

Overview

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Bite wounds constitute 10%–15% of acute injuries in dogs and cats admitted to veterinary practices.¹ All bite wounds warrant veterinary attention, regardless of severity, because they can be life-threatening, especially if significant thoracic or abdominal trauma has occurred. Dog bite wounds are often characterized by significant tissue trauma resulting from the compressive and crushing forces of tearing. Cat bite wounds are less traumatic, but are often associated with severe local infection. Cat bites are typically puncture wounds, and their quick-sealing nature causes bacteria from the teeth to be maintained within the tissue. Any bite wound can result in significant pain, trauma, infection, distress, and fearful behavior.

for other wounds. Bloodwork provides information about the patient's status and candidacy for anesthesia. Diagnostic imaging permits assessment of trauma to deeper tissues and body cavities. Surgical exploration is not only therapeutic, but can also be diagnostic of the extent of injury.

TREATMENT

Pain medication and antibiotics are the mainstays of treatment. Extensive surgical debridement with intensive care monitoring may be necessary. Some patients may require long-term open wound management until the tissues are healthy enough for closure.

IMPACT

Case management, financial costs, and prognosis vary widely based on injury severity. Because of the potential for rabies transmission, bite wounds can have serious legal and public health ramifications. Bite wounds are traumatic for the patient and client, and can have dire consequences if the wounds are severe or managed inappropriately. Each team member plays a vital role in providing quality care that results in the best possible outcome for these patients.



Bite wound to the perineum of a dog. The primary concern is injury to deeper structures.

EXAMINATION & ASSESSMENT

On presentation, the receptionist should ask the client:

- *When did the bite occur?*
- *Was the attacker a domesticated or wild animal?*
- *Do the attacker and your pet have proof of rabies vaccinations?*
- *Does your pet have any current medical conditions?*

In addition to physical examination, diagnostic investigation may include radiographs, ultrasound, bloodwork, and surgical exploration. An unimpressive surface wound often overlies severe tissue and organ damage, a phenomenon described as the “tip of the iceberg.” Team members should triage the patient, evaluate the extent of damage, and look

STEP 2
Team Education Primer ►

Team Wound Management Plan

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Do not proceed with wound management until the patient is stable and life-threatening trauma (eg, neurologic damage, abdominal cavity penetration) is ruled out. Consider imaging (eg, radiographs, ultrasound, computed tomography) if thoracic, abdominal, orthopedic, or spinal injuries are suspected. Take photographs if legal action is anticipated.

Use opioids for initial pain management. A fentanyl-lidocaine constant rate infusion provides adjustable analgesia in dogs.

Fresh superficial wounds may not require systemic antibiotics if appropriate cleaning is performed; however, infection is common in delayed presentations with extensive tissue trauma, or in immunosuppressed patients. *Staphylococcus*, *Streptococcus*, and *Pasteurella* spp are common infectious agents in dog bites; they are typically susceptible to amoxicillin-clavulanate or potentiated sulfas. *Pasteurella multocida* is the most common infectious agent in cat bites; it is



Bite wound on the antebrachium of a bobcat. It is important to assess the neurologic function and obtain radiographs of the limb to provide the best treatment and prognosis.

typically susceptible to amoxicillin.² Administer IV ampicillin-sulbactam until oral medication is possible while awaiting culture and sensitivity results. Patients may be at risk for resistant infections if they are receiving immunosuppressants, have systemic illness, recently received antibiotic treatment, or their owners are potential carriers of methicillin-resistant organisms (eg, they work in a medical field).

Cover wounds with sterile dressings until the patient is stable. Clip, clean, and aseptically probe wounds while the patient is under anesthesia. If subcutaneous areas are not easily visualized, incise the skin between the puncture wounds. Remove dead, necrotic, or severely damaged tissue with sharp dissection. For questionable or vital tissue (eg, areas around tendons or nerves), perform open wound management and reassess in 12–24 hours.

