

THE ESSENTIAL WOUND CARE SERIES

Basic Wound Care

Our team—clinicians, interns, residents, nurses—has developed an effective series outlining the fundamental steps of managing challenging wounds. This introduction gives a basic overview, while subsequent articles will detail specific wound management techniques.

Challenging wounds can be frustrating or fulfilling, depending on patient status, response to treatment, and owner finances. In reality, problematic wounds are labor-, time-, and cash-intensive (Figure 1), with no guarantee of a positive outcome. Adding to this is the wealth of available wound medications and treatment regimens.

Because clinical experience, availability of materials, and personal preferences vary, veterinarians may elect to substitute the choices described so they can develop protocols that best fit their needs and patient population.

Wound Management Checklist: The Basic Steps

- Assess the patient
- Assess the wound
- Discuss finances, time commitment, and risks with owners
- Develop a wound management plan
- Develop plans for anesthesia, analgesia, and nutrition
- Develop a monitoring plan





1

The financial, emotional, and time investments were considerable for the owners of this 12-year-old Labrador retriever; bite wounds resulted in skin loss, tissue necrosis, and antimicrobial-resistant infection.

✓ Assess the patient

Initial

Evaluate patients with particular attention to:

- Hemodynamic instability—hypotension, murmurs, tachycardia or bradycardia, arrhythmias
- Dehydration
- Pain sensation in limb injuries
- Poor body condition or muscle wasting
- Organ dysfunction, especially in kidneys or liver
- Anemia
- Hypoproteinemia
- Sepsis—indications include left shift, toxic or degenerate neutrophils, hypo- or hyperglycemia, hyperbilirubinemia, prolonged clotting times, hemodynamic instability

Additional Concerns

- Other injuries (eg, vehicular or projectile trauma, bite wounds, burns; **Figure 2**)
- Other illnesses (eg, generalized skin disease, diabetes mellitus, hypothyroidism, hyperadrenocorticism)

✓ Assess the wound

General

- Fill wound with water-soluble jelly and clip widely
 - Cover with gauze sponges or temporarily close wound
- Surgically scrub surrounding tissue



2

Five-year-old Yorkshire terrier mix severely dyspneic after cervical trauma from bite wounds. Although swelling was initially suspected to be the cause, bilateral laryngeal paralysis was subsequently diagnosed, and the patient required arytenoid lateralization to resolve clinical signs.

Laboratory

- Obtain deep tissue specimen (punch or wedge biopsy) after surgical scrub
- Submit for aerobic and anaerobic culture and sensitivity testing; if indicated, request culture for atypical organisms (eg, fungi, mycobacteria)

CONTINUES

- Obtain biopsy samples for histopathology (Figure 3) or cytology if there is:
 - Unusual wound appearance or poor progression of healing
 - Prior neoplasia
 - Suspicion of fungal organisms
 - Unusual granulation bed
 - Spontaneous eruption of new lesions



3

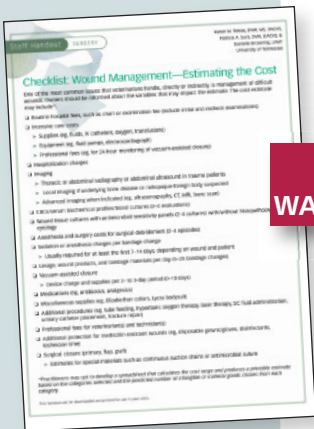
Histologic results of debrided tissues were consistent with sterile panniculitis for this 11-year-old dalmatian, in which the wound continued to enlarge despite topical and systemic therapy. The bed of the wound was firm, wrinkled, and unattached to underlying subcutaneous tissue.

Specific

- Surgically debride wound when anatomically possible and lavage thoroughly with diluted chlorhexidine solution (0.05%)
 - If heavily contaminated with debris, cleanse initially with tap water, irrigating solution, or wound cleansers
- Use open wound management with topical dressings until wound is healthy
- Administer systemic antibiotics to patients with sepsis, cellulitis, or infection that is not controlled by topical management (based on culture and sensitivity testing, when possible)
- Evaluate wound to develop alternative plans for future tension-free closure

WANT MORE?

Visit cliniciansbrief.com/journal/wound-therapy-cost-checklist to download a financial checklist on wound therapy for use in your clinic



Discuss finances, time commitment, and risks with owners

Primary Concerns

Owners should be informed of the time-intensive nature of wound management and the risks involved. In addition, initial cost estimates may change based on various factors:

- Wound assessment under heavy sedation or anesthesia
- Results of culture and sensitivity testing, systemic health of patient
- Initial response to treatment

Costs

Practitioners should consider developing a spreadsheet that calculates the cost range to produce a printable estimate; cost estimates may include:

- Routine hospitalization and intensive care
- Anesthesia and surgery
- Medications and supplies
- Fees for veterinarian and technician
- Additional protection that covers methicillin-resistant wounds (eg, disposable gowns/gloves, disinfectants)

Develop a wound management plan
Topical Treatments

Infections should be treated topically when possible:

- Lavage and debride as needed with each bandage change
- Use absorptive, wicking materials for effusive wounds
- Use dressings that encourage debridement when wounds are infected or contaminated
- Wound beds should be moist without macerating the skin
- Protect new vessels and epithelium with splints, bandages, and/or Elizabethan collars
- Additional contamination should be prevented

