



Surgically debride nonvitalized tissue and with appropriate irrigation. Significant amounts of nonviable and fibropurulent tissue must be removed surgically.

Initial aggressive debridement in the operating room with the patient under local anesthesia with sedation or under regional or **general anesthesia** is often wise. Subsequent debridement in an outpatient setting can be performed by using topical lidocaine gel or spray anesthesia and by gentle excision using iris scissors and forceps or by scraping using a curette.

Dressing changes require clean but not necessarily sterile technique.

Remove foreign bodies

Be attentive to the possibility of foreign bodies, which may prevent healing of traumatic wounds, including road debris and retained fragments of dressing materials or suture material.

Irrigate

Gently irrigate the wound with a physiologic saline solution. If cost is a major consideration, the patient can prepare a saline solution at home by using 1 gallon of distilled water and 8 teaspoons of table salt. The solution is boiled and then cooled to room temperature before use.

If surface exudate is present, consider irrigation under pressure. An irrigation pressure of approximately 8 psi can be achieved with saline forced through a 19-gauge angiocatheter with a 35-mL syringe. Pat the wound surface with soft moist gauze; do not disrupt viable granulation tissue.

Whirlpool treatment is reserved for large and infected wounds.

Provide a moist (not wet) wound bed

After debridement, apply a moist saline dressing, an isotonic sodium chloride gel (eg, Normlgel [Scott Health Care], IntraSite gel), or a hydroactive paste (eg, DuoDerm [ConvaTec]). Optimal wound coverage requires wet-to-damp dressings, which support autolytic debridement, absorb exudate, and protect surrounding normal skin.

A polyvinyl film dressing (eg, OpSite [Smith & Nephew], Tegaderm [3M]), which is semipermeable to oxygen and moisture and impermeable to bacteria, is a good choice for wounds that are neither dry nor highly exudative.

For dry wounds, hydrocolloid dressings, such as DuoDerm or IntraSite hydrocolloid, are impermeable to oxygen, moisture, and bacteria. They maintain a moist environment, and they support autolytic debridement. They are a good choice for relatively desiccated wounds.

For exudative wounds, absorptive dressings, such as calcium alginates (eg, Kaltostat [Calgon Vestal], Curasorb [Kendall]) and hydrofiber dressings (eg, Aquacel and Aquacel-AG [Convatec]), are highly absorptive and are appropriate for exudative wounds. Alginates are available in rope form, which is useful for packing deep wounds.

For very exudative wounds, impregnated gauze dressings, such as Mesalt (Scott), are useful. Twice-daily dressing changes may be needed.

For infected wounds, use silver sulfadiazine (Silvadene) if the patient is not allergic to sulfa drugs. If the patient is allergic to sulfa, bacitracin-zinc ointment is a good alternative. An ionic-silver hydrofiber dressing (Aquacel-AG) is also a good choice. [32, 33, 34, 35, 36, 37]

For chronic and stubborn wounds, the use of *Leptospermum* – or Manuka honey – impregnated products may be helpful to progress towards wound closure.

Bandaging a challenging anatomic area (eg, around a heel ulcer) requires a highly conformable dressing, such as an extra-thin hydrocolloid. Securing a dressing in a highly moist challenging site (eg, around a sacrococcygeal ulcer) requires a conformable and highly adherent dressing, such as a wafer hydrocolloid.

Hydrogel sheets and nonadhesive forms are useful for securing a wound dressing when the surrounding skin is fragile.

Consider other topical agents

Topically applied platelet-derived growth factors have a modestly beneficial effect in promoting wound healing. Becaplermin gel 0.01% (Regranex), recombinant human platelet-derived growth factor (PDGF) that is produced through genetic engineering, is approved by the [US Food and Drug Administration \(FDA\)](#) to promote healing of diabetic foot ulcers. Regranex is contraindicated in persons with known skin cancers at the site of application. Freeze-dried, platelet-rich plasma showed promise in an animal study.^[38]

Collagen comprises a significant fraction of the necrotic soft tissues in chronic wounds. The enzyme collagenase, which is derived from fermentation of *Clostridium histolyticum*, helps remove nonviable tissue from the surface of wounds. However, collagenase is not a substitute for an initial surgical excision of a grossly necrotic wound.

Other topical agents that have been used for wound treatment are sugar, antacids, and vitamin A&D ointment.

Avoid cytotoxic agents, such as hydrogen peroxide, povidone iodine, acetic acid, and Dakin solution (sodium hypochlorite).

Consider compression therapy

Consider the advisability of compression therapy. Compression is appropriate for ulcers caused or exacerbated by extremity edema. Compression may have to be avoided entirely in the presence of significant arterial inflow compromise.

Use support hose or elastic wraps with approximately 40-60 mm Hg of pressure in the absence of arterial disease and 20-30 mm Hg in the presence or suspicion of mild arterial insufficiency.

Manage pain

Manage wound pain by moistening dressings before removal. Consider using 2% topical lidocaine gel during wound care. (Anecdotal reports describe the use of topical morphine and diamorphine-infused gel for palliation of pressure ulcer pain in patients who are terminally ill,^[39] but this use is not FDA approved.)