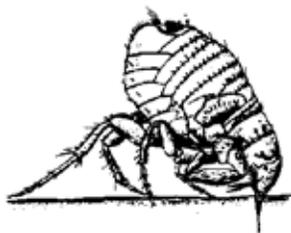
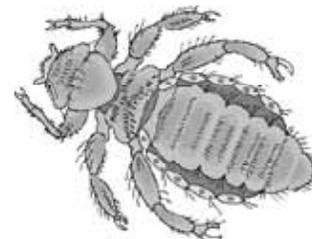


CHAPTER 42

Since the beginning of time, humans have been bitten and stung and fed upon by spiders, fleas, lice, hornets, bees, wasps, mites, ticks and other insects resulting in pain, infection, itching, disease and even death.



OUCH!



BITING, STINGING AND/OR BLOOD FEEDERS OVERVIEW

Have You Just Been Bitten or Stung?

What you don't know can hurt you.

**When it comes to bites and stings - prevention is your best medicine.
What can you do?**

First, learn which creatures can bite or sting.

Next, understand what you can do to avoid a problem.

Last, know what to do and whom to call if you get bitten or stung.

Check out the images at the below-mentioned web site:

<http://www.webmd.com/allergies/slideshow-bad-bugs>

Help is simply a phone call away. If you are bitten or stung, call your local health care provider or physician to determine if you can be treated at home, need to be seen by a physician or should go directly to a hospital emergency department. If you can be treated at home, your health care provider should keep in phone contact with you by calling back and checking on your condition. If your condition worsens, you should go to the nearest emergency department or call the paramedics or an ambulance. **The following suggestions are not intended to replace proper medical care. Always treat a small area before using any product, herb, oil, shampoo, soap, cleaner or any material you put on your body.**

Things you can do to prevent venomous bites or stings: (It helps if you do not look or smell like a flower or wear flashy jewelry.)

When hiking -

- ☺ Wear plain, light-colored clothing: long, heavy pants, long sleeves, netting and high-top, lace-up leather shoes or boots that cover the ankles.
- ☺ Watch out for snakes and stinging insects. Be extra cautious when daytime temperatures stay over 82° F. Snake encounters are more likely on south sides of slopes and hills.
- ☺ Use a walking stick - it can be a good hiking companion. It can be used in an emergency to help avoid a snake or creature.
- ☺ Carefully look around rocks or logs before stepping down.
- ☺ Watch for bee hives, colonies or swarms when outdoors - Don't poke at or touch them.
- ☺ Don't place your hands where you can't see.
- ☺ Be very cautious under rocks or logs.
- ☺ Don't wear scents of any kind, e.g., perfume, after shave or hair spray.

- ☺ Don't wave at, yell at, handle, annoy, touch or try to play with wild animals, spiders, stinging insects, snakes or Gila monsters. Walk around them if you can.

When camping - or at home -

- ☺ Check and shake bedding, clothes, boots and shoes before use.
- ☺ Do not leave any food around that is not tightly sealed in glass. Food odors attract insects and wildlife.
- ☺ Close and zip and then duct tape all tent closures during the night.
- ☺ Be aware that during the hot summer months rattlesnakes are more active and hunt at night.
- ☺ Keep a good first aid kit with you. A snake bite kit is usually not necessary.

THINGS YOU CAN DO TO PREVENT VENOMOUS BITES OR STINGS AROUND YOUR HOME:

- ☺ Get rid of rocks, mulch, litter, wood, paper, logs and debris from your yard.
- ☺ Wear plain, light-colored and long sleeved clothing, heavy work gloves, high top boots and long pants when working outside around your yard.
- ☺ Keep doors and windows tight fitting with good weather stripping.
- ☺ Make sure other openings (such as where air conditioners, swamp coolers or exhaust fans enter your house) are closed, sealed or fitted with a fine mesh screen and are dusted with talcum powder.
- ☺ Fill all cracks in the foundation of the house and around all water faucets.
- ☺ Look before you place your hand under or into something, especially rocks.
- ☺ Make periodic checks for bee hives or swarms; if found, carefully follow the directions in The Best Control II® or The Bug Stops Here®.
- ☺ Be very careful when operating vibrating equipment (lawnmowers, chain saws, weed eaters, etc.) that may disturb a fire ant, bee hive or wasp nest.
- ☺ Carefully check all line-dried clothing prior to bringing any of it inside the house.
- ☺ Do not leave shoes, boots, drinks, clothing items and towels outdoors.
- ☺ Always protect your feet and wear shoes when outdoors, especially around the pool at night.
- ☺ Don't aggravate stinging insects that approach you.
- ☺ Always check your clothing, bed and footwear before getting in them.
- ☺ For help in removing snakes or other venomous creatures from your property, read The Best Control II®. Call 1-800-221-6188 to order your CD-ROM copy.

Repellents - Bathing in a tub of warm water with 2 capfuls of chlorine bleach can repel insects, arachnids and/or mites for hours. Certain bath oils, Noxema, Vicks Vaporub and/or some sunscreens also can repel pests. Thiamine chloride (a B vitamin) taken orally or 60 milligrams of zinc taken daily also will act as a natural repellent. Safe Solutions Insect Repellent is a wonderful alternative to DEET.

