



Complete Summary

GUIDELINE TITLE

Management of human bite wounds.

BIBLIOGRAPHIC SOURCE(S)

University of Texas, School of Nursing, Family Nurse Practitioner Program.
Management of human bite wounds. Austin (TX): University of Texas, School of Nursing; 2007 May. 22 p. [41 references]

GUIDELINE STATUS

This is the current release of the guideline.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse (NGC): This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- [July 08, 2008, Fluoroquinolones \(ciprofloxacin, norfloxacin, ofloxacin, levofloxacin, moxifloxacin, gemifloxacin\)](#): A BOXED WARNING and Medication Guide are to be added to the prescribing information to strengthen existing warnings about the increased risk of developing tendinitis and tendon rupture in patients taking fluoroquinolones for systemic use.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Human bite wounds

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

CLINICAL SPECIALTY

Dermatology
Family Practice
Infectious Diseases
Internal Medicine
Pediatrics
Surgery

INTENDED USERS

Advanced Practice Nurses
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To provide recommendations for the management of human bites in an outpatient setting, in otherwise healthy hosts and compromised hosts of all age groups

TARGET POPULATION

Patients of all ages with skin and soft-tissue infection

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnostic Assessment

1. Subjective assessment including history and symptoms
 - Circumstances of the injury
 - Past medical history
 - Drug allergies
 - Tetanus immunization status
 - Routine or recent medications

- History of underlying medical conditions such as diabetes, previous splenectomy, liver disease, presence of prosthetic valves or joints, immunosuppressive disorders, previous mastectomy
2. Objective assessment/physical examination:
 - Temperature, heart rate, dimensions of wound, including depth
 - Assessment for signs of infection
 - Assessment for vascular injury
 - Assess for neurological injury
 - Assessment of tendons
 - Assessment of range of motion, neurovascular status and tendon
 - Photographic documentation
 3. Laboratory tests
 - Blood culture and drug susceptibility tests
 - Complete blood cell count and differential
 - Wound culture for both aerobic and anaerobic bacteria
 4. Radiographic (For wounds near a joint or bone---to evaluate for foreign bodies e.g. tooth fragments)
 5. Surgical consultation for inspection, exploration and/or wound drainage

Treatment/Management

Non-pharmacologic Interventions

1. Direct pressure to control bleeding
2. If a fracture is involved, immobilization of the involved site
3. Skin preparation:
 - Debridement
 - Skin disinfection
 - Wound repair
 - Open wound care
 - Wound closure
 - Suturing
4. Pharmacologic treatment
 - Antimicrobial selection and administration
 - Analgesia
 - Topical antibiotic ointment
 - Tetanus prophylaxis
 - Hepatitis B prophylaxis
 - HIV prophylaxis
5. Referral for surgery
6. Monitoring and follow-up

MAJOR OUTCOMES CONSIDERED

- Function
- Risk of infection
- Repair of injured tissue with minimum of cosmetic deformity
- Healing time
- Treatment time
- Response time

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Online searches were performed for dates January 2000 to January 2007 of the following databases: CINAHL, Cochrane, Pubmed, Medline, and UpToDate (major key words: human bites, human bite wounds, human bite wounds diagnostic tests, human bite wounds management, and human bite wound medication). Position statements from the Infectious Disease Society of America-Medical Specialty Society, American Academy of Pediatrics, and Center for Disease Control and Prevention- Federal Government were also reviewed. Additional resources were identified by review of bibliographies of relevant articles and published guidelines.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Subjective Review
Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Quality of Evidence (Based on the U.S. Preventive Services Task Force Ratings)

- **Good:** Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes.
- **Fair:** Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies, generalizability to routine practice, or indirect nature of the evidence on health outcomes.
- **Poor:** Evidence is insufficient to assess the effects on health outcomes because of limited number or power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes.

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Journal articles were analyzed for quality based on type of study design, method, number of subjects, representative sample, generalizability of results, and applicability for target populations.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Strength of Recommendations (Based on the U.S. Preventive Services Task Force Ratings)

A. There is good evidence that the recommendation improves important health outcomes. Benefits substantially outweigh harms.

