Children's Hospital and Health System, Inc.
Patient Care Treatment Guideline
CW Urgent Care

SUBJECT: Insect Bites and Stings

Purpose: To evaluate and initiate treatment of insect bites and stings. *If there are any concernsof anaphylaxis, the CW Urgent Care anaphylaxis workflow should be immediately initiated.*

Definition: Insect bites and stings are common and usually benign. Most reactions are mild and localized, but sometimes they are more pronounced and rarely even life-threatening. More advanced reactions include large local reactions and systemic allergic and anaphylactic reactions. A common concern is the possibility of a secondary bacterial infection, especially cellulitis. Secondary infections are relatively uncommon, but it is important to recognize and treat if present.

Etiology: Typical reactions to bites and stings are caused by an immunologic response to proteins in the saliva of the insect. The more serious reactions are usually caused by an allergic reaction.

Differential Diagnosis

- Current or evolving anaphylaxis
- Lyme Disease: consider if target-type lesion present, especially with a history of a tick bite
- Secondary bacterial infection.
    - The stings of yellow jackets and fire ants are more likely to become infected than others.
    - Most infections occur as the result of scratching the lesion.
    - May be difficult to differentiate between allergic inflammation and inflammation caused by a secondary bacterial infection on exam. *The timing of the symptoms is the most important clue to infection versus just inflammation.*
    - Suspect infection when:
        - Redness, swelling and pain become dramatically worse **three to five days** after a sting or bite, when the typical large local reaction should begin to regress.
        - Symptoms worsen or are not improving after 1 to 2 days of treatment for inflammation.
        - Presence of fever (more than low grade).
        - Presence of pustules or purulent drainage
        - Significant **tenderness** to the site to touch; pain is more prominent than pruritus.
        - Lymphangitis streaks may occur with either infection or large local reaction.

Guideline

Subjective Data/History

- Timing and location of the bite or sting
- Type of insect causing the symptoms (if possible)

Objective Data/Physical Exam

- Determine the type of reaction

REACTION TYPE	INSECT	COMMENTS
Typical Local Reaction	Mosquito	• Immediate wheals or swelling with surrounding flares/redness • Onset within minutes • Delayed itchy, indurated/firm papules which peak in hours and may last for several days
	Fire Ant	• Pustule-like lesions at the site of the sting within about 24 hours • May be intensely pruritic
	Spider bite	• May cause target-type lesions (consider Lyme Disease as differential)
	Wasp, Bee, or Hornet	• Redness and an area of painful swelling (1-5 cm) at the site • Onset within minutes and usually resolves within a few hours to a few days
Large Local Reaction (Skeeter Syndrome)	Mosquito	• Most common type of allergic reaction to mosquito bites (~10% of people develop) • Typically consists of an itchy or painful area of redness, warmth, swelling, and/or induration that ranges from a few centimeter to more than 10 cm in diameter • Develop within hours of the bite, progress over 8 hours to 1 to 2 days and resolve within 3 to 10 days • May involve the entire periorbital region, much of the face or an entire extremity, especially in ayounger child. May interfere with function of the eyes, mouth, or extremity • A low grade fever and malaise may be present • May occasionally have an ecchymotic appearance or be associated with blisters, vesicles, or bullae
Systemic allergic reactions and anaphylaxis	Any	• Most dangerous immediate reaction to Hymenoptera stings (i.e. bees, wasps, hornets, and yellowjackets); occurs in up to 3% of stings • Anaphylaxis may be rapid in onset and even cause death; it must be addressed **immediately** if there is **any** suspicion of this type of reaction • Most systemic reactions to mosquito bites are topical; anaphylactic reactions to mosquito bites arevery rare
Miscellaneous reactions	Any	• **Toxic reactions to numerous stings** may cause symptoms such as nausea, vomiting, diarrhea, headache, vertigo, syncope, convulsions, and fever; rarely hemolysis, cardiac complications, renal failure, and rhabdomyolysis have been described • **Delayed type reactions** such as serum sickness, vasculitis, neuritis, myocarditis, or encephalitis are rare

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Diagnostic Studies - none indicated

