preceded by enzymatic debridement, which may be more effective than either one on its own.[3] Major debridement is often done in an operating room under general anesthesia.

Autolytic debridement. This is the slowest and least-effective method of debridement. It uses standard occlusive dressings such as hydrogels or hydrocolloids. The necrotic tissue dissolves underneath the dressing.

Mechanical debridement (Figure 3). This is a method of physically removing the necrotic tissue by, for example, wet to dry dressings,, which means putting a wet piece of guaze on a wound, allowing it to dry out, then removing the guaze. This usually is regarded as an obsolete

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FIGURE 3. A wound appropriate for mechanical or sharp debridement.

method because it also removes healing tissue, thereby actually delaying or even preventing healing. It is also very painful for the patient.

Biological debridement. This method uses live maggots (baby flies) from the green bottle fly. The maggots have been sterilized and then contained in a special dressing, which is then placed on the wound surface underneath a secondary dressing. The maggots selectively eat necrotic tissue and many types of bacteria. They are not effective against Pseudomonas or Proteus, both of which are often found in chronic wounds. However, they are effective against methicillin-resistant *Staphylococcus aureus*.[4] For some reason, the maggots do not touch healthy tissue. The benefit of larval debridement is that it is very effective. Drawbacks include expense, availability, and provider/patient acceptance.

FACTORS TO CONSIDER

The method of debridement should be determined by the amount of necrotic tissue, type of necrotic tissue, overall health status of the patient, and degree of pain at the debridement site. The presence of infection along with necrosis will increase the need for more urgent and aggressive methods of debridement.

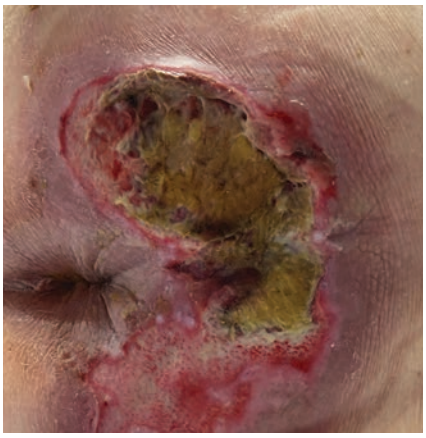

FIGURE 4. A wound appropriate for aggressive sharp debridement.

Clinicians should consider a few factors before pursuing aggressive sharp (Figure 4) or surgical debridement:

1. Goals of care. Is aggressive treatment appropriate, or is the wound not able to heal or palliative?
2. Pain tolerance. Is the patient sensate, able to tolerate pain medication or anesthesia?
3. Is the patient receiving any anticoagulation therapy that can or should be held prior to debridement? Aspirin, for instance, has an anticoagulant effect for a week after the last dose.

Sometimes debridement of any type is too aggressive and will inhibit healing, if tissue is being removed faster than it can regenerate. ■

REFERENCES

1. Debridement. *Merriam-Webster Dictionary.* https://www.merriam-webster.com/dictionary/debridement#learn-more
2. Murthy MB, Murthy BK, Bhave S. Comparison of safety and efficacy of papaya dressing with hydrogen peroxide solution on wound bed preparation in patients with wound gape. *Indian J Pharmacol.* 2012;44(6):784–787. doi:10.4103/0253-7613.103302
3. McCallon SK, Weir D, Lantis JC II. Optimizing wound bed preparation with collagenase enzymatic debridement. *J Am Coll Wound Spec.* 2014;6(1-2):14–23. doi:10.1016/j.jccw.2015.08.003
4. Bowling FL, Salgami EV, Boulton AJM. Larval therapy: a novel treatment in eliminating methicillin resistant Staphylococcus aureus from diabetic foot ulcers. *Diabetes Care.* 2007;30(2):370–371. doi:10.2337/dc06-2348

SUGGESTED READINGS

1. European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, Pan Pacific Pressure Injury Alliance. *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide.* EPUAP/NPIAP/PPIA: Washington, DC; 2014.
2. Halim AS, Khoo TL, Mat Saad AZ. Wound bed preparation from a clinical perspective. *Indian J Plast Surg.* 2012;45(2):193–202. doi:10.4103/0970-0358.101277
3. Percival SL, Suleman L. Slough and biofilm: removal of barriers to wound healing by desloughing. *Wound Care.* 2015;24(11):500–503, 506–510. doi:10.12968/jowc.2015.24.11.498
4. Newton H, Edwards J, Mitchell L, Percival SL. Role of slough and biofilm in delaying healing in chronic wounds. *Br J Nurs.* 2017;26(suppl 20a):S4–S11. doi:10.12968/bjon.2017.26.Sup20a.S4
5. Smith RG. Enzymatic debriding agents: an evaluation of the medical literature. *Ostomy Wound Management.* 2008;54(8):16–34.