

Health Protection Team Guidance for the Management of Human Bite Injuries in Wales (2019)

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Purpose and Summary of Document:

The intended audience for this document is healthcare professionals based in Wales who are involved in the clinical management of human bite injuries, and people advising these healthcare professionals, such as Health Protection staff.

This guidance has been reviewed by the HPT Infection Prevention and Control Working Group in April 2019 to ensure that up to date Health Protection Team guidance is available for the management of human bite injuries in Wales.

Superseding Public Health Wales HPT Guidance on the Management of Human Bite Injuries V1 (2016).

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1. Acknowledgment

This document has been updated in accordance with the recent NICE Clinical Knowledge summaries revised in October 2018 and next planned review December 2023¹.

This document is based on guidance initially published by the Health Protection Agency (HPA) in the North West of England in October 2010². Permission to use the original HPA document as a template has been granted.

2. Introduction

This document provides guidance on the management of potential infections arising from significant human bite injuries where teeth have broken the skin. Occupational Health Departments are likely to have their own guidance or policies for biting incidents occurring in the workplace and the enquirer should be advised to consult these in the first instance if the biting incident has occurred in a work setting.

NOTE: Bites that do not break the skin are not classed as significant injuries for the purposes of this guidance and the recommendations in this document do not apply. However, it is still advisable to wash the skin with soap and water.

Human bites where the skin has been broken will usually require clinical assessment. They should be referred for example to the patient's GP practice, a local minor injuries unit or an emergency department.

Human bites can occur in a range of settings including care settings for children, people with mental health illness or learning disabilities; and other settings where challenging behaviour may be expressed such as in prisons or in the work of police officers or during fights. Bites are most commonly reported on fingers and hands. As well as the trauma from a bite, wounds may be contaminated with pathogens even if there are no clinical signs of infection. Depending on the nature and severity of the bite, there is potential for transmission of bacterial pathogens and blood-borne viruses (BBV). Whilst BBV transmission from human bites has been reported in the literature^{1, 2}, the risk is thought to be extremely low³, dependent on the BBV status of the injured person and the biter, and whether blood was present during the biting incident. Following a biting incident in which the skin is broken, the injured person is at risk of bacterial infection and both the injured person and the biter are at risk of BBV infection.

The risk of bacterial infection is greater than that of BBVs. It can be caused by bacteria in the mouth and by inoculation of bacteria colonising the injured person's skin. If a bite wound becomes infected, the longer it remains untreated the greater the risk of severe local and systemic complications⁴.

This guidance document is not intended to provide detailed first aid advice, and referral to local protocols is recommended. Neither does it address wound closure. Bite wounds suitable for management in primary care do not usually require closure. Referral to an Emergency Department (ED) for further assessment and management is usually indicated if wound closure is thought to be necessary.

3. Immediate assessment and care of the bite wound

Only bites that break the skin are classed as significant injuries for the purposes of this guidance and the recommendations made in this document. However, it is still advisable to wash the skin thoroughly with soap and water after any bite.

- In the initial primary care management, a competent and appropriately trained individual (using appropriate PPE and infection prevention and control practices) should assess the severity of the bite.
- If the skin is broken and the injury has just occurred, gently encourage the wound to bleed, unless it is already bleeding.
- If possible, remove any visible foreign bodies from the bite wound e.g. teeth.
- Irrigate the wound thoroughly with clean running water or normal saline
- Consider the need for secondary care intervention by staff at an Emergency Department (ED) or Minor Injuries Unit (MIU). If the wound is sufficiently serious or shows signs of deep penetration it may require surgical washout or wound closure. Types of wounds that may be considered for closure include uncomplicated wounds with no risk factors for infection, for example those presenting early which are not heavily contaminated, have been adequately irrigated and debrided, and do not involve underlying structure.
- The following wound bites should be allowed to heal without formal closure¹:
 - Bite wounds over 24hrs old
 - Infected bite wounds
 - Deep puncture wounds
 - Crush injuries
 - Heavy contamination
 - Uncertain adequacy of debridement
 - Bites to the limbs, hands or feet.
- Cover with an appropriate clean dressing.
- If a part of the body has been bitten off, for example part of an ear or finger, it should be stored in a plastic bag wrapped in clean tissue surrounded with ice, for transport to hospital along with the injured person, where an assessment can be made about its re-attachment.
- Consider the need for debridement, (for example if the wound is dirty or there is non-viable tissue), and refer to ED/MIU if this is required and the skills and resources are not available in primary care.
- Advise analgesia (painkillers) such as paracetamol or ibuprofen, if pain relief is required.
- If the biter has blood in their mouth, they should rinse it thoroughly with tap water and spit out.
- Collect as much relevant information as possible about the injured person, the biter, and the date, time and nature of the injury. Assess the severity of the injury, whether the skin has been broken and if blood is involved. See [appendix 1](#) for an example of a form that can be used for collecting this information.