Treatment

1. Rule out current or evolving anaphylaxis. If any signs or symptoms are present, or the patient was stung and may be allergic to stinging insects, **immediately** begin treatment for anaphylaxis. *Most episodes of venom anaphylaxis develop rapidly.* About 30% of children with allergic reactions to venom develop cardiopulmonary symptoms.
    - **Assess and manage patient and call 911. Arrange for transfer to ER immediately.**
    - Intramuscular epinephrine should be given to children who present with skin findings, including generalized urticaria, and **any** symptoms beyond the skin, **or** if the patient has a history of past sting-induced anaphylaxis:
        - **Patient < 25 kg (55 pounds), give IM epinephrine 0.15 mg (EpiPen Jr)**
        - **Patient ≥ 25 kg (55 pounds), give IM epinephrine 0.3 mg (EpiPen)**
        - **If no epinephrine auto injector is available for use, draw up epinephrine 1:1000 (1 mg/ml) concentration into a syringe 0.15 mg (0.15 ml) or 0.3 mg (0.3 ml) based on the dose desired.**
    - See CW Urgent Care Anaphylaxis Evidence Based Guideline for additional guidance
    - For patients presenting with urticaria without **any** other systemic symptoms **or** history of anaphylaxis:
        - Administer Cetirizine 1mg/ml in clinic.
        - Consider continued cetirizine and oral prednisone for use at home.
        - If concerns of systemic or worsening symptoms, begin anaphylaxis workflow and arrange transfer to ER.
    - Patients discharged after treatment of any severe or systemic allergic reaction should be provided with an EpiPen (at least two doses), instructions on when and how to use the EpiPen, and a referral to CW asthma/allergy/immunology.

2. Typical local reactions and large local reactions:
    - Remove any stinger that may be present. Avoid opening pustules related to fire ant stings.
    - Offer non-prescription symptomatic care for mild itching, swelling and pain such as:
        - Oral cetirizine (Zyrtec) or other nonsedating antihistamine for itching
        - Calamine lotion or an itch relieving cream such as Sarna or Aveeno
        - A paste of baking soda and water
        - Cool compresses

        - 1% Hydrocortisone cream or ointment
        - Pain control with ibuprofen or acetaminophen
        - The limb should be elevated if the sting is on an extremity.
    - Papular urticaria
        - This can be a recurrent reaction after insect bites or stings.
        - The patient should continue antihistamines daily until one week after symptom resolution.

3. Significant bite or sting reactions:
    - Oral antihistamine such as Cetirizine daily, continue for a week beyond clearance of symptoms.
    - Add Benadryl or Hydroxyzine at night if needed.
    - Prescription topical steroids to the more inflamed and itchy lesions:
        - Hydrocortisone 2.5% ointment or Triamcinolone 0.025% ointment to face, folds or milder lesions.
        - Triamcinolone 0.05% or 0.1% ointment or mometasone 0.1% ointment to more symptomatic lesions on the body only. These can be used 2 times a day for up to 10 days as needed.
        - Do NOT prescribe a class I topical steroid (ultra-high potency topical corticosteroid) to pediatric patients for bite or sting reactions.
    - Consider a short course of oral steroids only for a very large symptomatic bite or sting, or numerous bites, especially if affecting function (vision, eating/drinking, or ambulation). Use prednisone or prednisolone 1 mg/kg daily up to 50 mg for up to 5 days.
    - Antibiotics are usually **not** indicated for reactions that develop within 2 days of the bite or sting.
    - Hymenoptera (Hymenoptera is a large order of insects, including sawflies, wasps, bees, and ants) stings are considered clean for the purposes of tetanus vaccination. A tetanus booster is not necessary unless there was a concomitant soil-contaminated injury.

4. Concern of secondary bacterial infection:
    - Obtain culture if open, weeping, crusting areas are present. Do not swab / culture intact skin
    - Apply warm compresses to area if fluctuant.
    - Mild / superficial skin infections may be treated with topical mupirocin
    - If cellulitis or more extensive infection is present, treat with Cephalexin for 5-7 days and change only if not responding or if culture confirms insensitivity. If concern of allergy or intolerance to cephalosporin, consider Clindamycin or TMP/Sulfa.

5. Toxic reactions to numerous stings:
    - Prompt removal of any insects or stingers still attached to the skin or entrapped in the

patient's clothing.
- Immediate transfer to ER for patients with significant reactions. Follow anaphylaxis workflow if indicated.

Education of Patient/Family

- Include in the AVS Urgent Care discharge instructions entitled "Insect Bite or Sting" (.ucdcinsectbite).
- Avoid topical products with local anesthetics or H1-antihistamines (such as Benadryl cream) due to the possibility of systemic absorption and contact hypersensitivity.
- Elevate an area of significant swelling.

Follow-up

- Recheck by PMD within 48 hours of treatment if there are concerns of infection.
- For worsening symptoms.

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Treatment information also provided by Joree Ruiz, PA, Dermatology, Children's Wisconsin, and by Jeanne Conner, APNP, Allergy/Asthma, Children's Wisconsin (personal communications, December 2021).

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