Animal Bite Skin Soft Tissue Infection (SSTI)

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What is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.
Objectives of Pathway

- To standardize management of animal bites
- To recommend if vaccination and/or immune globulin prophylaxis are indicated
- To recommend if antibiotics are needed and if so, which are indicated based on patient’s wound type
- To recommend when pediatric surgery/trauma consult is indicated
Why is Pathway Necessary?

- Animal bites are a common reason for presentation to the Emergency Department and pediatric and surgical offices.
- The Infectious Diseases Society of America updated their Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections in 2014, and these guidelines include recommendations for animal and human bite wounds prevention and treatment.
- The Connecticut Children’s Animal Bite clinical pathway was developed to ensure an optimal consistent approach to the surgical and medical management of children who present with animal bites.
This is the Animal Bite Skin Soft Tissue Infection Clinical Pathway.

We will be reviewing each component in the following slides.
• Inclusion criteria includes an animal bite (from cat, dog, human) in a patient ≥2 months of age
• Exclusion criteria includes:
  • Patients <2 months of age
  • Animal bite that is NOT from a cat, dog or human
  • Any non-animal bite SSTI
  • May want to consider an ID consult if exclusions are present
Initial management:
1. Apply direct pressure to any wounds that are actively bleeding.
2. Clean non-puncture wounds with saline via high pressure syringe irrigation.

Considerations:
- Consider tetanus prophylaxis (discussed later).
- For dog and cat bites: consider rabies prophylaxis (discussed later).
- For human bites:
  - Consider Hep B vaccination if unvaccinated.
  - Assess risk for HIV infection and see HIV Post-Exposure Prophylaxis (PEP) pathway.

Tetanus Vaccine and Immunoglobulin Considerations
- If the patient has completed primary Tetanus series, is up to date on Tetanus vaccination, and received a dose in the past 5 years (past 10 years for patients with minor wounds): no Tetanus prophylaxis is indicated.
- If the patient is up to date on Tetanus vaccine but has not completed DTaP series (4 vaccines in total), provide a dose of DTaP if the minimum interval has occurred. Need for TIG (Tetanus immunoglobulin) should also be assessed (see below).
- If the patient received at least 3 doses of a Tetanus containing vaccine, no TIG is needed. If the patient has received fewer than 3 doses of a Tetanus containing vaccine, TIG is only needed for wounds that are NOT clean and NOT minor.

Rabies Prophylaxis Considerations
- If the animal is in the home and appears healthy, can observe it for 10 days; no prophylaxis is needed unless animal begins to have symptoms.
- If the animal is suspected to have symptoms or it is unknown, Rabies prophylaxis should be administered.
- Please see Appendix A for Rabies vaccine and immunoglobulin administration details.
Assess for wound severity:
Evaluate presence of infection, location, involvement, and underlying immunocompromise

If the wound is simple, clean, non-infected, and the patient is healthy:
• Antibiotics are not necessary
• Ensure that patient has follow up in 24-48 hours for re-assessment.
If a wound is significant, a distinction must then be made as to wound complexity.

A major or complex wound will contain any of the following:
- devitalized tissue
- heavy contamination
- associated injury
- any perineal wound
A major or complex wound requires surgical washout and/or closure.

- Consult pediatric surgery/trauma service
- If the wound looks infected, obtain wound cultures (anaerobic and aerobic)
- If there are overt signs/symptoms of infection, also obtain blood cultures (anaerobic and aerobic)
For major or complex wounds:

Initiate the appropriate IV antibiotic treatment plan

**IV antibiotic options:**

- **Ampicillin-Subactam IV** 200 mg/kg/day of Ampicillin component divided q6hr (max 3000 mg/dose)

**OR** if Penicillin allergic (and tolerates cephalosporins):

- Ceftriaxone 50 mg/kg daily (max 2 gram/dose) AND Clindamycin IV 30-40 mg/kg/day in 3 divided doses (max 600 mg/dose)

**OR** if allergic to BOTH Penicillin and Cephalosporins:

- Clindamycin IV 30-40 mg/kg/day in 3 divided doses (max 600 mg/dose) AND TMP-SMX IV 8-10 mg/kg/day in 2 divided doses (max 160 mg TMP/dose)
A contaminated wound **without** associated injuries is considered a significant wound, but does not require surgical treatment.

