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BITES AND SCRATCHES - PEDIATRICS

DEFINITION

An injury or mark caused by an animal or a human being. The primary puncture wounds are caused by teeth that may also tear tissue and, in some cases, remove tissue in pieces. Wounds frequently become infected.

Nurses with Remote Practice Certified Practice designation (RN(C)s[1]) are able to treat bites in children who are **1 year of age and older,** dependent on the bite severity. If younger than one year or the severity of the bite dictates, the child must be referred to a physician or nurse practitioner.

If a bite has been inflicted on a child, consider child protection issues and follow local policies for referral of children considered at risk.

Potential Causes

- Animal bites are common. 60–80% are caused by dogs, and 20–30% by cats; bites by other animals (rabbits, guinea pigs, hamsters, rats, mice) are much rarer. The victims tend to be children.
- Human bites account for as many as 20% of all bite injuries in some urban areas. Indirect human "bite" wounds caused by a blow from the fist to another person's teeth have their own specific pattern of injury (known as reverse bite injury, clenched fist injury, or fight bite).
- The spectrum of injury is broad, and infectious complications, generally due to unusual pathogens, are common.

Typical Findings of a Bite Wound

History

- Cause of injury (human, animal)
- Animal bite: determine if bite was caused by a provoked or unprovoked animal
- Determine vaccination status of the animal (if possible). Refer to BCCDC, Communicable Disease Control, Management of Specific Diseases, Rabies (May 2017).
- Human bite: assess to determine exposure risk to the bloodborne viruses' hepatitis B virus (HBV), hepatitis C virus (HCV), syphilis, and Human Immunodeficiency Virus (HIV).

[1] RN(C) is an authorized title recommended by BCCNP that refers to BCCNP-certified RNs, and is used throughout this Decision Support Tool (DST).

bloodborne viruses'. Refer to BCCDC, Communicable Disease Control, Blood and Body Fluid Exposure (August 2016).

- Time elapsed since injury (after 3 hours, the bacterial count in a wound increase dramatically)
- Contaminants:
    - wound contact with manure, rust, dirt, etc., will increase risk of infection and tetanus wounds sustained in barnyards or stables should be considered contaminated

  (*Clostridium tetani* is indigenous in manure)
- Amount of blood lost
- Loss of function in nearby tendons, ligaments, nerves (sensation)
- Immunization status:
    - Tetanus
    - Hepatitis

  Known methicillin resistant staphylococcus aureus (MRSA) positive status of client or household contacts

PHYSICAL ASSESSMENT

Pediatric drug doses are calculated by patient weight. Pediatric doses should not exceed recommended adult doses.

Vital Signs

- Temperature
- Pulse
- Respiration
- SpO_2
- Blood pressure (BP)
- Findings may be tachycardia, hypotension if significant blood loss

General
Assess wound for:

- Dimensions and depth
- Lacerations versus punctures
- Tissue loss
- Infection – erythema, warmth, tenderness, discharge, local lymphadenopathy
- Foreign bodies – inspect the area

Assess integrity of underlying structures (nerves, ligaments, tendons, blood vessels):

- Vascular injury – capillary refill should be checked distally
- Neurologic injury – check distal muscle strength, movement distal to wound and sensation
- Always check sensation before administering anaesthesia
- For hand and finger lacerations check two-point discrimination, (Two-point discrimination measures the individual's ability to perceive two points of stimuli presented simultaneously. The health care practitioner is interested in the smallest distance between the points that can still be perceived as two points by the individual being tested.), (this should be less than 1 cm at the fingertips
- Tendons – can be evaluated by inspection, but individual muscles and tendons must also be tested for full range of motion and full strength
- Assess range of motion of all body parts surrounding the wound site
- Bones – check for open fracture or associated fractures, based on mechanism of injury

Diagnostic Tests

- Swab discharge for Culture and Sensitivity (C&S) if infected
- For animal bite injuries follow the British Columbia Centre for Disease Control (BCCDC) Rabies Protocol (see references)
- For human bite injuries follow the British Columbia Centre for Disease Control (BCCDC) Blood and Body Fluid Exposure Management.

Management and Intervention

Note: Remove all jewellery from affected area

- **Prophylaxis for tetanus, rabies and blood borne pathogens should be provided when indicated, as per the BCCDC.**
- As per the BCCDC, the risk of HIV from a human bite is very low and in most circumstances HIV PEP is not required. In extreme circumstances, if either person is known to be HIV positive and the bite draws blood, causes very deep wounds, or the viral load is high then post exposure prophylaxis (PEP) could be considered after discussion with a specialist. If HIV PEP is given, the follow-up blood test should be done. There is no PEP available for HCV.

- **Note: People who have experienced the following** should not get tetanus immune, those who have:
    - had a life-threatening reaction to a previous dose of any immune globulin or any of its components;
    - a condition called isolated immunoglobulin A deficiency;
    - a history of thrombosis or risk factors for thrombosis; or
    - been immunized against measles, mumps, rubella or chickenpox within the past 14 days.