Lavage wounds thoroughly with tap water, sterile saline, or 0.05% chlorhexidine solution. In humans,

using tap water for wound lavage does not increase the risk of infection.³ Obtain deep tissue samples for aerobic and anaerobic culture after surgical preparation of the skin.

Leave puncture wounds open. Close larger wounds if they are healthy and adequately cleaned and debrided. If dead space is present, place a drain before closure.

Use open management for infected wounds or those containing necrotic, devitalized tissue. Place an antimicrobial dressing (eg, honey, silver) within the wound bed; cover the dressing with an absorptive layer; and secure the dressing with an adhesive drape, tie-over bandage, or self-adhering wrap. Change bandages before strike-through occurs. Close wounds when they have a healthy bed of granulation tissue and no evidence of infection. New epithelium around the margins also signals that closure is possible.

Negative pressure wound therapy, also known as vacuum-assisted closure, may be beneficial for extensive bite wounds, particularly large wounds (>5 cm) of the trunk and proximal limbs. This well-tolerated therapeutic technique promotes rapid formation of granulation tissue, decreases periwound edema, and initially reduces the wound's size. These benefits may allow earlier wound closure and faster recovery compared with traditional wound care.⁴

STEP 3
Communication Keys ►

Obtain Information, Comfort Clients

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Successful practices maintain core values and standards to enhance patient care and client experience. To set your practice apart and maintain client loyalty, perfect the fundamentals of communication. Ensure that team members understand the importance of thoroughly assessing all bite wounds as quickly as possible. Emphasize that an unassuming bite wound may mask underlying life-threatening trauma.

Comfort emotional clients with empathy and praise. For example, when finding a client alone in the examination room, reflect her body language and speak compassionately (eg, *Obviously, you are concerned about Maggie. It can be upsetting to see your pet get hurt. Thank you for contacting us; you did the right thing*). Smile, pat the client's shoulder, and offer her a tissue.

Ask open-ended questions to attain as much information as possible. Instead of asking, *Was she attacked by a cat or a dog?*, say, *Tell me about the attack*.

Make sure to ask the client about these important details:

- **Injury circumstances:** When and how did the injury occur? Was the attacker provoked? Where are the wounds located?
- **Attacker details:** Was the attacker stray, owned, or wild?
- **Vaccination status:** What is the status of the patient's rabies vaccination? Of the attacker's?

Provide an agenda for the visit and explain the purpose of the examination (eg, *To make sure Maggie's wounds are not more extensive, the veterinarian will*



Bite wound on the thorax of a dog. Obtain thoracic radiographs of any traumatic injury involving the chest area to assess for intrathoracic complications (eg, fractured ribs, pulmonary contusions, pneumothorax, pleural effusion).

perform a thorough examination. This will help determine what treatment or diagnostics, such as x-rays, are required. Sedation may be needed to keep her comfortable. I will speak with you when we have more information).

Partner with the client during decision-making while also respecting financial considerations (eg, *After we get the results, we can make a collaborative decision about the treatment and diagnostics that should be prioritized and review an estimate for the care*).

Learn to identify potential issues that you can help resolve before they become a problem. Share information about bite prevention and behavior modification (eg, *You never know when a bite incident may occur; here is some information that may help if this situation arises again*).

STEP 4 Team Workflow ►



READ ALL ABOUT IT

- **Bite wounds in dogs and cats.** Holt DE, Griffin G. *Vet Clin North Am Small Anim Pract* 30:669-679, 2000.
- **Dog bite wounds: A study of 93 cases.** Cowell A, Penwick R. *Comp Cont Ed Pract Vet* 11:313-320, 1989.
- **Dog-bite wounds: Bacteriology and treatment outcome in 37 cases.** Griffin GM, Holt DE. *JAAHA* 37:453-460, 2001.

