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Bite Injuries

[Link to Bite Injuries Flow Chart](#)

Introduction

Bite injuries are a common presentation to Emergency Departments (ED) and account for around 1% of all presentations.¹

20% of bites require medical attention. The incidence of different types of bite injuries varies. It is estimated that dog bites account for 60 – 90%, cat bites 5 – 20% and human bites for 4 – 23% of all bite injuries.² Other bite wounds such as seal, reptile, and snake bites are still rare in Ireland but increasing as people are keeping exotic animals as pets. The highest incidence of bite injuries is among boys 5 – 9 years old.³

Wound infection is the most common complication, occurring in 2 – 30% of dog bites, 15 – 50% of cat bites and 9 – 50% of human bites.²

Key points of treatment are appropriate wound care with an emphasis on wound irrigation. The use of prophylactic antibiotics is controversial and only indicated for high risk wounds. A decision to close a bite wound must weigh the benefit of improved cosmesis against the increased risk of infection, and should usually be undertaken after review by a specialist team.

Aim

The aim of this guideline is to standardise the treatment of different types of mammalian bite injuries (dog, cat, human, and other bites) according to best available evidence.

Definition of Terms

Infection is defined as⁴:

- Presence of erythema
- Tenderness beyond that expected at 24 hours
- With / without purulent discharge
- Cellulitis
- Lymphangitis
- Abscess formation

Assessment

When taking a history the following details are important to ask:

- Source of bite
- Time of injury
- Site, number, and depth of bite
- Tetanus and hepatitis status (hepatitis status only in human bites)
- Immunodeficiency

Initial assessment of a bite wound should include the following:

- Location of wound
- Size and depth of the wound
- Degree of injury (devitalized tissue, nerve or tendon damage, involvement of bones, joints, blood vessels)
- Presence or absence of infection
- Foreign body

Management of Bite Wounds in the Emergency Department

When dealing with any trauma patient the first priority is always to stabilise Airway, Breathing, Circulation, Disability and Environment (ABCDE) according to the ATLS protocol as required before concentrating on the wound itself.

1. Encourage wound to bleed if recent injury

2. Irrigate the wound thoroughly

- Apply L.A.T. as local anaesthetic
- High pressure irrigation with NaCl 0.9% (use a 20 ml syringe connected to plastic part of 20G IV needle)

This has been shown to be the most important factor to reduce wound infection and decreases the risk fivefold.⁵ High pressure irrigation is more effective at preventing infection than low pressure irrigation.⁶

3. Perform an x-ray if one of the following present:

- Suspected radio-opaque foreign body
- Joint involvement (look out for air)
- Suspected fracture / dislocation

4. Check tetanus status and risk of viral infections:

- Give vaccination and TIG as indicated according to EMIT Toolkit (<http://www.hpsc.ie/A-Z/EMIToolkit/EMIToolkit.pdf>)
- Transmission of viral hepatitis and HIV can occur in human bite injuries.
- Ireland is officially rabies free, check HSE website in case of suspected rabies infection.

5. Evaluate low or high risk wound:

Low risk wound	High risk wound
<ul style="list-style-type: none"> • Bite wound < 24 hours • No signs of infection • No bone, tendon, joint involvement • No puncture wound • Does not involve hand • Immunocompetent 	<ul style="list-style-type: none"> • Bite wound > 24 hours • Signs of infection • Bone, tendon, joint involvement • Puncture wound • Involves hand • Immunosuppression

6. Treatment with antibiotics

- The use of prophylactic antibiotics is not associated with a statistically significant reduction in infection.
- A 1994 meta-analysis⁷ and a 2001 Cochrane systematic review⁸ failed to demonstrate a benefit for prophylactic antibiotics other than for hand wounds and puncture wounds.
- Treatment with antibiotics is therefore not recommended for low risk wounds.
- Prophylactic antibiotic treatment is only recommended for high risk wounds (as defined in table above). Prescribe Co-Amoxiclav x 1/52 or Metronidazole plus Doxycycline in penicillin allergy 1/52.² The first dose of antibiotics should be given in the Emergency Department. Evidence shows reduced rate of infection the earlier the antibiotic was given.⁴
- Reptiles and in particular seal bites have unusual microbiology that is resistant to most antibiotics (seek specialist advice from ID team).

7. Primary wound closure

Several studies have demonstrated that wounds can undergo primary closure immediately after thorough irrigation and debridement without disadvantages. This is often associated with better wound healing and no increased risk of infection.^{9,10}

Bite wounds (dog, cat or human) to the face should not be closed in the Emergency Department, They may require extensive irrigation and debridement in theatre For some such wounds it may be preferable to leave the wound open (after irrigation) and allow spontaneous healing with appropriate follow up/scar revision if necessary.

Discuss every wound closure with the ED Consultant or Plastics team.

NICE guidelines suggest the following low risk wounds can be considered for primary closure:

- Fresh bite wounds (less than 6 hours old) where there are no risk factors for infection.
- Bite wounds which are between 6 and 24 hours old where there are no risk factors for infection. However this is controversial and currently there is no consensus of opinion.

Risk factors for infection²

a. People factors

- Individuals who are diabetic, asplenic, cirrhosis of the liver, or immunosuppressed or who have lymphoedema after radiotherapy.

b. Wound factors

- Hand wounds are more likely to become infected.

c. Risk of infection is also particularly high in:

- Wounds more than 6 hours old.
- Previously-sutured wounds.
- Puncture wounds.
- Full-thickness wounds.
- Wounds with devitalized tissue.
- Wounds involving joints, tendons, ligaments, or fractures.
- Wounds in the foot or over a joint.
- Wounds on the scalp or face of an infant.
- Crush injuries.

No primary closure is recommended if any of the following are present:²

- Bite wounds over 24 hours old
- Infected bite wounds
- Deep puncture wounds

8. Refer to specialty team for definite wound care if appropriate:

Hand	Plastics
Facial (Cosmetic Sensitive Triangle)	Plastics
Limb (excluding hand)	Orthopaedics
Trunk (incl. inguinogenital)	General Surgery
Facial (not including Cosmetic Sensitive Triangle)	General Surgery
Scalp	General Surgery

9. Patient discharge advice

Always advise parents to look out for signs of infection (such as erythema, discharge, cellulitis, lymphangitis, and abscess formation) and return to the GP or Emergency Department if any signs present. Give parent information leaflet.

Special Considerations

Special considerations regarding treatment with prophylactic antibiotics are valid for immunocompromised patients. The risk of infection is increased in people who are diabetic, asplenic, cirrhotic or patients who have lymphoedema after radiotherapy. Those patients should therefore be treated with prophylactic antibiotics even if they sustained low risk wounds.²

[Link to Evidence Table](#)

[Link to Parent Information Leaflet](#)