By Type of Wound

Infected Effusive

For infected, effusive wounds with minimal to no granulation tissue (with or without necrotic tissue), options include:

- Antimicrobial-impregnated roll gauze packing (eg, Kerlix AMD, kendallpatientcare.com) with tie-over bandage (optional) and occlusive

Indications for Wound Closure

- ❑ Good blood supply to the wound
- ❑ No infection
- ❑ Sufficient skin for tension-free appositional closure, flaps, or grafts
- ❑ Minimal health risk for anesthesia and surgery
- ❑ Financially and clinically beneficial
- ❑ High likelihood of healing success

Open wound management may be continued regardless of whether the wound is infected or not healing well or is closing quickly on its own. Owners need to be comfortable with associated costs.

drape (eg, Ioban 2)

- Change packing q12–24h, depending on amount of effusion
- Vacuum-assisted closure with bandages changed q48h

Infected Minimally Effusive

For infected, minimally effusive wounds with minimal to no granulation tissue (with or without necrotic tissue), options include:

- Honey or sugar with laparotomy pad, roll gauze, or gauze sponge packing, and tie-over bandage (optional) or occlusive drape or both (Figure 4)
- Change packing q12–24h, depending on amount of effusion
- Vacuum-assisted closure with bandages changed q48h

Necrotic

For necrotic wounds that cannot be surgically debrided, options include:

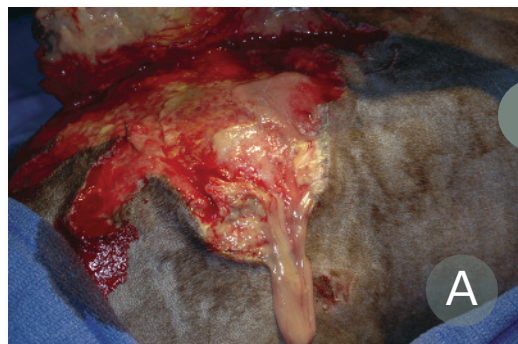
- Vacuum-assisted closure with bandages changed q48h
- Medical maggots (Figure 5)
 - Change absorptive covering q8–12h, depending on amount of effusion
 - Remove maggots 36–48 hours after placement

Infected or Colonized

For infected or colonized wounds that are starting to granulate, use a silver-coated foam pad (eg, Algidex Ag, deroyal.com) with tie-over bandage (optional) and occlusive drape (eg, Ioban 2)

- Change packing q1–5days, depending on amount of exudate and wound character

CONTINUES



4

This wound in a 7-month-old Labrador retriever was initially managed using honey on a laparotomy pad held in place with a tie-over bandage (A). The wound bed appeared much healthier after 2 days of treatment (B).



B



5

Tissue necrosis extended deep into the distal antebrachium after palliative radiation therapy. The area was treated with medical maggots (seen here), and the majority of necrotic tissue was gone within 2 days.



6

A petroleum-impregnated dressing was stapled over the mesh graft in this 10-year-old golden retriever. The outer surface of the dressing was coated with triple antibiotic ointment and covered with an absorptive bandage; the stapled dressing was left in place. The area completely healed within 14 days.

With Granulation Beds

For wounds with formed granulation beds, use nonadherent fine-pore dressing (eg, Telfa, kendallpatientcare.com) with triple antibiotic coating and petroleum-impregnated dressing (eg, Adaptic, systagenix.com); **Figure 6**

- Change bandage q2–5days, depending on amount of exudate and wound character
- Although petroleum may cause delayed epithelialization, removing a dry pad may cause discomfort and significant disruption of delicate tissue

Epithelializing

For epithelializing wounds, use a nonadherent pad with a thin layer of ointment (eg, triple antibiotic) or a petroleum-impregnated dressing (eg, Adaptic, systagenix.com)

- Change bandages q2–5days, depending on amount of exudate and wound character
- Moderate to extreme amounts of topical ointments may cause maceration of surrounding epithelium and delay wound healing
- Wounds with a thin margin of new epithelium are likely ready to surgically close; this stage of bandaging is therefore more important for wounds that heal by second intention

Maturing

For maturing wounds (second-intention healing), use a nonadherent pad with thin layer of ointment and petroleum-impregnated dressing

- Change bandages weekly, depending on wound character, bandage status, and need for rechecks

Develop plans for anesthesia, analgesia, and nutrition

Anesthesia

Define anesthesia protocols for wound debridement and bandage changes tailored to each patient based on initial assessment

Analgesia

Maintain analgesia throughout long-term therapy

Nutrition

Develop a nutritional plan to support the patient

- Plan how to meet caloric needs if daily sedation/anesthesia is required

Develop a monitoring plan

Close Observation

Monitor body condition score (BCS) and watch for evidence of systemic illness via serial CBC and serum biochemical profiles

- Use serum biochemical profiles to monitor organ function and protein concentrations
- Use CBC results to monitor for evidence of sepsis and anemia

See Aids & Resources, back page, for references & suggested reading.

Causes of Delayed Healing

- Infection**
- Foreign body reaction—both environmental (eg, grass awns) and surgical (eg, suture, drains, orthopedic wires)**
- Trauma, whether from patient or procedure**
- Excessive motion**
- Immune dysfunction**
- Glucocorticoids or chemotherapy**
- Neoplasia**
- Drug reaction**
- Tension**
- Hypoproteinemia**
- Nutritional deficiencies**

FOR MORE...

Look for the next articles in **The Essential Wound Care Series** in upcoming issues