LRI Emergency Department and Children's Hospital

Treatment of Human or Animal Bites

Staff relevant to:	Health care professionals working within UHL Children's ED and Children's Hospital
Team approval date:	October 2024
Version:	2
Revision due:	October 2027
Written by:	Prerna Patel, Sabrina Sequeira, Ruth Radcliffe, Sharon Koo, Amy Atkinson
Trust Ref:	D1/2023

1. Introduction and Who Guideline applies to

A bite is an injury inflicted by the teeth of a human or an animal. Bite wounds can take a number of forms including lacerations, puncture wounds, crush or degloving injuries. This guideline should be used by Health care professionals working within UHL Children's ED and Children's Hospital when treating people with human or animal bites, their families and carers.

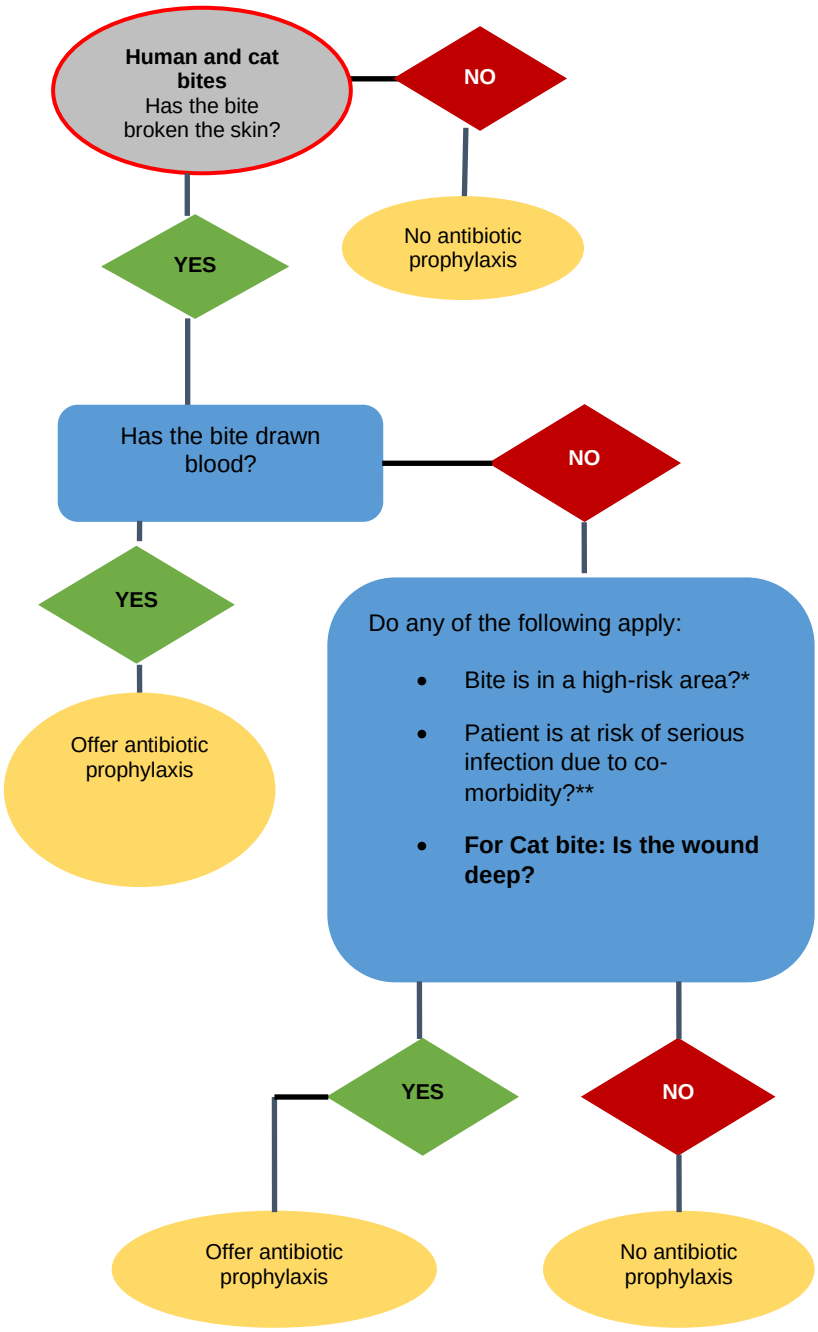
KEY POINTS:

- Dog bites are the most common mammalian bite.
- Take detailed history to identify who needs further investigations outlined below.
- Bacterial infection is a risk if there is a break in the skin. Infective complications resulting from a bite wound include abscesses, tenosynovitis, septic arthritis, osteomyelitis, necrotising fasciitis and systemic spread (e.g. meningitis, endocarditis, and organ abscesses).