Rattlesnakes

Rattlesnakes have a flattened, triangular shaped head with a heat-sensing device located between the nostril and eye on each side that is used to locate and trail prey. Different species of rattlesnakes can be of different lengths, with the Western Diamondback growing up from 10 inches at birth to 6 feet in length. The most common rattlesnakes include the Western Diamondback, Mohave, Sidewinder, Black-tailed, Speckled and Tiger. Rattlesnake bites are rarely fatal but can be extremely painful. Caution and common sense should be used. Most bites happen when you accidentally or purposely disturb or handle or play with the snake. It's far better to walk around or avoid it. Extra caution should be taken, especially when daytime temperature stays above 82° F. or 28° C. Baby rattlesnakes are typically born at the end of July and can bite at birth. The shaking of the rattle can serve as a warning but rattlesnakes can strike without warning or making any sound. They can strike ¼ to ½ of their body length. Coloring varies by species, but most blend with their environments, so they are extremely hard to see. **If you must kill them, wear protective clothing and use a shovel to decapitate them. Remember, even a severed head can still strike and kill!**

General Signs and Symptoms of a Snake Bites (Remember, at least 25% of all venomous snake bites in the USA are dry, or without venom being injected.)

- ☺ Immediate pain or a burning sensation generally will occur at the site of the bite.
- ☺ Fang marks are usually visible.
- ☺ A metallic or rubbery taste in the mouth.
- ☺ Significant swelling within minutes.
- ☺ Muscle weakness, sweating and/or chills, nausea and vomiting.

Note: A small percentage of rattlesnake bites are "dry," meaning that the snake has not injected venom. **But always seek medical help immediately.** Remember, protocols may vary from one hospital to another, so ask for the newest treatment. The venom injected contains several enzymes designed to attack tissue damage. The venom may also contain components that cause blood thinning and other effects on the body. The average cost to treat a venomous snake bite can be between \$15,000 and \$20,000 without medical complications, but almost half of the treated bites can become complicated, e.g., an allergic reaction to horse-based sera or to the venom itself. 95% of snake bites occur below the knees or below the elbows, so protect yourself!

Treatment

- ☹ *Don't* apply ice to the bite site or immerse the bite in a bucket of ice.
- ☹ *Don't* use a constricting band/cloth or tourniquet. Do not restrict blood flow in any manner.
- ☹ *Don't* cut the bite site or try to suck out the venom. Leave it bite site alone!
- ☹ *Don't* use electric shock or stun guns of any kind.
- ☹ *Don't* try to capture the snake to bring it to the hospital.
- ☺ *Do*, if you are not sensitive, take 2 - 3 droppers full of tincture of echinacea every hour for up to 12 hours in order to quickly activate the immune system.
- ☺ *Do* take high doses of vitamin C for its beneficial anti-allergy and antihistamine effects.
- ☺ *Do* use chewed crushed plantain leaves as they have antiinflammatory, antitoxic and antibacterial effects.

Seek medical help from a hospital emergency room or physician immediately. Back away quickly to prevent being bitten again. Identify the snake if you can. Rinse the bite area. Clean with soap and water or an antiseptic; apply a bandage or clean cloth. Remove constrictive items. Monitor for allergic reaction and/or shock. If possible and safe, remove venom. Keep victim as calm, relaxed and quiet as possible. Immobilize and splint the bitten extremity and then keep it below heart level. Don't allow the victim to drink alcohol, eat food or take any medications. You need to be evaluated and perhaps be administered antivenin. Move slowly if necessary to get help. You have time to reach medical care. Don't panic. Stay as calm as possible. If bitten on the hand, remove all jewelry before swelling begins. You can take echinacea internally and externally. Take high doses of vitamin C. Freshly crushed or chewed plantain leaves can be applied as a poultice. You can also make a daily poultice of echinacea, comfrey and/or calendula if you are not sensitive.

Lizard Bites from Gila Monsters

This large, heavy-bodied lizard displays contrasting markings of pink, yellow, orange and black. It measures up to 2 feet long and weights up to 2 pounds. It is the only venomous lizard in the United States, and it is a shy creature. Bites usually only happen when it is cornered or picked up. The Gila monster prefers canyon bottoms, rocky areas and outlying desert residential areas. It spends less than 2 weeks per year above ground. From early March to mid-May, Gila monsters are active during the day and this changes to nighttime beginning with the monsoons.

Signs and Symptoms of a Gila Monster Bite

A bite produces intense pain within 30 seconds, followed by swelling, weakness, dizziness, nausea and chills.

Treatment

Once a Gila monster bites, it does not generally let go. Therefore, you or someone with you may have to pull it off. The longer it remains on you, the more venomous the bite. Once off, wash the bite site with soap and water or an antiseptic to help remove some of the venom from the bite site. Apply ice or cold compresses to the area to help keep the venom localized. Do not wait for symptoms to occur: go to the closest medical facility or physician for treatment.

Scorpions

All U. S. scorpions can sting, but only the bark scorpion can cause serious medical problems. It chooses to live in well defined geographic areas. The small bark scorpion only measures from 1 to 1-½ inches in length. Its color varies from light tan to a dark golden brown. It also is the only scorpion that curls its tail to the side while at rest.

A nighttime feeder, it is most commonly found near irrigated areas, pools, in palm trees, concrete block fences and wooden fences and on the walls in homes. The bark scorpion is the only scorpion that can climb walls and walk across ceilings. It, therefore, can show up in bathtubs, sinks and beds, having fallen from the ceiling. It also has the ability to cling to the underside of wood, making it important to be extremely cautious when handling wood or outdoor furniture. Many times scorpions are found in cupboards, showers and other unexpected places. Scorpions are most active when the daytime temperatures are 70° F. or above.