- If the wound looks infected, obtain wound cultures (anaerobic and aerobic)
Examples of overt signs/symptoms of infection include:

- Failing outpatient therapy
- Wound is rapidly (i.e. within hours) progressing

**Oral antibiotic options:**
- Amoxicillin/Clavulanate ES 90 mg/kg/day (of amox component) in 2 divided doses (max 1 gram/dose)

**OR if Penicillin Allergic:**
- If Penicillin allergic and > 8 years old: Doxycycline PO 4 mg/kg/day in 2 divided doses (max 100 mg/dose) OR
- If Penicillin allergic any age: Clindamycin PO 30-40 mg/kg/day in 3 div doses (max 600 mg/dose) AND TMP-SMX PO 8-10 mg/kg/day in 2 div doses (max 160 mg TMP/dose)

**Treat with PO antibiotics for 3-5 days**
If there are overt signs/symptoms of infection:
  • Consider ID consult
  • Obtain blood cultures (anaerobic and aerobic)
  • And start IV antibiotics
After IV antibiotics are started, assess for clinical improvement:

- Includes, at minimum, no worsening at 24 hours and improving after 48 hours.
If no clinical improvement:

- Consider and ID consult
- Consider treating off the pathway

**IV antibiotic options:**

- Ampicillin-Sulbactam IV 200 mg/kg/day of Ampicillin component divided q6hr (max 3000 mg/dose)

OR if Penicillin allergic (and tolerates cephalosporins):

- Ceftriaxone 50 mg/kg daily (max 2 gram/dose) AND Clindamycin IV 30-40 mg/kg/day in 3 divided doses (max 600 mg/dose)

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Clinical Improvement?

- No
  - Consider Peds ID consult and/or treat off pathway
- Yes
  - Transition to oral antibiotics for a total of 7 days
If clinical improvement is noted:

- Transition to oral antibiotics
- Antibiotic course should be a total of 7 days

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If there are no overt signs and symptoms of infection:

- Begin treatment with the appropriate ORAL antibiotic
- Antibiotic course should be a total of 3-5 days
Discharge instructions include:

- Clinical improvement
- Afebrile for 24 hours
- Tolerating ORAL medications
- Adequate follow up in place
  - 24 – 48 hrs after discharge

Discharge Criteria: Clinically improved, afebrile for 24 hours (if presented with fever), tolerating PO medications, adequate follow-up in place

Discharge Instructions: Complete antibiotic course as above; follow surgeon’s discharge instructions as applicable; if started on rabies vaccination: follow up with Infectious Disease outpatient for subsequent vaccines by placing a referral through One Call (1-833-733-7669); ensure plan in place for suture removal; ensure adequate follow-up in 24-48 hours to assess for signs/symptoms of infection
Special Considerations: Tetanus

• NO NEED for Tetanus prophylaxis if:
  • The patient completed their primary tetanus series
  • Is up to date on tetanus vaccination
  • and received a dose in the past 5 years (past 10 years for patients with minor wounds)

1. Tetanus Vaccine and Immune Globulin Considerations
   • If the patient has completed primary Tetanus series, is up to date on Tetanus vaccination, and received a dose in the past 5 years (past 10 years for patients with minor wounds): no Tetanus prophylaxis is indicated.
   • If the patient is up to date on Tetanus vaccine but has not completed DTaP series (4 vaccines in total), provide a dose of DTaP if the minimum interval has occurred. Need for TIG (Tetanus immunoglobulin) should also be assessed (see below).
   • If the patient received at least 3 doses of a Tetanus containing vaccine, no TIG is needed. If the patient has received fewer than 3 doses of a Tetanus containing vaccine, TIG is only needed for wounds that are NOT clean and NOT minor.

2. Rabies Prophylaxis Considerations
   • If the animal is in the home and appears healthy, can observe it for 10 days; no prophylaxis is needed unless animal begins to have symptoms.
   • If the animal is suspected to have symptoms or it is unknown, Rabies prophylaxis should be administered.
   • Please see Appendix A for Rabies vaccine and immunoglobulin administration details.
Special Considerations: Tetanus
When Tetanus prophylaxis is needed:

- Give DTaP (or Tdap if > 7yrs) if:
  - The patient is up to date on tetanus vaccine but has not completed DTaP series (4 vaccines in total) and the appropriate time interval has passed between vaccines

- Assess need for TIG (tetanus immunoglobulin):
  - No TIG needed if: the patient has received at least 3 doses of a Tetanus containing vaccine
  - TIG needed only for:
    - Major/Complex and/or infected wounds
    - Patient has received less than 3 doses of Tetanus containing vaccine

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1. **Tetanus Vaccine and Immunoglobulin Considerations**
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2. **Rabies Prophylaxis Considerations**
   - If the animal is in the home and appears healthy, can observe it for 10 days; no prophylaxis is needed unless animal begins to have symptoms.
   - If the animal is suspected to have symptoms or it is unknown, Rabies prophylaxis should be administered.
   - Please see Appendix A for Rabies vaccine and immunoglobulin administration details.
Special Considerations: Rabies

- If the animal is in the home and appears healthy: observe for 10 days; no prophylaxis is needed unless animal has symptoms.
- If the animal is suspected to have symptoms or it is unknown, give rabies prophylaxis (vaccine and immune globulin).