- Assess tetanus status. Please refer to appendix 1. Tetanus can occur after an animal or human bite, especially in puncture wounds or those containing devitalised tissue, dirt, or foreign bodies. However, tetanus after a human bite is extremely rare.
- Rabies is very rare in the UK as there is no indigenous rabies in terrestrial animals (although bats are a risk). It usually occurs after a person is bitten or scratched by an animal that is infected with rabies.
- Remember to consider any safeguarding issues and involve safeguarding team appropriately.
- Seek specialist advice if unsure.

Contents

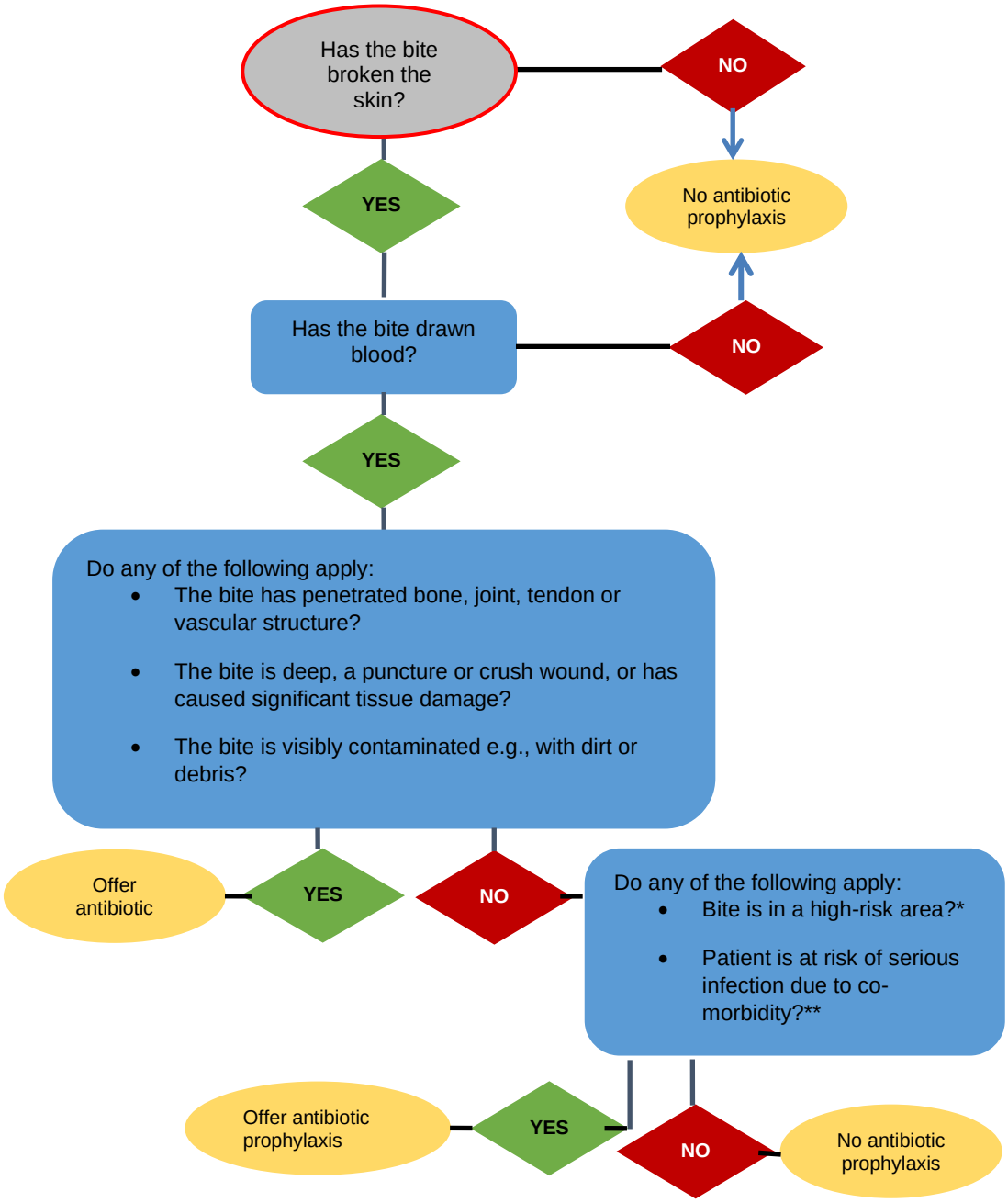
Flow Chart 1: Uninfected Human and cat bites