4. Bacterial infection/Antibiotic prophylactic treatment.

The risk of bacterial infection is greater than the risk of BBV infection following a human bite which has broken the skin. More than 42 different species of bacteria have been isolated in the human mouth and up to 190 when gingivitis or periodontitis are present. The most common organisms in human bites include *Streptococcus* spp, *Staphylococcus aureus*, *Haemophilus* spp, *Eikenella corrodens*, *Bacteroides* spp and other anaerobes. *E. corrodens* has been found in 25% of human bites to the hand¹. There is some limited evidence that antibiotics prevent infection after a human bite⁵, although the benefit may only apply:

- with deeper wounds and those involving underlying structures⁶
- where there has been a delay of more than 8 hours in seeking clinical attention
- where the bite involves the hand or face or
- where the person bitten is immunocompromised or asplenic⁷.

If a bite is 72 hours old or more and there is no sign of infection, the risk of infection is likely to be low and prophylactic antibiotics are probably not of value¹. If the wound appears infected, send pus or a wound swab for culture before cleaning the wound, and ideally before starting any antibiotics. State on the form that the swab is from an infected human bite. Consider referral to hospital for possible admission for anyone who has signs or symptoms of a systemic infection such as progressive cellulitis tracking from the site, indications of acute deterioration (See 1000 Lives Rapid Response to Acute Illness Learning Set (RRAILS) www.1000livesplus.wales.nhs.uk/rrails). In such cases intravenous antibiotics may be required¹. For both prophylaxis and treatment of an infected human bite, the following is currently recommended by the All Wales Medicines Strategy Group⁸:

For up-to-date advice on appropriate use of antimicrobials please refer to

- the online version <https://www.nice.org.uk/Media/Default/About/what-we-do/NICE-guidance/antimicrobial%20guidance/summary-antimicrobial-prescribing-guidance.pdf?UNLID=7507873742019290214> produced by Public Health England and NICE
- the All Wales Medicines Strategy Group (2015) Primary Care Antimicrobial Guidelines www.awmsg.org/awmsgonline/docs/awmsg/medman/Primary%20Care%20Antimicrobial%20Guidelines.pdf
- Alternatively refer to your organisation's local antibiotic prescribing policy

For further information on contraindications, cautions, drug interactions, and adverse effects, see the [electronic Medicines Compendium](#) (eMC), or the [British National Formulary](#) (BNF).

5. Blood-borne virus (BBV) infection

As well as being blood-borne, Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human immunodeficiency virus (HIV) can also be found in saliva of infected people in low concentrations². Whilst there is a theoretical risk of BBV transmission through human bites, the risk is generally thought to be **very low** and reports of BBV transmission through human bites are rare³. It is important to note that the risk increases if blood is present during the biting incident. This could be blood from the biter or the injured person. In many biting incidents it isn't possible to identify the biter or approach them to offer/request testing, however where the biter can be identified, and where circumstances allow, they should undergo the same risk assessment as the person they have bitten and their blood should also be tested if they consent. Before testing for BBVs following a biting incident, consider appropriate pre-test counselling and consult local policy on this where available. Whilst there is effective post-exposure prophylaxis (PEP) for HBV and HIV, there is no PEP effective against HCV. Although testing can be undertaken for all three BBVs (see below), assessment and pre-test counselling should determine whether testing for all three is necessary based on the risk posed by the incident. **Bites that do not break the skin do not pose a risk of BBV transmission and there is no need for PEP or testing for BBVs.**

5.1 Risk assessment

The risk assessment may be made in a variety of settings including general practice, occupational health departments, emergency departments and minor injury departments.