Team Workflow

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RECEPTIONIST

- ✓ If the client calls before arriving, obtain essential patient information (eg, heavy blood loss, difficulty breathing); warn that the patient may be painful and could become aggressive; and instruct the client to apply pressure to the wounds with a clean towel if the patient is bleeding
- ✓ Greet the client and patient and inform the veterinary technician of their arrival
- ✓ Immediately escort the patient and client to the examination room to minimize stress
- ✓ Provide comfort by offering water or tissues, especially when the client is emotional

TECHNICIAN/ASSISTANT

- ✓ Wear examination gloves before handling the patient to reduce the risk of contamination
- ✓ Triage the patient by checking the airway, breathing, and circulation and obtaining the patient's vitals (eg, temperature, pulse, respiration, weight)
- ✓ If the patient is critical, acquire a resuscitation code from the client and stabilize the patient
- ✓ Muzzle the patient if necessary
- ✓ Provide immediate intervention for serious injuries (eg, flow-by oxygen for a dyspneic patient)

VETERINARIAN

- ✓ Perform a comprehensive physical examination wearing gloves
- ✓ Discuss the assessment plan, treatment options, and finances with the client
- ✓ Administer the appropriate pain control and antibiotic therapy
- ✓ Consider sedation and analgesia, diagnostic imaging, and wound cleaning to explore the injuries
- ✓ Communicate any concerns regarding rabies and public health; implement appropriate rabies protocol and quarantine based on the vaccination status of the patient and the attacker
- ✓ Educate the client about avoiding bite wounds and handling future animal interactions

RECEPTIONIST

- ✓ Schedule a recheck appointment and collect payment

PRACTICE MANAGER

- ✓ Consult the local police if the client wishes to pursue legal action against the attacker's owner
- ✓ Consult the public health department if the attacker was a wild animal
- ✓ Ensure the medical records are complete and detailed
- ✓ Advise the client to seek medical attention if he or she was bitten by an animal

STEP 5 Team Roles ►

Team Roles

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TEAM MEMBER	ROLE	RESPONSIBILITIES
RECEPTIONIST	Communication & client relations expert	<ul style="list-style-type: none"> ✓ Provide initial instructions to the client for patient transport and holding ✓ Facilitate communication between the client and the team; assist the client during the examination ✓ Verify the client's contact information ✓ Initiate paperwork, get forms signed, take deposits, and arrange payment ✓ Direct the client to ancillary services, particularly if the client has suffered physical or emotional injury ✓ Facilitate a patient referral when specialty care is needed ✓ Make sure the patient is kept away from other patients in the reception area or is escorted to an examination room
TECHNICIAN/ ASSISTANT	Technical expert, patient caretaker, client educator	<ul style="list-style-type: none"> ✓ Triage the patient and initiate emergency supportive care ✓ Obtain the patient's history and perform ancillary diagnostics ✓ Verify the patient's vaccination status ✓ Provide care based on the veterinarian's directives ✓ Document all clinical findings, diagnostic results, treatment, client communication, and photographs of the injuries (when indicated) in the medical record ✓ Educate the client about home nursing and follow-up care ✓ Initiate follow-up communication with the client after the patient is discharged
VETERINARIAN	Medical expert, client educator	<ul style="list-style-type: none"> ✓ Perform a full physical examination and interpret the diagnostic results ✓ Develop orders for medical therapy, analgesia, and wound management ✓ Perform debridement and surgical procedures ✓ Document all test interpretations, diagnoses, prognoses, and client communication in the medical record ✓ Discuss the assessment, treatment options, and prognosis with the client ✓ Recommend referral when specialty care is needed ✓ Provide expert information on rabies prevention and control
PRACTICE MANAGER	Organizational & financial expert, troubleshooter	<ul style="list-style-type: none"> ✓ Familiarize team members with their roles in emergency situations, as well as methods for handling conflict and emotions ✓ Develop situational practice policies and protocols (eg, treatment for unvaccinated patients, recommendations to injured clients, protocol for potential rabies exposure, payment plans) ✓ Provide expertise on financial issues ✓ Develop methods for providing accurate estimates ✓ Ensure appropriate documentation for possible legal action, including dated images⁵