B. There is at least fair evidence that the recommendation improves important health outcomes. Benefits outweigh harms.

C. There is at least fair evidence that the recommendations can improve health outcomes but the balance of benefits and harms is too close to justify a general recommendation.

D There is at least fair evidence that the recommendation is ineffective or that harms outweigh benefits.

I. Evidence that the recommendation is effective is lacking, of poor quality, or conflicting, and the balance of benefits and harms can not be determined.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline was developed by a group of family nurse practitioner (FNP) students and submitted for review to the FNP program faculty and expert

reviewers. Before submitting to the guideline committee, revisions were made based on reviewer recommendations.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Strength of recommendations (A, B, C, D, I) and quality of evidence (good, fair, poor) are defined at the end of "Major Recommendations" field.

Subjective Assessment/History and Symptom Analysis

- Circumstances of the injury
- Time of injury (after three hours, the bacterial count in a wound increases dramatically)
- Past medical history
- Allergies (to drugs, dressings, local anesthetics)
- Tetanus immunization status
- Routine or recent medications (especially steroids, anticoagulants)
- History of underlying medical conditions such as diabetes, previous splenectomy, liver disease, presence of prosthetic valves or joints, immunosuppressive disorders, previous mastectomy (to help screen for any diseases that may delay wound-healing and increase the risk of infection)

(Taplitz, 2004; Revis & Seagle, 2006; First Nations & Inuit Health, 2005)

Objective Assessment/Physical Examination

- Vital signs: Temperature, blood-pressure and heart rate.
- Dimensions of wound, including depth (the decision to administer oral or parenteral antibiotics depends on the depth and severity of the wound).
- Assess for signs of infection: redness, heat, tenderness, discharge, fever, local lymphadenopathy.
- Document any drainage from the wounds or tissue loss.
- Assess for vascular injury: capillary refill should be checked distal to the wound.
- Assess for neurological injury: Check muscle strength, movement and sensation distal to the wound.
- Assess tendons: assess individual muscle strength, and range of motion of sites with the wound.
- Photographic documentation

(McNamara & Plantz, 2005; Taplitz, 2004; First Nations & Inuit Health, 2005; Revis & Seagle, 2006)

Diagnostic Procedures

- Labs: blood culture and sensitivities, complete blood cell count with differential, human immunodeficiency virus (HIV), hepatitis C virus (HCV), and hepatitis B virus (HBV) serologic status.

- Cultures for both aerobic and anaerobic bacteria are recommended if the wound shows clinical evidence of infection.
- Radiographic: for wounds near a joint or bone ---to evaluate for foreign bodies (e.g., tooth fragments).

(Baddour, 2006; "Bloodborne pathogens," 2007; Bower, 2003; Clark, 2003; Godoy, Bonadeo, & Peralta, 2003; Havens, 2003; Macbean, Taylor, & Ashby, 2007; Revis, 2006; Talan et al., 2003; Wallace & Robertson, 2005)

Step 1- Patient and Family Education

1. Explain diagnosis. Human bites cause more serious infections than dog and cat bites because the human oral flora contains multiple species of bacteria. Bites are categorized as either occlusal/simple injuries or clenched-fist injuries. The occlusal/simple injury is inflicted by actual biting. Clenched-fist injuries occur when the closed fist hits a person's teeth, often during a fight. **Evidence Good, Recommendation A**
2. Explain risks associated with bite wounds. Current data suggest an infection rate from human-bite wounds on the order of 10% to 50%, depending on the wound type and location. Occlusal/simple bite wounds to areas other than the hand probably are no more at risk for infection than any other type of bite wound and minimally more than for nonbite lacerations. However, human-bite wounds to the hand are associated with infection rates of almost 50%. Infection varies from cellulitis to osteomyelitis or septic arthritis. A clenched-fist injury is considered the most serious of all human-bite wounds. Five percent of human bite wound cases may require amputation because of vascular compromise or infectious complications. **Evidence Good, Recommendation A**
3. Establish treatment goals. To offer immediate first aid; recognize and treat serious injury (e.g., nerve or tendon laceration); avoid infection (both local and systemic); treat any established infection; achieve satisfactory wound healing with good cosmetic outcome; prevent tetanus; refer appropriately anyone at risk of contracting hepatitis or HIV for specialist advice. **Evidence Fair, Recommendation B**