Where possible, the risk assessment should apply to both the injured person and the biter

- Record the date and time of the incident
- Is the BBV status of the biter and the injured person known? If BBV positive then specify which BBV and the current status of their infection if known (e.g. HIV Ag/Ab positive, HBsAg positive and HBV markers, HCV antibody positive, HIV/HCV/HBV viral load)
- Consider all people involved to be at risk of being a source of BBV infection or of acquiring a BBV unless their current status is known, however a risk assessment is required
- The following are considered to be high risk for HCV infection: Known positive HCV RNA or antibody positive with unknown RNA; history of injecting drug use (IDU); blood transfusion outside UK, US, Canada, Australia, New Zealand, and Western Europe; tattoos from unlicensed premises (including prisons); born or resident in a country of high HCV prevalence
- The following are considered to be low risk for HCV infection: unknown source patient or no history available
- If either is known to be HIV positive, seek advice from a HIV specialist immediately
- Is their Hepatitis B vaccination status and surface antibody response known?
- Is the identity of the biter known and can the injured person and the biter be approached for testing?
- Can they give informed consent to testing of their blood?
- Refer to local policy on gaining consent, or seek advice in situations where a person lacks capacity to give informed consent

5.2 Blood tests

The risk of acquiring a BBV infection during a biting incident is arguably greater for the biter than for the injured person given that the biter will be exposed to the injured person's blood and the injured person is exposed only to the biter's saliva (unless the biter also has blood in their mouth). Whilst the risk of acquiring a BBV infection in a biting incident is low it is not zero, therefore the default position should be to offer testing for all three BBVs (see [Box 1](#)). However, venepuncture can be traumatic and may cause considerable anxiety for young children, therefore when a biting incident occurs for example, in a children's nursery, a robust risk assessment should dictate the necessity for blood testing as it may be possible to avoid testing the child. In these circumstances, a discussion of the risks with an expert such as a consultant virologist or microbiologist is useful.

If either the biter or the bitten person cannot be identified, then blood should be taken from the known person for storage only; there is no need to test for current or past BBV infection at the time of the incident (knowing one person's BBV status at the time of the incident is only useful for managing the other person). [Box 1](#) lists the tests to consider for both the injured person and the biter. Sequential testing over a six month

period is necessary in order for potential seroconversion to be identified at any point during the incubation periods. Only after the final test can the patient be reassured that they have not acquired a BBV infection from the incident.

Box 1

Box 1. Blood tests to consider for both parties			
Time	Hepatitis B	Hepatitis C	HIV [§]
At time of incident (if both people are known/identifiable)	HBsAg	Ab	Ag/Ab combined test
At time of incident (if only one person is known/identifiable)	10ml clotted blood for storage		
6 weeks after bite incident (only needed if high risk for HCV, otherwise no testing needed at 6 weeks)	HBsAg	PCR	Ag/Ab combined test
3 months after bite incident	HBsAg	Ab (add PCR only if either person is high risk for HCV)	Ag/Ab combined test
6 months after bite incident	HBsAg	Ab	Only needed if person did not attend for testing at 3 months: Ag/Ab combined test

[§]Please see point 1 in the post-exposure prophylaxis (PEP) section below regarding timing of the follow-up HIV test if PEP is given

Key:

HBsAg= Hepatitis B surface antigen

HCV = Hepatitis C Virus

HIV = Human Immunodeficiency Virus

PCR= Polymerase chain reaction

Ag= Antigen

Ab= Antibody

PEP = Post Exposure Prophylaxis

If any of the tests are positive, ensure that the person is referred to a relevant specialist and provide appropriate public health/infection prevention advice. The Health Protection Team should follow-up newly diagnosed cases of hepatitis B and hepatitis C in the normal manner.

5.3 Post-exposure prophylaxis (PEP)

1. The risk of HIV from a human bite is very low and in most circumstances HIV PEP is not required (See BHIVA and BASHH guidance⁹). In circumstances where either person is known to be HIV positive and the bite draws blood, causes very deep wounds or the viral load is high then PEP could be considered after discussion with a specialist. In most circumstances where HIV PEP is being considered the bitten individual will be managed at an emergency department, under the direction of a microbiologist or virologist. If HIV PEP is given, the follow-up blood test should be done 8-12 weeks after the incident.
2. There is no PEP available for HCV.
3. [Box 2](#) lists the situations in which Public Health England¹⁰ recommend Hepatitis B vaccine and/or Hepatitis B immunoglobulin (HBIG) following **significant** exposure incidents.

Box 2

Box 2. Hepatitis B PEP			
HBV status of person exposed	HBsAg positive source	Unknown source	HBsAg negative source
Unvaccinated	Accelerated course of Hepatitis B (HB) vaccine* plus HBIG with first dose	Accelerated course of HB vaccine*	Consider course of HB vaccine
Partially vaccinated	One dose of HB vaccine and finish course	One dose of HB vaccine and finish course	Complete course of HB vaccine
Fully vaccinated with primary course	Booster dose of HB vaccine if last dose \geq 1 year ago	Consider booster dose of HB vaccine if last dose \geq 1 year ago	No HBV prophylaxis. Reassure
Known non-responder to HB vaccine (Anti-HBs <10IU/ml 1-2 months post vaccination)	HBIG. Booster dose of HB vaccine. 2 nd dose of HBIG after a month	HBIG. Consider booster dose of HB vaccine. 2 nd dose of HBIG after a month	No HBIG. Consider booster dose of HB vaccine

*An accelerated course of vaccine consists of doses spaced at 0, 1 and 2 months.