STEP 6
Team Training Plan ►

Team Skills

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A compassionate, educated team equipped with the skills necessary for addressing a multitude of situations is invaluable. Regular training and evaluation ensures a knowledgeable team that can effectively manage a bite wound case and communicate with a client about his or her pet before, during, and after the visit. Design a team meeting geared toward training and practice for managing bite wound cases. The following are ways the practice manager and veterinarian can educate the team about managing these cases:

PRACTICE MANAGER

- Create estimates for different treatment plans.
- Employ effective communication skills to support clients.
- Offer team resources, such as training or behavior modification, to avoid bites and manage aggression.
- Develop estimate templates for bandage changes and follow-up visits to help clients understand their commitment that may be necessary to ensure a successful outcome for their pet.



Multiple bite wounds on the hindlimbs of a dog. It is difficult to assess the ultimate size and depth because viability cannot be accurately assessed while traumatized skin is intact.

VETERINARIAN

- To save time, prepare a general patient stabilization treatment plan for emergencies.
- Clarify home care and follow-up for bandages and drains.
- Demonstrate recognition and handling of painful patients to prevent further injuries and ensure team safety.
- Describe different wound types, treatments, and bandaging techniques.
- Develop a nosocomial infection control protocol.
- Discuss methods for reducing wound contamination before and during treatment.
- Educate the team about teaching clients how to recognize and remove pets from potentially stressful situations that may prompt a bite.
- Explain how to triage a bite wound, including examining patients for dyspnea, pale mucous membranes, altered mental status, severe pain, significant trauma, and hemorrhage.

- Gather information related to state and local rabies laws, including contact information for a public health official.
- Share bite prevention guidelines for humans.

PRACTICE MAKES PERFECT

Rehearse a mock bite wound case, making sure all team members can implement their roles. Practice the communication script as developed in Step 3 (page 31). Provide constructive feedback about what was done well and what improvements are needed after a rehearsal or an actual event. Repeat the training with new team members until everyone is familiar with his or her role in treating bite wound patients successfully. ■

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

STEP 7
Client Handout ►

Frequently Asked Questions: Bite Wounds

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1 Do all bite injuries require veterinary attention?
It is important that a veterinarian perform a full physical examination on any patient that has suffered a bite wound because the smallest wound may be just the tip of the iceberg.

2 What should I do before I bring my pet to the veterinarian?
Use special care when handling and transporting your pet because he may be painful or distressed from the trauma. Because animals may bite their owner under stressful circumstances, a muzzle may be required. Safely place your pet in a carrier or wrap him in blankets and towels for security while in transit.

Acquire as much information as possible about the attacker. If the attacker was an owned animal, gather its health records and proof of rabies vaccination. The attacker should also be examined by a veterinary professional for subtle injuries. Contact your local police if you wish to pursue legal action. If the attacker was a wild animal, contact your local animal control agency to report the incident and have the animal captured for rabies testing, if possible.

3 Will my pet need to be revaccinated for rabies?
If your pet has *never received a rabies vaccination* and is bitten by a potentially rabid animal, immediate euthanasia and rabies testing is indicated. If you are unwilling to take these steps, your pet may enter strict isolation for 6 months, with a rabies vaccination administered at the onset of the isolation period or one month before release.

If your pet is *past due for a rabies vaccination* and is bitten by a potentially rabid animal, protocols will be implemented on a case-by-case basis, depending on state regulations; typical protocols include observation, isolation, and revaccination.

Any pet that is currently *up-to-date on the rabies vaccination* and bitten by a potentially rabid animal should be revaccinated immediately and monitored for 45 days.¹

Note: These guidelines are based on the 2011 Compendium of Animal Rabies Prevention and Control,¹ but regulations may vary from state to state. Consult your public health official for the most accurate and up-to-date local recommendations.

4 How do I prevent bite wounds?
Keep your pet on a leash or closely monitored at all times. Be aware of your pet's response to other animals and avoid interactions with unfamiliar animals. Remove your pet from stressful situations before conflict arises.

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