Special Precautions

Because children under 10 years old are more likely to develop severe symptoms if stung by a scorpion, special care should be taken if you are visiting or reside in a bark scorpion-prone area:

- ☺ To prevent scorpions from either climbing or falling into the crib, place netting over the crib and place the crib legs in clean, wide-mouth jars.
- ☺ Place duct tape sticky-side up and secured with (masking) tape on the edges along the edges of walls and/or around the bed and/or furniture.
- ☺ Roll back bed linens and carefully inspect for scorpions before getting into bed.
- ☺ Shake and examine all clothing and shoes before putting them on.
- ☺ Move furniture and beds away from the walls.
- ☺ No bare feet; always wear shoes when outdoors, especially around a pool at night.
- ☺ Be especially careful of wet/damp towels in the bathroom and pool area.

Signs and Symptoms of a Scorpion Sting

In infants and children watch for excessive crying, rapid, jittery or uncoordinated eye movements and increased drooling or saliva. They constantly rub their noses and faces, indicating facial numbness, tingling and visual disturbances. Bark scorpion stings can cause one or several of the following symptoms, usually within the first 2 - 3 hours following the sting:

- ☺ Immediate local pain/burning/prickly sensation. **No swelling or redness.**
- ☺ The site of the sting is very sensitive; a slight touch causes great pain.
- ☺ Numbness and tingling moves from the sting site to distant body parts.
- ☺ Difficulty swallowing and “swollen tongue” sensation with excessive drooling.
- ☺ Slurred speech.
- ☺ Muscle twitching.
- ☺ Restlessness and irritability.
- ☺ Respiratory problems with possible respiratory arrest.

Treatment

Call your medical provider to determine whether the sting victim can be managed at home or will require medical treatment, e.g., intravenous medication to relieve muscle pain and spasm. **If in doubt, go to the emergency room.** Garlic has been used to relieve scorpion stings. It is thought the sulfur components help neutralize the toxins.

Black Widow Spiders

A mature female black widow spider has a large, black, shiny body and measures approximately 3/8 inch long, with 1 inch legs. An hourglass shape in bright red or orange-red color can be found on the abdomen. Black widow spider webs are very irregular, not in lively concentric rings; they are white and very strong. They are most often found in areas where water and insects are readily available. Around the home they can be found under or in outdoor furniture, barbecue grills, pool pumps and in storage areas, garages, wood piles, block fences and the corners of porches and patios.

The black widow is shy. She hides near the web by day and is most active at night where she waits in her web for prey to enter. She produces hundreds of babies hatched from egg sacs that look like little moth balls. The young black widows are white in color and spread quickly after hatching. The male black widow is much smaller and is brown and white in color. Because of its size, its bite cannot pierce skin and is, therefore, not dangerous to humans.

Black Widow Spider Control

A “live and let live” attitude is the best approach for living in harmony with all nature. But if you have a problem of close contact with the black widow or you have young children who play outside, you may have to take steps

to control the black widow population around your house. To control the black widow populations, locate the black widow spider, using a flashlight at night to find her in her web; then vacuum her and her web and her eggs up and safely dispose of the bag.

Signs and Symptoms of a Black Widow Spider Bite

The initial bite may feel like a tiny prick and may go unnoticed. At first, there may be little or no visible signs of the bite such as swelling. A red circular mark may appear about 6 hours after the bite. The symptoms may progress to aching sensations, muscle pain at the bite site spreading to the lower back, thighs and limbs. A black widow spider bite can cause intense abdominal pain that can be confused with appendicitis. Symptoms can last 36 hours and lingering effects may last for several weeks.

Treatment

Keep the bite site lower than the level of the victim's heart and clean the wound/bite site with alcohol or a moist aspirin or soap and water. Then apply ice or cold packs to the bitten area to slow the circulation of the venom. Remove rings or constricting items since the bitten area may swell. Never cut or suction a spider bite. Keep the victim quiet and watch for signs of shock. Call your medical provider immediately to determine whether the bite victim can be managed at home or will require treatment by a physician or hospitalization. Several cases may require antivenin treatment.

Africanized Honey Bees (Killer Bees)

The Africanized honey bee looks the same as the European honey bee, but is much more aggressive in defending its hives or colonies and can attack without warning. One or even hundreds of bees target the head in an attack. A single sting is no more powerful or painful than that of the European honey bee, but killer bee victims can be stung hundreds of times. If attacked, cover your head and run in a zigzag pattern and find shelter in a building or car or dark area as quickly as possible. Then quickly remove all stingers from the skin.

European Honey Bees

The European honey bee pollinates crops and flowers. It is about 1 inch long and is colored golden brown with black strips encircling its fuzzy abdomen. A honey bee's venom is just as dangerous as that of a rattlesnake, only there is less toxin involved in a single sting. So it is vital to remove the poison sac as soon as possible. After a sting, the barbed stinger remains in the skin with the venom sac attached. Do not attempt to pull out the stinger with your fingers because as you squeeze, you force more venom into your body. Instead, use a piece of hard plastic (credit card) or fingernail to scrape or flick the stinger out of the skin. Bees are more easily agitated on cloudy days, or by dark or bright clothing, or by vibrations or loud noises. Bees typically attack the head and ankles. 100 - 200 stings can be fatal to an average adult. The venom from a dozen stings can cause rapid onset of swelling, headache, muscle cramps and fever. If you have been stung multiple times or are experiencing any allergic reactions, e.g., swelling in other parts of the body, breathing problems, chest constriction, abdominal cramps or shock, get emergency medical help immediately. If attacked, see above.

