

## The *Buzz* About Insect Bites and Stings

Insect bites and stings are common occurrences in the summer months and can be very bothersome and even dangerous. They can, however, mostly be avoided. Knowing the most common types of insects and being familiar with the complications that their bites can cause should prepare you for the season. Learn how to recognize the symptoms associated with each type of bite and how to treat them.

### Why Do Insects Attack?<sup>1</sup>

Nonvenomous insects, such as mosquitoes, ticks, and chiggers, usually bite their victims when they are hungry. Once the skin is pierced, the insect sucks the blood of the host in order to feed. Venomous insects, such as bees, wasps, hornets, and yellow jackets, only attack when they feel threatened. They usually sting when they are trying to defend themselves.

### Types of Insects<sup>1</sup>

**Mosquitoes** are found worldwide and are most commonly seen between late spring and early fall. They are most active at dusk and dawn when it is hard for us to see them. They prefer humid, warm climates and live and breed near moisture because their larvae can only live in water. Most people do not know that only the female mosquito is capable of biting. Unfortunately, they are also the carriers of many diseases, such as malaria and West Nile virus, which are transmitted to humans and animals.

**Ticks** transmit diseases, such as Lyme disease and Rocky Mountain spotted fever, both caused by bacteria. They too feed on their human and animal hosts by sucking their blood.

**Chiggers**, also known as redbugs, primarily live in bushes, trees, and grass. Their bites cause intense itching. Only their larvae are capable of biting. The larvae secrete a fluid into the skin of their host. This causes disintegration of the tissue in the area bitten.

**Bees, wasps, hornets, and yellow jackets** use a stinger to inject venom into their victims. Only females have a stinger attached to their abdomens; males are stingless. When bees inject their stinging apparatus into the skin of their victims, it detaches from the rest of the bee, and the bee later dies. In contrast, wasp, hornet, and yellow jacket stingers do not detach, so they can continue stinging others.

### How Can I Avoid Being Bitten or Stung?

The most important thing anyone can do to avoid being bitten by any of these insects is to wear protective clothing. Pants, long-sleeved shirts, hats, and shoes covering the skin will make it more difficult for insects to penetrate the skin. Insect repellents may also prevent a bite from a mosquito, tick, or chigger but are not effective in repelling stinging insects.<sup>1</sup>

N,n-diethyl-m-toluamide, also known as DEET, is the most effective insect repellent available on the market. It works by releasing vapors into the surrounding air that discourage the insect from approaching. DEET is available in many different products such as aerosol sprays, liquids, creams, and wristbands. However, wristbands do not seem to be effective. When applied according to the directions, DEET is a safe repellent for use in adults and children as young as 2 months old. It is available in concentrations ranging from approximately 10 percent to 100 percent. The higher the concentration, the longer it will repel insects.<sup>1,2</sup>

Apply DEET to exposed areas of skin any time you are outside, especially during the summer months when insects are the most abundant. It can also be applied to your clothing but should never be applied underneath clothing. Never apply to cuts, wounds, or irritated skin. Never allow children to apply DEET to themselves. An adult should apply it to the child, taking care to avoid eyes, mouth, ears, and hands. Remember that children often put their hands in their mouths. When applied properly, DEET is very safe and rarely causes adverse reactions, the most common being skin irritation.<sup>1,2</sup>

For protection against insects and ultraviolet rays, apply DEET with sunscreen. Apply sunscreen first, then apply repellent, following the package instructions for each product. Using a combination product is not recommended because sunscreen usually has to be reapplied more frequently.<sup>2</sup>

Because insect repellents do not deter stinging insects, it is important to know how to reduce your risk of being stung. Here are a few tips to follow when you are outdoors.<sup>3</sup>

- Wear light-colored clothing and avoid wearing perfumed soaps, shampoos, and deodorants.
- Wear clean clothing and have good personal hygiene because sweat angers bees.
- Avoid flowering plants because bees are often attracted to them.
- Clean up picnic areas and pick up garbage; wasps thrive in these areas.
- Do not swat or swing at a stinging insect flying around you. It may sting you.