Goals of Treatment

- Prevent/control infection
- Preserve function
- Prevent infection from Blood Borne Pathogens, tetanus, or transmission of rabies

Non-pharmacological Interventions

- Thoroughly cleanse and irrigate with normal saline
- Remove any debris and devitalized tissue
- Consider suture repair of low-risk bite wound lacerations. These are non-infected wounds, have no evidence of damage to underlying structures and present within 8-12 hours of injury.
- Do not suture or close:
    - Infected wounds
    - Deep puncture wounds
    - Bite wounds more than 8-12 hours old
    - Crush injuries
    - Bites in an immunocompromised host
    - Cat or human bites
    - Bites to the hand or foot

PHARMACOLOGICAL INTERVENTIONS FOR BITES

Ensure recent weight obtained (for drugs doses dependant on weight)

- Prophylaxis for blood borne pathogens should be provided when indicated. as per BCCDC's Blood and Body Fluid Exposure Management. Guideline.
- Antibiotics are routinely given prophylactically for cat bites as they have a greater prevalence of anaerobes and infection (65% vs. 50%) and P. multocida (75% vs. 50%) than do dog bites.,[2] Antibiotics are routinely given prophylactically for all human bites if there is moderate to severe tissue damage, deep puncture wounds or bites to the face, hand, foot or genitals that are more than a simple superficial abrasion.
- If infection has already occurred (especially for a bite on the hand) consult with physician or nurse practitioner to consider intravenous (IV) antibiotics
- Exposure to the face and hands increases the risk of rabies because these body parts are highly innervated, providing greater and faster opportunity for virus to enter the nervous system.[4]

Antibiotic prophylaxis is required when:

- The wound has been closed or there is evidence of infection
- It is moderate to severe
- Puncture wounds, particularly if penetrating bone, tendon or joint
- Crush injury / edema
- Preemptive early antimicrobial therapy for 3–5 days is recommended for patients who (a) are immunocompromised; (b) are asplenic; (c) have advanced liver disease; (d) have preexisting or resultant edema of the affected area; (e) have moderate to severe injuries, especially to the hand or face; or (f) have injuries that may have penetrated the periosteum or joint capsule.

Note: People who have experienced the following should not get tetanus immune, those who have: had a life-threatening reaction to a previous dose of any immune globulin or any of its components;

- a condition called isolated immunoglobulin A deficiency;
- a history of thrombosis or risk factors for thrombosis; or
- been immunized against measles, mumps, rubella or chickenpox within the past 14 days.4

PHARMACOLOGIC INTERVENTION BITES

Assess for risks of blood borne pathogen and/or rabies transmission and treat appropriately.

Prophylaxis:

Amoxicillin/clavulanate 40 mg/kg/day po divided tid for 3-5 days (dosing is based on amoxicillin component).

Pregnant and Breastfeeding Youth:

Amoxicillin/clavulanate may be used as listed above
DO NOT USE doxycycline

Treatment for infected bites or scratches:

Amoxicillin/clavulanate 40 mg/kg/day po tid 10 days (dosing is based on amoxicillin component).

Pregnant and Breastfeeding Youth

Amoxicillin/clavulanate may be used as listed above
DO NOT USE doxycycline

Potential Complications (All Bites)

- Septic arthritis
- Osteomyelitis

- Abscess formation
- Tendonitis
- Nerve damage
- Compartment syndrome
- Fracture
- Sepsis
- HIV and Hepatitis B and C as a result of exposure to body fluids – (human bites only)
- Tetanus and or Rabies

Client/Caregiver Education and Discharge Information

- Advise on condition, timeline of treatment and expected course of disease process
- Instruct to keep wound clean and dry
- Keep injured area elevated
- If redness, swelling or pain increases, return to clinic for assessment
- If appropriate, review measures to prevent animal bites:

Monitoring and Follow Up

Return to clinic in 24 hours for re-assessment

Consultation and/or Referral

Refer all human bite wounds over the knuckle or having the potential to injure underlying structures to a physician or nurse practitioner
Refer if infection has already occurred with a human bite
A common location for the human bite is over the knuckles

- This injury is usually sustained when a closed fist strikes the teeth of an opponent
- There is frequently penetration of the tendon sheath and/or the joint space
- The hand must be examined with the fingers in a flexed position so that the deeper structures are in the identical position that they were when the injury was sustained
- Only in that position can injury to the underlying structures be visualized through the open skin wound. Sometimes, a foreign body such as a broken tooth is found in the wound

Refer all facial bites to a physician or nurse practitioner
Refer any concerns regarding rabies or unprovoked attacks to public health or a medical health officer
Encourage client / parent or caregiver to report a dog attack / bite to RCMP, animal control officer or appropriate official

Documentation

- As per agency policy
- Additional public health reporting may be required in relation to rabies prophylaxis

REFERENCES

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