Ants

Many ants can sting or bite and use their venom to kill smaller creatures or to keep intruders away. Therefore, the best prevention is to avoid stepping on or sitting on all of their nests. Dust your feet with talcum powder.

Wasps

Wasps are slender with a relatively thin waist and four wings. Smooth and somewhat shiny, wasps have brightly colored "skin," often with sharply contrasting black and yellow patterns. Females can sting multiple times. The males have wings but no stingers. Wasps are predators and feed on insects and spiders. Because its stinger is not barbed, it can be removed and reinserted repeatedly, each time injecting out enough venom to cause considerable pain.

Yellow Jackets

Yellow jackets have jagged bands of yellow and black. The stings are painful and they attack viciously outdoors when their nests are bothered.

Signs and Symptoms of Bee, Ant or Wasp Stings

The severity of an insect sting reaction varies from person to person. A normal reaction will result in pain, swelling and redness around the sting site. A large local reaction includes swelling and redness beyond the sting site. Although frightening in appearance, these large local reactions usually will go away over several days. The most serious reaction to any insect bite or sting is an allergic one. Any of these reactions requires immediate medical attention. Symptoms of a severe allergic reaction or “anaphylaxis” may include one or more of the following:

- ⊗ Redness, hives, itching or swelling in areas other than the sting/bite site.
- ⊗ Tightness in or constriction of the chest and difficulty breathing.
- ⊗ Abdominal cramps.
- ⊗ Hoarse voice or swelling of the tongue.
- ⊗ Dizziness or a sharp drop in blood pressure.
- ⊗ Unconsciousness, shock or cardiac arrest.
- ⊗ **Delayed reactions can also occur.**

This type of reaction can occur within minutes after the sting/bite and may be life-threatening. People who have previously experienced an allergic reaction to an insect sting or bite have a good chance of a similar or worse reaction if stung or bitten again by the same kind of insect. If you have severe allergies to any insect, always carry appropriate medicine prescribed by your physician with you when you go outdoors. To relieve minor stings or itches, apply a paste of baking soda and water, half of a cut onion, apple cider vinegar or meat tenderizer or a moist aspirin to the sting/bite. **Remember that baking soda is alkaline and will neutralize the acidic stings of bees and that vinegar is an acid and will help soothe the alkaline sting of a wasp.**

Treatment

Wash the sting/bite site with soap and water or an antiseptic to help remove some of the venom from the skin's surface. Apply cold compresses to the site to help keep the venom localized. Have the victim rest. Apply freshly chewed or crushed plantain leaves to the site or apply a paste of warm water and powdered bentonite clay or activated charcoal to the site. You can also ingest a few capsules of activated charcoal. Other products that have helped people relieve bee stings are honey, lemon, lime, onion, papaya, vinegar, half an onion, Swedish bitters, cold milk compresses, baking soda pastes, a moist aspirin, essential oil of lavender, vitamin B, fresh aloe, vitamin C paste, witch hazel, meat tenderizer and/or enzyme cleaners or Not Nice to Skin Irritations™ or, in a pinch, a mud pack. Call your health care provider to determine whether the bite can be managed at home or will require medical treatment. If you are bitten or stung and did not see the insect, call your health care provider. From the symptoms you describe, the nurses or doctors will determine if your bite or sting could be poisonous and if you need to be examined by a doctor.

Arizona Brown Spiders (Fiddleback Spiders)

This small brown spider does have the potential to be venomous. Brown spiders are about the size of a half-dollar, including legs, and are distinguished by a violin or “fiddle” marking on the back of the head. This timid arthropod produces an irregular web. It tends to live in the foothills or desert areas that are dry, littered and undisturbed. There it may seek shelter in garages, wood, dead cactus, pack rat nests, storage areas or trash piles. On rare occasions it may be found in bedding or clothing - but again, only in desert-situated settings. If you believe you have been bitten by an Arizona brown spider, try to capture it and bring it with you to the medical facility. Call your health care provider to determine whether the bite victim can be managed at home or will require medical treatment.

Brown Recluse Spiders

The brown recluse spider is shy, sedentary and builds an irregular web that is often not even recognized as a spider web. Females lay eggs in flattened egg sacs that are frequently attached to the underside of objects.

Mating in this species occurs from February to September. Up to 40 spiderlings may hatch from a single egg sac. A single female may produce up to five egg sacs in a summer. Females can live up to four years, males less.

Indoors, the brown recluse can usually be found in infrequently disturbed areas away from light sources, such as behind pictures, beneath or behind furniture, in boxes, in clothing, among stored papers, between the corrugation of boxes, under food sacks and behind old boards leaning against walls.

The natural habitat of the brown recluse includes the underside of rocks, loose bark and crevices in decaying logs (Hite et al. 1966). However, many outdoor hiding areas provided by the activities of man are frequently inhabited by the brown recluse spider. For example, a survey of piles of junk in Kansas, piles of old tires and inner tubes, furniture, old boards and trash were found to be inhabited by the brown recluse. Once the debris/harborage was removed and the natural vegetation returned to the area, the colony was eliminated. There are at least 13 species in the U. S.