(Bower, 2001; Clark, 2003; Leit & Tomaino, 2005; Sweet, 2007; Waibel & Misra, 2003)

Step 2- Non-pharmacological Treatment

1. History and Physical. Circumstances surrounding the injury; precipitating event or activity; exact mechanism of injury; time of occurrence; location of occurrence; whether the other party involved is known to the patient and available should testing be indicated; treatment initiated prior to presentation. **Evidence Good, Recommendation A**
2. Homeostasis. Direct pressure is the first choice for controlling bleeding. If a fracture is involved, immobilization will help control bleeding. **Evidence Good, Recommendation A**
3. Skin Preparation.
 - a. Debridement: Using aseptic technique, remove devitalized tissue; avoid taking healthy tissue. High-pressure irrigation is the most

- effective means of cleansing a wound. Use normal saline in a 60-mL syringe with a 19-gauge needle
- b. **Skin disinfection:** Scrubbing does not cleanse the wound well. Using disinfectants in the wound damages healthy cells needed for healing. Povidone-iodine solution can be used, but avoid getting it into the wound.
 - c. **Wound repair:** Most wounds may be closed with sutures up to 12 hours after the injury. Wounds that are infected or inflamed, dirty, human or animal bites, puncture wounds and severe crush wounds should not be sutured. Wounds that involve the face that are up to 24 hours old may be closed after thorough cleaning. Vascular structures should not be clamped until one determines how significant it is.
 - d. **Open Wound Care:** To keep the wound open, pack with wet saline gauze to help keep the tissue moist and help debride. Avoid iodine dressings because they damage healthy tissue and slow granulation. Once clean granulation tissue is present, the dressing can be changed to dry, sterile, packing material.
 - e. **Wound Closure: Steri-Strips:** for small shallow wounds where the edges fall together naturally along the lines of tension.
 - f. **Suturing:** Larger wounds need suturing. **Evidence Fair, Recommendation B**

(Broder et al., 2004; Chen et al., 2000; Karouris et al., 2004; Morgan, 2005; Smith, Meadowcroft, & May, 2000; Stierman et al., 2003).

Step 3 – Pharmacological Treatment

1. **Antibiotics:** Antibiotics should be given prophylactically for all human bites. Appropriate prophylactic antimicrobial choices include amoxicillin/clavulanate (Clavulin) (B class drug), 20 to 40 mg/kg daily, divided three times a day (TID), orally (PO) for 7 days.
 - a. Alternate regimens for patients with penicillin allergy include clindamycin plus either ciprofloxacin or trimethoprim/sulfamethoxazole or doxycycline. Prophylaxis for 5 to 7 days is preferred, with longer periods required for infected wounds. Consider intravenous (IV) antibiotics if infection has already occurred, especially for a bite on the hand. **Evidence Fair, Recommendation B**
2. **Analgesia:** Ibuprofen or acetaminophen or acetaminophen with codeine. **Evidence Fair, Recommendation B**
3. **Topical Antibiotics:** Consider topical antibiotic ointment for wounds on face and torso: bacitracin ointment (Baciguent) (A class drug), four times a day (QID) for 5 days. Antibiotic ointment should not be left on wounds of the distal extremities for more than 24 to 48 hours, because it may lead to maceration and could delay wound-healing. **Evidence Fair, Recommendation B**
4. **Tetanus Prophylaxis:** Tetanus immune globulin and the three dose vaccine series is indicated for those with unknown history of tetanus vaccine or less than three doses; for those with a history of a complete tetanus series, who had a booster more than five years ago. A tetanus booster is not required for those with a history of 3 or more doses of tetanus and diphtheria (Td) vaccine

and whose last booster was less than 5 years ago. **Evidence Good, Recommendation A**

5. Hepatitis B Prophylaxis: Administration of hepatitis B immune globulin and initiation of hepatitis B vaccine series if patient exposed to hepatitis B.