*High risk areas: the hands, feet, face, genitals, skin, overlying cartilaginous structures or an area of poor circulation.
**High risk patients: co-morbidities – diabetes, immunosuppression, asplenia or decompensated liver disease.

Flow Chart 2: Uninfected Dog and other traditional pet bites (excluding cat

bites)



*High risk areas: the hands, feet, face, genitals, skin, overlying cartilaginous structures or an area of poor circulation.
**High risk patients: co-morbidities – diabetes, immunosuppression, asplenia or decompensated liver disease.

2. Assessment, treatment & management of human or animal bites

2.1 HISTORY

What, How, Where and When

- Type of bite: e.g., human, animal -wild or domestic animal, insect.
- Severity of bite: Site and depth of the wound
- Consider the impact on underlying and surrounding tissue
- Crush injury (e.g., bite from a large dog)
- Possible underlying bone fracture
- Timing: Any recent foreign travel. Bites abroad increase the risk of infection with a multi-resistant organism or rabies.
- Immunisation status: tetanus, rabies, blood borne viral infection
- Medical comorbidities: e.g., diabetes, immunosuppression, asplenia or decompensated liver disease
- Think of potential safeguarding issues in children and vulnerable adults

2.2 EXAMINATION

Look, Feel, Listen, Move

Remember:
1. Photographs or illustration of wound can be very helpful
2. Carefully explore even apparently minor injuries – consider appropriate analgesia/local or general anaesthetic.

Look:
Location of the wound
Extent of the wound
depth and width
degree of penetration, skin, muscle, bone tendons, nerves, blood vessels, central nervous system
Skin – intact/broken, bruising
Wound edges – irregular, crushed
Pain, swelling, erythema, discharge from the wound
Any foreign body
Signs of cellulitis
Signs of allergic reaction
Lymphadenitis

Feel:
Tenderness
Warmth – especially over joints
Swelling/crepitation/bogginess

Move:
Joint above and below
Range of movement
Pain
Tendon function
Neurovascular function

Note for signs of infected wound: inflammation surrounding the wound, fever, discharge, unpleasant smell, increased pain

2.3 INVESTIGATION

- Most bites do not require further investigation.

- **X-ray**
  In cases of suspected fractures/deep tissue involvement or foreign body.

- **Ultrasound**
  Can be used for possible soft tissue injury when a non-radiopaque foreign body is suspected.

- **Blood test**
  Only indicated if patient is systemically unwell/life-threatening injuries.

- **Wound swabs for culture**
  Needed if there is a discharge (purulent or non-purulent).
  Review antibiotic choice based on swab cultures.

2.4 MANAGEMENT

- Any life-threatening injuries should be treated according to standard guidelines.

- Use local anaesthetic or refer for general anaesthetic if extensive injury.

- Remove any foreign bodies.

- Irrigate and clean the wound thoroughly with water or normal saline. Use enough fluid to remove all dirt and foreign material.

- Debride any non-viable tissue.

- Assess need for antibiotic treatment or prophylaxis (below)

- Assess if tetanus prone wound (See appendix 1)

2.5 ANTIMICROBIAL PRESCRIBING: for 18 years and under

Uninfected bites:

- See Flowchart 1 and 2 for treatment pathway for uninfected wounds.

- See Table 1 for choice of antibiotics.

Overall, if the bite has not broken the skin, prophylactic antibiotic is not needed. If the bite has broken the skin but not drawn blood (i.e., superficial abrasion), then it is considered low risk because it will not have penetrated the dermis. Hence these wounds also do not always require prophylaxis.