Signs of a Brown Recluse Bite (Hobo spider bites are similar but normally less severe.)

Brown Recluse bites are sharp but not initially painful like those of the Black Widow, but a small, white blister is quickly raised, broken, and surrounded by a red welt. An hour or more may pass; then there may be intense pain. The depressed center of this raised, red circle (the size of a dime to a quarter) turns dark within a day. The dead tissue regularly sloughs away, and the bite area scars over in one to eight weeks. Death seldom occurs, but the bite is debilitating and psychologically traumatic. Note: A bite from a brown recluse may also produce an intensely sore lump, even several weeks after the initial injury.

Treatment

Seek medical attention immediately. Keep the bite site lower than the level of the victim's heart and wash the wound with alcohol or a moist aspirin, soap and water. Then apply ice or cold compresses to try to slow the circulation of the venom. Keep the victim quiet and watch for signs of shock. **See a health professional.**

Conenose Bugs (Kissing Bugs)

This slow-moving bug is dark brown to black with yellow/red markings on the abdomen and measures ½ to 1 inch long. Its body is long with 3 pairs of legs and a cone-shaped head. The conenose bug usually bites and feeds on the blood of its victim when the victim is asleep. Seen in the spring and early summer, it makes its home inside rodent and bird nests. During the day it may hide indoors under furniture or in closets. Put down duct tape, sticky side up and held down with (masking) tape, on the edges to trap these pests.

Signs and Symptoms of a Conenose Bug Bite

The bite can be painful with redness, swelling and itching. Each time a bite takes place, the victim becomes more sensitive. Each bite can then cause a serious allergic reaction that causes itching scalp, palms and soles, welts or rash, nausea, vomiting and breathing problems. Anaphylactic reaction can occur in very sensitive people.

Call your health care provider to determine whether the bite victim can be managed at home or will require medical treatment. If possible, capture the bug in order to confirm the bite was that of a conenose bug.

Ticks

If you do not wish to wear any repellent, wear light colored clothing and tuck pants into socks or tape them to the legs tightly. Leave as little skin exposed as possible. If you are in a tick infested area, inspect hourly for ticks, especially between the ankle and the knee. Have someone help you check your entire body at noon and at bedtime after you shower and before you go to bed. Be extremely careful when you inspect the head, back, groin and armpits. Remember: An engorged nymph will only be the size of a poppy seed. Attached ticks can cause a feeling on the skin in the lower extremities of pricking, tingling or creeping. If any ticks are found on you or your pet, don't kill them; cover them with Vaseline, melted wax or fingernail polish. May be they will back out on their own or suffocate. If they don't, take a pair of tweezers, gently pull them out with a slow, steady pressure. Don't twist. Once the tick has been removed, drop it into a plastic pill bottle with alcohol to kill it and then wash

the bite site with soap and water and then apply iodine or another antiseptic. Save the tick and call your doctor for further advice. Wash all clothing in borax and put all other non-washable materials in a clothes dryer - the dryer's temperature will kill all ticks.

Unknown Bites and Stings

If you are bitten or stung and did not see the insect or creature, wash the area with soap and water or a moist aspirin or apple cider vinegar or an antiseptic and call your health care provider immediately, especially if you experience any discomfort. From the symptoms you describe, the nurse or doctor can normally determine if your bite or sting could be poisonous or serious and if you need to be personally examined by a doctor.

Treatment of Minor Animal Bites

- Wash the bite with soap and water to remove saliva and any other contamination.
- Tincture of calendula or echinacea can be diluted 5 to 1 with warm water to disinfect the site.
- Essential oil of tea tree or lavender can be added at a rate of 6 - 8 drops per cup of warm water or put a drop right on the wound or bandage. Oils get into the blood stream quickly.
- Open the wound and pour in some 3% hydrogen peroxide until it foams up.
- Plantain leaves can be chewed or crushed into a slippery mass and then applied to minor bites and wounds. Apply ice and elevate the area if there is any swelling; to stop bleeding elevate the area above the heart level and cover the entire wound with a clean cloth and press it firmly against the wound.
- Call and/or see your medical care provider as soon as possible.

Note: if you are not sensitive, a dropper full of tincture of echinacea can also be given internally every hour for three hours for minor animal bites. Before treatment with any material, be sure you are not sensitive to it.

BLOOD FEEDING ARTHROPODS GENERAL DESCRIPTION

Blood feeding arthropod pests are of great concern not only because of their annoying and often painful bites, but more importantly because many can also be vectors (carriers) of pathogenic (disease) organisms, that seriously injure or kill humans and domestic animals, e.g., encephalitis, tularemia, Lyme disease, malaria, yellow fever, Chaga's disease, bubonic plague, murine typhus, tapeworms, Rocky Mountain fever, etc. Specific identification is particularly critical in these dangerous pests because members of each group are very similar in appearance, but differ in their choice of hosts, habits and potential as disease vectors.