### **Treatment Options<sup>1</sup>**

Learn how to treat the affected area if you do get stung or bitten. The main goals of treating insect bites and stings are to reduce the pain, swelling, and itching and to avoid secondary infections, which can result from scratching. If you get stung, try to remove the stinger by scraping the stung area with a credit card or fingernail. Never squeeze or rub the area because that can potentially release more venom. Apply an ice pack to either a bite or a sting to relieve the pain and irritation. If additional relief is needed, apply topical agents such as anesthetics and antihistamines. The following table provides information about some common over-the-counter products for symptomatic treatment of insect bites and stings. Generally, topical anesthetics or skin protectants are used for symptomatic relief; however, if you are allergic to anesthetics, use a counterirritant, topical antihistamine, or hydrocortisone.

When using these topical products, remember the following:

- Do not use for longer than 7 days.
- Consult your physician if any significant reaction occurs on the skin or particularly if it occurs systemically.

- Do not use these products in children under 2 years old.
- Do not use with occlusive dressings.

Oral agents, such as antihistamines, are also available but are generally reserved for use after a medical consultation.

Base the choice of a particular product on specific ingredients. Preference will be based on personal experience and medical history.

**Table 1:** Nonprescription Products for Symptomatic Relief of Insect Bites and Stings<sup>1</sup>

<b>Products</b>	<b>General Information</b>
<b>Local Anesthetics</b> <ul style="list-style-type: none"> <li>• Benzocaine (<i>Americaine</i>)</li> <li>• Pramoxine (<i>Itch-X</i>)</li> <li>• Benzyl alcohol*</li> <li>• Lidocaine (<i>Solarcaine</i>)</li> <li>• Dibucaine (<i>Nupercainal</i>)</li> <li>• Phenol*</li> </ul>	<ul style="list-style-type: none"> <li>• Relieves itching, irritation, and pain.</li> <li>• Available in cream, ointment, aerosol, or lotion.</li> <li>• Apply 3 to 4 times a day, up to 7 days.</li> <li>• May cause local sensitivity reactions (redness, itching).</li> </ul>
<b>Antihistamine</b> <ul style="list-style-type: none"> <li>• Diphenhydramine HCl (<i>Benadryl</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Relieves itching and pain.</li> <li>• Available in tablet, capsule, liquid, cream, gel, or spray.</li> <li>• Apply 3 to 4 times a day, up to 7 days.</li> <li>• May produce an allergic reaction or cause increased sun sensitivity when used for more than 7 days.</li> </ul>
<b>Counterirritants</b> <ul style="list-style-type: none"> <li>• Camphor (<i>Band-Aid Anti-Itch Gel</i>)</li> <li>• Menthol*</li> </ul>	<ul style="list-style-type: none"> <li>• Relieves itching, irritation, and pain.</li> <li>• Apply 3 to 4 times a day, up to 7 days.</li> </ul>
<b>Hydrocortisone</b> ( <i>Cortaid, Lanacort</i> )	<ul style="list-style-type: none"> <li>• Relieves itching, inflammation, and pain.</li> <li>• Available in the form of cream, gel, lotion, ointment, spray, or stick.</li> <li>• Apply 3 to 4 times a day, up to 7 days.</li> <li>• Since hydrocortisone suppresses the immune system, its use may predispose to a secondary infection at the site of application.</li> <li>• Do not use if you have scabies, an existing fungal or bacterial skin infection.</li> </ul>
<b>Skin Protectants</b> <ul style="list-style-type: none"> <li>• Zinc oxide</li> <li>• Calamine*</li> </ul>	<ul style="list-style-type: none"> <li>• Act as protectants and reduce inflammation and irritation.</li> <li>• Calamine and zinc oxide absorb fluid from oozing lesions.</li> <li>• Available in lotion, ointment, and cream.</li> <li>• Apply as needed.</li> </ul>

\* Only available in combination products

Trade names are offered only as examples and imply no exclusiveness or endorsement.

## Complications

Certain insect bites and stings can be harmful to the victim if treatment is delayed. It is important to recognize the symptoms associated with a dangerous bite and know when to seek appropriate medical attention.

**West Nile virus:** As mentioned earlier, mosquitoes can transmit West Nile virus, a potentially serious illness. People who spend a lot of time outdoors are at greatest risk of being bitten by an infected mosquito. If you have been bitten by a mosquito infected with West Nile virus, you may or may not have symptoms. The majority of infected

people have no symptoms at all. The most common things to watch for are fever, headache, body aches, nausea, vomiting, and sometimes swollen lymph nodes or a skin rash. While these symptoms may seem mild, people have died from West Nile virus complications, such as encephalitis and meningitis. People over age 50 are most likely to develop the serious West Nile virus symptoms of stupor, paralysis, vision loss, convulsions, and coma. No specific treatment is available for West Nile virus, only supportive care.<sup>4</sup> If you experience any of these symptoms, seek medical attention.