However, site and depth of the bite affects the risk of infection. Wounds to feet, face, skin overlying cartilaginous tissue (low blood supply), hands (multiple small compartments and number of joints) are considered to be at high risk of infection.

Cat bites are considered as high risk of infection because of cat oral bacteria and because the needle-like small deep puncture wounds. They are often deeper than it appears and hence difficult to irrigate and clean.

Infected bites:

- Give antibiotics to all infected wounds. See Table 1 for choice of antibiotics.

Antibiotics should be offered for human and animal bites with symptoms and signs of infection, such as **inflammation surrounding the wound, fever, discharge, unpleasant smell, increased pain**

If there is purulent or non-purulent discharge, wound swabs should be sent for microbiology prior to starting antibiotics. Certain bacteria, like Eikenella may not form pus.

Seek specialist advice for bites from wild and exotic animals, including birds and non-traditional pets, such as snakes, lizards, monkeys and bats. There may be different spectrum of bacteria involved and risk of other non-bacterial infections. For example, monkey bites are associated with herpes B virus, which may have serious consequences if not treated early.

Seek specialist advice for animal bites (including farm animal bites) you are not familiar with.

Rabies risk – if bite occurred abroad, or is from a bat contact the Rabies and Immunoglobulin service on 0330 128 1020
https://www.gov.uk/government/publications/immunoglobulin-when-to-use/rabies-and-immunoglobulin-service-rigs

Table 1: Antimicrobial prescribing for Human and animal bites

Prophylaxis and Treatment	**Antibiotic, dosage and course length for prophylaxis (3 days) and treatment (5 days)*** **Dosage from BNFc**
Children under 1 month	Seek specialist advice: Likely will need intravenous antibiotics to ensure compliance
First choice oral antibiotic for child >1month age	**Co-amoxiclav**
Alternative choice oral antibiotic Child <12 years (if penicillin allergy or co-amoxiclav unsuitable)	**Co-trimoxazole** *(off-label use - see BNFc for monitoring requirements)* AND **Metronidazole** Note: co-trimoxazole alone does not have adequate anaerobic cover. Co-trimoxazole is not licensed in <6 weeks old infant.
Alternative choice oral antibiotic Child 12–17 years (if penicillin allergy or co-amoxiclav unsuitable)	**Doxycycline *with* metronidazole**
First choice intravenous antibiotic (unable to take oral or severely ill) (child aged >1 month and <18 years)	**Co-amoxiclav**
Alternative choice of intravenous antibiotic (non-anaphylactic penicillin allergy or co-amoxiclav unsuitable) (child aged >1 month and <18 years)	**Cefuroxime** (can be converted to Ceftriaxone if ambulating but IV still required) AND **Metronidazole** (can be PO if tolerating enteral medication)
If co-amoxiclav or cephalosporin not appropriate	Seek microbiology advice

*** May need longer course of antibiotics and discussion with microbiologist/orthopaedics if there is significant tissue destruction/penetrating to the bone, joint, tendon or vascular structures or osteomyelitis/septic arthritis.

2.6 CONSIDER ADMISSION and SEEK SPECIALIST ADVICE:

- Systemic signs of infection
- Refractory to oral antibiotics
- Have developed lymphangitis
- Unable to take oral antibiotics
- Immunocompromised / at risk of a serious wound infection because of pre-existing serious medical condition (e.g., diabetes, asplenia, decompensated liver disease)
- Multiple and severe injuries
- Involvement of joint/bone/nerve/tendon / high risk areas e.g., hands, feet or facial bites; osteomyelitis, septic arthritis
- Wounds requiring surgical intervention
- Human bites with puncture wounds: regarding blood borne viruses and post-exposure prophylaxis / vaccination.

2.7 REASSESSMENT

- Reassess if signs or symptoms of infection develop or worsen rapidly or significantly at any time, or do not start to improve within 24-48 hours of starting treatment.
- The person becomes systemically unwell.
- The person has severe pain that is out of proportion to the infection.
- Patients who are non-verbal or have communication difficulty may show other signs of pain, e.g., change in behaviour.
- IF skin swab has been sent for microbiology, review the results and change antibiotics if needed.