Every blood feeder needs a blood meal at some point to complete its life cycle. The only exception are some of the males of this group, e.g., male mosquitoes, male horse flies, etc., who don't need blood. Some blood feeders will feed on only one host species. However, most blood feeders have not only a preferred host, but also will feed on a wide range of substitute hosts. When multiple host species are involved, there is a greater possibility of disease transmission, e.g., the malarial parasite, yellow fever virus, rickettsiae of Rocky Mountain spotted fever, the bubonic plague bacillus, etc. Many wild animals can serve as reservoirs of disease organisms and still suffer only a few or no ill effects themselves, e.g., roof rats are reservoirs for human plague and typhus with fleas serving as the vectors of these diseases. Some of these blood feeders remind us we are not always on the top of every food chain.

1. **First, properly locate and identify** the blood-feeding pest(s) involved.
2. **Second, practice exclusion and prevention.** This consists of denying access into the structure of the hosts and the insects themselves. Access to any crawl spaces or attics must be denied so wild animals such as opossums, feral cats and dogs, skunks, birds, bats, commensal rodents, squirrels and raccoons cannot enter. Exclusion consists of reducing openings into the building so that wild animals and/or insects cannot gain entrance. This is done by carefully plugging or sealing holes with concrete, caulk or other appropriate material; carefully screening windows, doors and vents; reducing door threshold gaps, installing doorsweeps, installing negative ion plates, spraying Safe Solutions, Inc. enzyme cleaners, mopping with borax, etc.
3. **Indoor control and sanitation.** Mechanically reduce pests by vacuuming or steam cleaning or rinse-and-vacuuming all rugs, floors and fabric-covered furniture along with routine cleaning or properly disposing of

all infested pet bedding. Remove and clean up all harborage debris; vacuum or steam all insects, spiders and/or mites; remove all rodent nests; caulk all cracks and crevices; vent and cover all crawls; routinely and thoroughly clean with Safe Solutions Enzyme Cleaner with or without Peppermint and/or borax.

4. **Outdoor control.** Begin with sanitation, e.g., debris removal; keep the grass and weeds mowed; trim all branches that touch or overhang the building; remove all old bird nests from the structure, and eliminate any alternate hosts and their harborage within 100 yards of the structure. Sanitation is followed by the application of diluted Safe Solutions, Inc. ((protease) enzyme cleaners with or without peppermint or other Pestisafes®, e.g., talcum powder, food-grade diatomaceous earth (DE), peppermint soap, Vaseline, freshly ground pepper, menthol rub and/or Tide® soap. Application may range from spot application along the exterior foundation wall and adjacent perimeter band treatment to whole yard treatment depending on the **imminent** danger to humans. Wettable powder and microencapsulated pesticide formulations can be effective, **if absolutely necessary** but, as in the case of **all** volatile, synthetic pesticide poisons, there is an obvious risk of contamination of wells, air, pets and people whenever they are used. Be sure there is **no** other alternative and **all** Pestisafes® have been tried first!
5. The best treatment for insect bites and stings is to avoid them in the first place. If practical, wear 2 layers of clothing, avoid floral prints, hair spray, perfumes and shiny jewelry. The color blue is the preferred color of mosquitoes; wear white, tan and/or light green clothing. Routinely shower with peppermint soap. Try orally taking 3 - 4 garlic capsules and Vitamin B and nutritional yeast daily. Avoid eating sugars, alcohol, tropical fruits and juices. Thread a sprig of elder through your hair. To create a mosquito-free environment, boil willow in water, burn artemisia in a campfire or diffuse various combinations of the oils of citronella, eucalyptus, pennyroyal, grape seed, almond, lavender, rosemary, tea tree, basil, geranium and/or sage into the areas. You can also make a room spray with water and a few drops of these essential oils or with enzymes. Essential oils, e.g., geraniol or geranium oil and coconut oil, diluted in olive oil or aloe vera nectar or jojoba can be applied topically to pulse points on your body every hour or so to repel insects (e.g., fire ants, ticks, fleas, mosquitoes, lice and gnats), but can be irritating to some people, **so always test them on a small area of your skin first!** As the odor lessens, so does the effectiveness. Try chamomile tea, thyme, sweet basil, yarrow, vanilla extract or try dilutions of camphor, tea tree, bergamot, patchouli, sandalwood, peppermint oil, Guatemalan lemon grass, lavender, cedar wood and pennyroyal (*Mentha pulegium*) individually or as blends. Pennyroyal's Latin name means mint and flea and the plant and smoke from its burning leaves help control these pests, but avoid mint plants if you are pregnant or sensitive. Other essential oils that can be made and used as repellents include menthol, citronella, eucalyptus, geranium and okra but they can stain clothing; do not drink them and be careful around your eyes and mouth when applying them. **See Natural Plant Caution, Chapter 19, Fleas.**
6. If bitten, leave the immediate, and if the bite is considered serious, go to a physician immediately, but first remove the stinger and cleanse the area as soon as possible. If you are not sensitive, you can ingest homeopathic *Apis mellifica* and rub an apis-based cream or a little epsom salt water or enzyme cleaner on the wound every 15 minutes until relief arrives. You can also apply echinacea tincture to the sting area and take it internally to help reduce allergic reactions and other immunological disturbances. If the bite/sting feels better when cold is applied or the area is already cold and/or numb, use homeopathic ledum. Ice alleviates pain and swelling and mud or clay, fresh garlic, onion juice, witch hazel, baking soda or meat tenderizer paste eases itching and aching. (Baking soda is an alkali that neutralizes acid. Applied to the skin it acts to reduce pain and swelling, draws out toxins and helps neutralize some of the inflammatory agents in the toxins.) Meat tenderizer is made from papain, an enzyme derived from papaya and helps break down the inflammatory properties of venom. (That is why protease enzyme cleaners and shampoos also work.) Various herbs rubbed into insect bites may also accelerate healing: ground-up comfrey, sweet basil, tea tree oil (a powerful wound healer and germicide), olive oil, marigold, yellow dock, wild marjoram, leek bulbs, crushed parsley or plantain and/or the leaves of rue, St. John's wort, plantain, house leek, aloe and pennyroyal. Apply calendula petals on a bee sting. Wasp stings are best treated with any wild mallow flower or freshly chewed or crushed plantain leaves, slices of onion or garlic or vinegar applied topically, accompanied by an internal dose of homeopathic vespa. Taking vitamin C and panthothenic acid over a period of 3 - 4 hours helps create a natural antihistamine effect, thus reducing swelling. The enzymes bromelain and quercetin also help reduce inflammation. If you are upset try taking a calming flower remedy under the tongue every 10 minutes until you settle down. If you are allergic to bee stings, get medical attention immediately. Spray the site with Not Nice to Skin Irritations. Your own urine on a cloth has antibodies that can neutralize an insect's venom. Apply pulped or crushed leaves of wormwood, rue or sage to alleviate the pain of scorpions, spiders or jellyfish, but some people may be sensitive, especially to wormwood or rue. Increase your intake of vitamin C and