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1. Tetanus Vaccine and Immune Globulin Considerations
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2. Rabies Prophylaxis Considerations
   - If the animal is in the home and appears healthy, can observe it for 10 days; no prophylaxis is needed unless animal begins to have symptoms.
   - If the animal is suspected to have symptoms or it is unknown, Rabies prophylaxis should be administered.
   - Please see Appendix A for Rabies vaccine and immunoglobulin administration details.
Special Considerations: Rabies

Rabies vaccine:
- 2 types: Rabavert (preferred); Imovax (reserved for those with severe egg allergy)
- Administration site: deltoid OR outer aspect of thigh for young patients
  - Do NOT give in gluteal muscle
- Refer to Appendix A for administration schedule

Rabies Immunoglobulin:
- Dose 20 IU/kg given in single dose
- Administration:
  - Give as soon as possible after exposure
  - Give full dose around/into wound(s), if possible
  - Any remaining volume should be given IM at site distant from the vaccine administration site

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2. Rabies Prophylaxis Considerations
   - If the animal is in the home and appears healthy, can observe it for 10 days; no prophylaxis is needed unless animal begins to have symptoms.
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   - Please see Appendix A for Rabies vaccine and immunoglobulin administration details.
Tetanus Vaccine and Immuno globulin Considerations

- If the patient has completed primary Tetanus series, is up to date on Tetanus vaccination, and received a dose in the past 5 years (past 10 years for patients with minor wounds): no Tetanus prophylaxis is indicated.
- Administration site: typically deltoid, or for young patient may use outer aspect of thigh.
- Dose: 1 ml/dose
- Administration Schedule:
  - Immunocompetent patients: give on days 0, 3, 7, and 14.
  - Immunocompromised patients: give on days 0, 3, 7, 14 and 28.
  - Patients who have had rabies vaccine in the past: give on days 0 and 3.

Rabies Vaccine Administration

- Two vaccines are available on the market: Rabavert (preferred) and Imovax (reserved for those with severe egg allergy).
- Administration site: typically deltoid, or for young patient may use outer aspect of thigh.
- Dose: 20 IU/kg given in a single dose
- Administration:
  - Give as soon as possible after exposure.
  - If possible, give the full dose around/into the wound(s).
  - Any remaining volume should be administered IM at a site distant from the vaccine administration site.

Rabies Immunoglobulin Administration

- Dose: 20 IU/kg given in a single dose
- Administration:
  - Give as soon as possible after exposure.
  - If possible, give the full dose around/into the wound(s).
  - Any remaining volume should be administered IM at a site distant from the vaccine administration site.

Rabies Prophylaxis Considerations

- If the animal is in the home and appears healthy, can observe it for 10 days; no prophylaxis is needed unless animal begins to have symptoms.
- If the animal is suspected to have symptoms or it is unknown, Rabies prophylaxis should be administered.
- Please see Appendix A for Rabies vaccine and immunoglobulin administration details.
Review of Key Points

• Inclusion criteria includes an animal bite (from cat, dog, human) and the patient is \geq 2 months of age

• Consider Tetanus, Rabies, Hepatitis B and HIV prophylaxis in select circumstances
  o Remember to consider tetanus vaccine and immunoglobulin with all animal bites, and rabies prophylaxis with dog and cat bites

• Assess wound severity to determine treatment
  o Minor, non-infected wounds need no antibiotics

• If there are overt signs/symptoms of infection, obtain anaerobic AND aerobic blood cultures

• The preferred/first choice IV antibiotic is ampicillin-sulbactam
Quality Metrics

- Percentage of eligible patients with use of Animal Bite order set
- Percentage of patients who receive the recommended antibiotics per pathway
- Percentage of patients who were prescribed the correct duration of antibiotics based on severity
- Average LOS for ED (hours) and admitted patients (days)
- Returns to ED within 7 days from first ED visit
- Returns to ED within 7 days of discharge from inpatient/observation stay
Pathway Contacts

- Brendan Campbell, MD, MPH
  - Department of Pediatric Surgery and Trauma

- Jennifer Girotto, PharmD
  - Antimicrobial Stewardship Program

- Grace Hong, APRN
  - Pediatric Infectious Diseases
References


About Connecticut Children’s Pathways Program

Clinical pathways guide the management of patients to optimize consistent use of evidence-based practice. Clinical pathways have been shown to improve guideline adherence and quality outcomes, while decreasing length of stay and cost. Here at Connecticut Children’s, our Clinical Pathways Program aims to deliver evidence-based, high value care to the greatest number of children in a diversity of patient settings. These pathways serve as a guide for providers and do not replace clinical judgment.

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