**Lyme Disease:** Lyme disease is transmitted by the bite of a deer tick infected with the bacterium *Borrelia burgdorferi*. Symptoms usually appear within 2 to 4 weeks and may include a small, red bull's eye rash that gets progressively larger, fever, headache, muscle and joint pain, and neck stiffness. Treatment involves a 3- to 4-week course of antibiotics, such as doxycycline or amoxicillin. If left untreated, more serious complications involving the brain and spinal cord, heart, and joints can develop.<sup>5</sup> Don't delay seeking treatment if infection is suspected.

**Rocky Mountain Spotted Fever:** Caused by the bacterium *Rickettsia rickettsii*, Rocky Mountain spotted fever is a disease spread to humans by infected ixodid (hard) ticks. The classic triad of symptoms is fever, rash, and history of tick bite. Other symptoms that may also appear include nausea, vomiting, severe headache, loss of appetite, muscle pain, abdominal pain, and diarrhea. A rash on the wrists, forearms, and ankles usually appears 2 to 5 days after the onset of fever. Other areas involved may include the palms of the hands or soles of the feet. Doxycycline is the drug of choice for treating Rocky Mountain spotted fever in nonpregnant adults and children.<sup>6</sup> As with Lyme disease, initiating therapy as soon as possible can prevent serious complications later.

**Allergic Reactions:** Insect stings often cause severe, allergic reactions, such as hives, facial swelling, a drop in blood pressure, light-headedness, difficulty breathing, or even loss of consciousness often referred to as an anaphylactic reaction. In this situation, emergency treatment is warranted to avoid complications and even death. The drug of choice for anaphylactic reactions is injectable epinephrine. Patients with severe allergic reactions to insect stings should consider wearing a medical ID bracelet and carrying an EpiPen allergy kit where appropriate.<sup>1,7</sup>

## Conclusions

Using insect repellents and avoiding contact with insects are the best methods to prevent bites and stings. If you fail to prevent an insect bite or sting, know how to treat it with the appropriate over-the-counter products for symptomatic relief. Be familiar with the different types of insect bites and stings so you can recognize secondary disease symptoms that could be dangerous. Being prepared for a serious incident, such as an allergic reaction, can help ensure a safe summer. More importantly, being able to recognize signs of serious infections and seeking the appropriate medical attention if necessary can save a life—maybe even your own.

## References:

1. Buff W. Insect Bites and Stings and Pediculosis. In: Berardi RR, McDermott JH, Newton GD, Oszko MA, Popovich NG, Rollins CJ, et al. Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care. 14<sup>th</sup> ed. Washington, DC: American Pharmacists Association; 2004. p. 889-912.
2. Anonymous. Insect Repellent Use and Safety. Centers for Disease Control and Prevention. Available at [http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect\\_repellent.htm](http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm). Last updated July 28, 2003. Accessed on April 2, 2004.
3. Cyr DL, Johnson SB. First Aid for Bee and Insect Stings. University of Maine Cooperative Extension; 1995. Available at <http://www.cdc.gov/nasd/docs/d000701-d000800/d000800/d000800.html>. Accessed on April 21, 2004.
4. Anonymous. West Nile virus: What You Need to Know. Department of Health and Human Services, Centers for Disease Control and Prevention. June 9, 2003. Available at [http://www.cdc.gov/ncidod/dvbid/westnile/West Nile virus\\_factSheet.htm](http://www.cdc.gov/ncidod/dvbid/westnile/West Nile virus_factSheet.htm). Accessed on April 22, 2004.
5. Anonymous. Questions and Answers about Lyme disease. Centers for Disease Control and Prevention. Last reviewed November 18, 2003. Available at <http://www.cdc.gov/ncidod/dvbid/lyme/index.htm>. Accessed on April 22, 2004.
6. Anonymous. Rocky Mountain spotted fever. Centers for Disease Control and Prevention. Last reviewed August, 2000. Available at <http://www.cdc.gov/ncidod/dvrd/rmsf/index.htm>. Accessed on April 22, 2004.
7. Covington TR, ed. Nonprescription Drug Therapy. 2<sup>nd</sup> ed. St. Louis: Facts and Comparisons, 2003. pp. 207-17.

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