Evidence Fair, Recommendation B

6. HIV Prophylaxis: Zidovudine 300 mg twice daily + Lamivudine 150 mg twice daily plus Tenofovir 300 mg once daily. This medication regime should continue for four weeks past exposure. **Evidence Fair, Recommendation B**

("Medical management of exposures," 2007; Holten & Onusko, 2000; Medeiros & Saconato, 2001; Merchant et al., 2003; Morgan, 2005; Smith, Meadowcroft, & May, 2000; Stockheim, Wilkinson, & Ramos-Bonoan, 2005; Taplitz, 2004).

Step 4- Surgery/Referral

1. Surgical Care: Surgical intervention is frequently necessary, ranging from simple wound exploration and debridement to repair of complex structures under magnification. Certain patients (e.g., children, persons who are emotionally unstable, persons who are mentally handicapped) may require surgical exploration under anesthesia to adequately examine the wound.

Indications for surgical intervention include:

- Severe soft tissue infection
- Abscess
- Joint penetration
- Underlying fracture
- Tendon laceration
- Osteomyelitis
- Tenosynovitis
- Septic arthritis
- Neurovascular compromise or injury to a complex structure
- Foreign body

Primary closure is recommended for:

- Simple bite wounds of the trunk and extremities (excluding hands and feet) less than six hours old
- Simple bite wounds of the head and neck less than 12 hours old.

Repair the wound using a standard percutaneous closure technique with non-absorbable suture such as monofilament nylon or polypropylene. Avoid multiple layer closures if possible and subcutaneous sutures unless absolutely necessary. Surgical exploration with debridement and lavage for deep or infected puncture wounds from bites. **Evidence Fair, Recommendation B**

(Baddour, 2006; Bower, 2001, 2003; Chen et al., 2000; Clark, 2003; Godoy, Bonadeo, & Peralta, 2003; Griego et al., 1995; Stevens et al., 2005; Tonta & Kimble, 2001).

2. Referral to a specialist: Specialty referral depends on the expertise of the clinician. Consider referral under the following circumstances:
- Refer to a hand surgeon any hand injury with suspicion of tendon injury, fracture, joint space violation, retained foreign body, injury to nerve or vessel, or significant tissue loss. These have a significant risk for permanent disability and should be referred to a hand specialist.
 - Refer to a plastic surgeon any head or neck wound with suspicion of violation of cartilage, retained foreign body, or injury to nerves, vessels, or other complex structure. Also refer to a plastic surgeon any wounds that have caused significant tissue loss creating difficult closure. **Evidence Good, Recommendation A**

(Baddour, 2006; Bower, 2001, 2003; Chen et al., 2000; Clark, 2003; Godoy, Bonadeo, & Peralta, 2003; Griego et al., 1995; Stevens et al., 2005; Tonta & Kimble, 2001).

Step 5- Follow Up

Follow up depends on individual signs and symptoms and treatment regimes. A fully informed patient may make appropriate choices regarding viral prophylaxis when risks and benefits are clearly explained and understood.

Hepatitis B

- Offer the patient a single dose of hepatitis B immunoglobulin (HBIG) and an accelerated course of hepatitis B vaccine with doses at 0, 1, and 2 months, unless the patient is known to be immune.
- If the assailant's hepatitis B status is unknown but is considered high risk and the assailant is unavailable for testing, offer an accelerated course of the hepatitis B vaccine to the patient.
- If the assailant's status is unknown but is considered low risk and the assailant is unavailable for testing, the accelerated course of the hepatitis B vaccine may be offered to the patient with the understanding that the likelihood of disease transmission is low.