Vaccinations/Post exposure prophylaxis:

- **Beyond the scope of this guideline – Please seek specialist advice**

3. Education and Training

None

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Appropriate antibiotic prescribing	Audit	Consultant		

5. Supporting References

NICE guideline on other bites and stings:
https://www.nice.org.uk/guidance/conditions-and-diseases/infections/bites-and-stings
NHS advice for patients with animal or human bites:
https://www.nhs.uk/conditions/animal-and-human-bites/.

Public Health England advice on tetanus prone wounds: The Green Book (www.gov.uk).
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/859519/Greenbook_chapter_30_Tetanus_January_2020.pdf
Aziz H, Rhee P, Pandit V, et al. The current concepts in management of animal (dog, cat, snake, scorpion) and human bite wounds. *J Trauma Acute Care Surg* 2015;78:641–8.
Fielding P, Messahel S. Guideline review – human and animal bites: antimicrobial prescribing. *Arch Dis Child Educ Pract ED* 2021; 0:1-4.

6. Key Words

Antibiotics, Crush, Degloving Injuries, Lacerations, Puncture, Wounds,

---

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) **P Patel – Consultant**	**Executive Lead** **Chief medical officer**
Details of Changes made during review: **Minor changes;** **Section 2.6 addition of human bites with puncture wounds: regarding blood borne viruses and PEP/vaccination**	

Appendix 1
Tetanus-prone wounds:

- puncture-type injuries acquired in a contaminated environment and likely therefore to contain tetanus spores e.g. gardening injuries
- wounds containing foreign bodies
- compound fractures
- wounds or burns with systemic sepsis
- certain animal bites and scratches - although smaller bites from domestic pets are generally puncture injuries animal saliva should not contain tetanus spores unless the animal has been rooting in soil or lives in an agricultural setting

Note: individual risk assessment is required and this list is not exhaustive e.g. a wound from discarded needle found in a park may a tetanus-prone injury but a needle stick injury in a medical environment is not

High-risk tetanus-prone wounds include: Any of the above with either:

- heavy contamination with material likely to contain tetanus spores e.g. soil, manure
- wounds or burns that show extensive devitalised tissue
- wounds or burns that require surgical intervention that is delayed for more than six hours are high risk even if the contamination was not initially heavy

Table 2: Assessment of Immunisation status

Immunisation status	Immediate Treatment			Later Treatment
	Clean wound	Tetanus Prone	Tetanus prone + High Risk	
Fully Immunised (defined as): Under 5s who have had full primary course♦ Age 5-10 with primary course♦ and 1 booster Over 11 years of age and had ≥ 3 doses♦♦ And 3rd dose within the last 10 years	None	None	None	Further doses of vaccine as per usual recommended schedule
Primary course♦ uptodate but boosters not up to date (includes over 5s with no booster)	None	Vaccine dose "booster"	Vaccine dose "booster" **+** 1 dose TIG in a different site	Further doses of vaccine as per usual recommended schedule
Not had full primary course♦ OR Immunisation status unknown	Vaccine dose	Vaccine dose **+** 1 dose TIG in a different site	Vaccine dose "booster" **+** 1 dose TIG in a different site	Further doses of vaccine as per usual recommended schedule

♦ Primary course: 3 doses of tetanus containing vaccine at least one month apart (usually given at 2,3 and 4 months of age)

♦♦ At least 3 doses of tetanus vaccine at appropriate intervals. This definition of "adequate course" is for the risk assessment of tetanus-prone wounds only. The full UK schedule is five doses of tetanus containing vaccine at appropriate intervals.

Vaccine Booster

If tetanus vaccine "booster" required:

Under 10yrs of age – dTap/IPV (Repevax) or DTaP/IPV (Infarix-IPV)

Over 10yrs of age – Td/IPV (Revaxis)

If not had full primary course or status unknown give:

Under 10yrs of age – DTap/IPV/Hib (Infanrix hexa)

Over 10yrs of age – Td/IPV (Revaxis)

For further information regarding tetanus immunisation please see: The Green Book (www.gov.uk)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1080599/Green_Book_on_immunisation_chapter_30_tetanus.pdf

Appendix 2: Rabies

Please follow the link below for management of suspected Rabies:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1037545/Guidelines_on_rabies_post-exposure_treatment___September_2021.pdf