you receive antiinflammatory effects and boost your liver's ability to filter out the toxins. Take chlorophyll supplements to boost your immune system and help detoxify your blood. Take shiitake or reishi mushroom supplements to help you detoxify. **Try spraying a mix of 1000 mg. of vitamin C in a cup of warm water (a 1% - 3% solution) or diluted Safe Solutions Enzyme Cleaners from a small "spritzer" bottle on the bite/sting as a sting reliever.**

7. Bend the arm and note where it forms a crease at the elbow. Put your thumb at the point at the end of the crease, away from the body and press slowly into the joint. This accupressure point helps alleviate the redness and swelling of bites and stings.
8. Remember, the emotional reaction to a sting or bite is often more severe than the actual hazard from the venom.

One of the best natural or botanical pesticides for controlling bloodfeeding arthropods and other pests is Neem. **What is Neem?** Neem, a member of the *Meliaceae* family and a botanical cousin of mahogany, is a tall, fast-growing, evergreen tree which has an attractive crown of deep-green leaves and masses of honey-scented flowers and thrives even in nutrient-poor, dry soil. It tolerates high temperatures, low rainfall, long spells of drought and salinity, and can be propagated by seed. Because of its many benefits, neem has been worshipped as a goddess in India. Neem is bitter in taste. The bitterness is due to the presence of an array of complex compounds called "triterpenes" or more specifically "limonoids". The most important bioactive principle is a terpenoid known as azadirachtin; however, at least 10 other neem limonoids also possess insect growth regulating activity. The tree's scientific name is *Azadiractita indica*. Neem has been used for centuries primarily against household and storage pests, and to a limited extent against crop pests. Neem trees were the only green thing left standing during a ravaging locust plague in Sudan in 1959. Neem does not kill pests but affects their behavior and physiology and reduces the risk of exposing the pests' natural enemies to poisoned food sources or starvation. Neem derivatives affect more than 200 insect species belonging to *Coleoptera*, *Diptera*, *Heteroptera*, *Homoptera*, *Hymenoptera*, *Lepidoptera*, *Orthoptera*, *Thysanoptera*, several species of mites and nematodes, and even noxious snails and fungi. Although neem oil can be used directly for pest control, semi-purified "bitters" and "neem rich" fractions can easily be standardized for biological properties and could satisfy even stringent quality requirements. Being water soluble, they also can be applied as systemic compounds which render them more photostable and nonphytotoxic. A garlic odor often present in other neem products is absent in "bitters". Neem products are effective and relatively hazard-free. An added benefit of using semi-purified neem fractions, rather than pure compounds, is that pests will be less likely to develop resistance. Neem compounds act together on several different behavioral and physiological processes which also helps prevent insects from evolving resistance to the compound. Their effects include repellence, feeding deterrence, reduced ingestion and digestion of food, poor growth and development, reduced longevity and fecundity, mating disruption, oviposition deterrence, inhibition of egg hatchability, molting failures and direct toxicity. Reports suggest that by paralyzing the muscles in the insects' mandibles neem induces starvation. At lower than lethal doses, azadirachtin also mimics juvenile hormone, preventing insects from maturing. Neem-based insecticides can be further fortified against dynamic pests by optimizing their use with microbials or other botanicals. Neem fruits, seeds, oil, leaves, bark and roots can be used as general antiseptics, antimicrobials for the treatment of urinary disorders, diarrhea, fever, bronchitis, skin diseases, septic sores, infected burns, hypertension and inflammatory diseases. Neem oil and its isolates - nimbidin, nimbidol and nimbin - inhibit fungal growth on humans and animals. Neem leaf extracts and teas are used to treat malaria; iquin tablets and injections containing neem extract are currently being formulated for treating chronic malaria. Exposing kissing bugs (*Rhodnius prolixus*), the major vector of Chagas disease in Latin America, to neem extracts or to azadirachtin "immunizes" them against their internal protozoan parasite *Trypanosoma cruzi*. We are trying it and enzymes on termites. Cattle leaf supplements containing neem leaf powder are used as worm killers. Creams containing neem oil are used for animal wound dressing and also act as fly and mosquito repellents. Neem oil in human bathing and laundry soap kills lice and neem in dog soaps and shampoos controls ticks and fleas. Neem twigs are used daily by millions in Bangladesh, India and Pakistan as disposable toothbrushes; extracts of neem bark are used in some toothpastes and mouthwashes. Neem plantings also serve as a refuge for honeybees, wasps, spiders, birds, bats and other beneficial organisms, and the litter of falling leaves can improve soil fertility. Neem overall as a relatively safe, natural (botanical) pesticide poison with numerous benefits. Neem nectar does not kill pollinating bees.