Human Immunodeficiency Virus

- If the assailant is known to carry HIV or is considered high risk but unavailable for testing, the Centers for Disease Control and Prevention (CDC) recommends that patients exposed to potentially infectious fluids be offered zidovudine and, possibly, lamivudine chemoprophylaxis.
- Draw a baseline specimen from the patient to determine pre-exposure HIV status.
- Retest the patient at 3 and 6 months.
- Failure to convert to HIV-positive status at 6 months makes transmission highly unlikely. **Evidence Fair, recommendation B**

("Bloodborne pathogens," 2007; Canadian Pediatric Society, 2005; Centers for Disease Control & Prevention [CDC], 2006; Havens, 2003; "Medical management of exposures," 2007; New York State Department of Health, 2004; Pretty, Anderson, & Sweet, 1999; Weinbaum, Lyerla, & Margolis, 2003).

Definitions:

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CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is specifically stated for selected recommendations (see "Major Recommendations" field.)

These guidelines are based on sources such as research studies (randomized controlled trials, retrospective cohort studies, prospective case studies, case control studies, and controlled observational studies), meta-analysis reviews, systematic literature reviews, expert opinion, and practice guidelines and position statements from professional organizations (Infectious Diseases Society of America, Center for Disease Control, American College of Surgeon's Medical Association, and American Family Physician).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Improved identification of patients with human bite wounds
- Improved management of patients with human bite wounds
- Improved treatment and management of patients exposed to human immunodeficiency virus (HIV), Hepatitis B, and Hepatitis C by human bites

POTENTIAL HARMS

- Adverse effects of medication
- Surgical risks of wound closure including scarring, infection, and disfigurement

CONTRAINDICATIONS

CONTRAINDICATIONS

- Antibiotics:
 - *Amoxicillin/Clavulanate*: hypersensitivity to drug, class, or components; history of hepatic dysfunction, history of cholestatic jaundice, mononucleosis.
 - *Alternate regimen of clindamycin plus either ciprofloxacin or trimethoprim/sulfamethoxazole or doxycycline*: ulcerative colitis, history of antibiotic associated colitis, anemia, folate deficiency, glucose-6-phosphate dehydrogenase (G6PD)-deficiency, less than two months old, pregnancy (near term), breastfeeding, less than 8 years old.
- Analgesia:
 - *Ibuprofen or acetaminophen or acetaminophen with codeine*: history of aspirin/nonsteroidal anti-inflammatory drugs (ASA/NSAID) induced asthma, urticaria, aspirin triad, 3rd trimester pregnancy, respiratory depression, paralytic ileus, hypersensitivity to drug, class, or components.
- Topical Antibiotics:
 - *Bacitracin*: hypersensitivity to drug, class, or components.
- Tetanus Prophylaxis: poliomyelitis outbreak, hypersensitivity to drug, class, or component.
- Hepatitis B, Hepatitis C, and Human Immunodeficiency Virus (HIV) Prophylaxis:
 - *Tenofovir*: creatinine clearance <60mL/min, renal insufficiency, pregnancy, and any hypersensitivity to drug, class, or components.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- These guidelines are not intended for use outside of the population.
- The skill and judgment of the health care provider must dictate treatment decisions.
- These guidelines provide a general framework for managing patients with human bite wounds. The major recommendations are not intended to be utilized all inclusively, and decisions must be based on individual symptoms and goals.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2007 May

GUIDELINE DEVELOPER(S)

University of Texas at Austin School of Nursing, Family Nurse Practitioner Program
- Academic Institution

SOURCE(S) OF FUNDING

University of Texas at Austin, School of Nursing, Family Nurse Practitioner Program

GUIDELINE COMMITTEE

Practice Guidelines Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

No relationship exists between the guideline developers and any for-profit and non-for-profit companies or organizations that could potentially influence the contribution to the guideline development.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: None available

Print copies: Available from the University of Texas at Austin, School of Nursing.
1700 Red River, Austin, Texas, 78701-1499

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI Institute on August 22, 2007. The information was verified by the guideline developer on November 9, 2007. This

summary was updated by ECRI Institute on July 28, 2008 following the U.S. Food and Drug Administration advisory on fluoroquinolone antimicrobial drugs.

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Date Modified: 11/3/2008