6. Tetanus infection

The risk of tetanus from a human bite is **very low** and in most circumstances tetanus immunoglobulin (TIG) **is not** required. Tetanus vaccine is not considered adequate for treating a tetanus-prone wound since tetanus vaccine given at the time of a tetanus-prone injury may not boost immunity early enough to give additional protection within the incubation period of tetanus. However, if they are not already fully vaccinated, a dose of vaccine given opportunistically at the time of injury will help ensure that the individual is protected against future exposure.

Tetanus infection is caused by the toxin of the tetanus bacillus, *Clostridium tetani* (*C.tetani*). Tetanus spores are present in soil or manure, but can also be found on human skin and in the human gastrointestinal tract. The bite itself does not usually introduce *C.tetani* into the wound but the break in the skin can allow *C.tetani* to enter the body¹¹.

A total of five doses of tetanus vaccine, administered at the appropriate intervals, is considered to give lifelong immunity¹².

Public Health England states¹² that

"Tetanus-prone wounds include:

- 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 [be] 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”

If the injury fulfils any of the above criteria AND is considered to be high risk (i.e. heavy contamination with material likely to contain tetanus spores and/or extensive devitalised tissue), TIG may be required. Most human bites do not fulfil the above criteria and TIG is not usually indicated. In the event that the injury appears to meet the above criteria, refer to the Green Book chapter 30 page 11 to assess the need for TIG¹².

7. Follow-up

Refer to local policy for the follow-up of people involved in biting incidents.

In the absence of local policy, the following principles are useful and should be applied¹:

- If the person was seen in hospital, hospital staff are responsible for organising follow-up by an appropriate service
- If the bite wound is not infected advise the person to check for signs of infection and if these develop to attend urgently for review
- If the wound is infected review at 24 and 48 hours to ensure the infection is responding to treatment. Advise the person to attend urgently for review if the infection worsens or if they feel increasingly unwell

Where testing for BBVs has been undertaken, follow-up appointments in an appropriate service (occupational health, general practice, etc.) for sequential blood tests should be arranged by the person initiating testing, as detailed in [Box 1](#) above

NOTE: If a bite has been inflicted on a child, consider child protection issues and follow local policies for referral of children considered at risk¹. A POVA (Protection of Vulnerable Adults) referral may need to be considered if a bite is inflicted on a vulnerable adult, in which case the local POVA policy should be followed.

ASSESS: Can actions be taken to prevent similar biting incidents from occurring in future?

8. References

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9. Appendix 1

Is this a significant bite (broken skin) YES NO (if "No" then no need to continue)									
Details of the incident (include the following where possible: date, time, place, witnesses, skin broken, whose blood involved, is wound infected)									
Details of injured person									
Name									
Address									
Tel No									
DOB									
GP									
Known to have or to be at risk of a BBV? Please mark as "positive", "high risk", or "unknown".				HBV	HCV	HIV	Comments:		
Vaccinated against Hepatitis B? If so, give dates in relevant box.				Not vaccinated	1 st dose	2 nd dose	3 rd dose	4 th dose	5 th dose
Hepatitis B surface antibody test result with date or state if not done:									
Summary of actions taken for injured person:									
Details of biter (or mark as "unknown")									
Name									
Address									
Tel No									
DOB									
GP									
Known to have or to be at risk of a BBV? Please mark as "positive", "high risk", or "unknown".				HBV	HCV	HIV	Comments:		
Vaccinated against Hepatitis B? If so, give dates in relevant box.				Not vaccinated	1 st dose	2 nd dose	3 rd dose	4 th dose	5 th dose
Hepatitis B surface antibody test result with date or state if not done:									
Summary of actions taken for biter:									
Post-exposure prophylaxis (PEP)									
Injured person		Biter		Date / Comments					
Antibiotics									
HB vaccine									
HBIG									
HIV PEP									
Tetanus vaccine									
Tetanus immunoglobulin (TIG)									
Blood tests									
Injured person		Biter		Date / Comments					
At time of incident									
6 weeks									
3 months									
6 months									