Noxema® - We have found that Noxema® or Ben-Gay® applied to the exposed skin of children and people repels mosquitoes and other pests. (Always check to see if you are sensitive before using any product.)

Invincible Herbal Insect Repellent from Great Garden Formulas by Joan Benjamin and Deborah L.

Martin: "...before heading outdoors, I douse myself with an incredible repellent that my friend Marion Spear and I concocted, Tina Wilcox, head gardener at the Ozark Folk Center in Mountain View, Arkansas says. "It renders me almost invincible to both insects and poison ivy!"

Ingredients and Supplies:

- 1 large handful fresh jewelweed (*Impatiens capensis*)
- 1 large glass jar with plastic lid (vinegar corrodes metal)
- 1 strainer
- 1 quart apple cider vinegar
- ½ teaspoon pennyroyal oil
- 1 teaspoon eucalyptus oil
- 1 teaspoon orange oil
- 1 teaspoon citronella oil
- 1 plastic spray bottle

Directions:

1. Crush jewelweed in the jar and cover with vinegar.
2. Let steep for several days.
3. Strain out the jewelweed and mix essential oils into the vinegar.
4. Before applying all over, spray a small amount on the inside of your arm and monitor for 15 minutes for any allergic reaction.
5. To use, spray thoroughly on clothing and lightly on any exposed skin except your face. Reapply every ½ hour or so. (To keep insects away from your face, spray your hat or bandanna.)

Yield: About 1 quart of invincible spray. Note: This formula will keep indefinitely. **Caution: If you are pregnant, don't use pennyroyal, even topically, as it may increase the risk of miscarriage.**

How toxic are the venoms of stinging ants, bees and wasps? As Justin Schmidt noted: The sting of a tiny fire ant, which weights in at about three billionth of an ounce, can have a terrific impact on a huge person that weights about 10 million times as much as the ant. About 70,000 species of Hymenoptera (ants, bees, wasps, etc.) can sting. The Author likes to note only the females can sting you. We are all different and unique so we may only experience a little pain, or we may experience extreme pain and allergic reaction. **Avoid being stung if at all possible!**

How many Texans have felt the "sting" of fire ants? A Winter 2000 poll conducted 2/9-25/00 by the Scripps Howard Data Center noted 79% of all polled Texans had been stung by fire ants and a majority of the residents had been treated for them in the past year. West Texans were least likely to have been stung (61%) as opposed to Central Texans (90%). Eastern Texans had been stung 89%, Southern Texans were stung 78% and 72% of Northern Texans that were polled noted they had been stung by fire ants. Of the Texans over 60 years old that were stung, 68% were treated, as compared to 37% of the 18 to 29 year olds that were stung by fire ants. Among those treated for fire ant stings, 51% were treated 4 or more times. The margin for error for the whole sample is + or - 3 percentage points, and slightly larger for the subgroups. **I would like to add the best repellent for fire ants I have found is baby powder with talcum. No matter how much volatile pesticide poison "they" spray, the spray ants continually are increasing in numbers and in infested territory!**

Never approach bees during a thunderstorm. The electricity in the air makes them more aggressive.

There are over 700 species of venomous arthropods with those in the order Hymenoptera (ants, wasps, hornets and bees) accounting for the greatest percentage of deaths, usually from an allergic reaction. Usually the only result is an unpleasant experience; even so, BEE CAREFUL! **If you feel an insect crawling on you, it should be brushed away and not crushed, slapped or pinched.** Remember to use mosquito netting, talcum powder, double-sided tape, duct tape (sticky side up), glueboards, Vaseline (petroluem jelly), food-grade DE, screens, caulk and vacuums; the best control is to avoid and/or exclude them.

Vaseline - smeared lightly over all exposed skin will protect most people from mosquitoes and black flies.

DEET Caution: DEET in low concentrations is an excellent mosquito **attractant**. The University of Florida was issued three patents in 1989 utilizing DEET in low concentrations as an attractant in insect traps. The public should be warned that they must thoroughly wash all DEET residues off their clothing, children, pets and themselves or continually reapply more and more DEET for as long as they remain in a mosquito infested area - before their DEET application volatilizes enough to become an attractant.

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2230775&dopt=Abstract

Every year, approximately one-third of Americans use insect repellents containing the insecticide DEET. Duke University Medical Center pharmacologist Mohamed Abou-Donia has found that prolonged exposure to DEET can impair functioning in parts of the brain.

<http://dukemednews.duke.edu/av/medminute.php?id=5638>

DEET has been proven to enter the bloodstream through application to the skin, and can cause side-effects ranging from rashes and hives to uncontrollable twitching and muscle spasms to death.

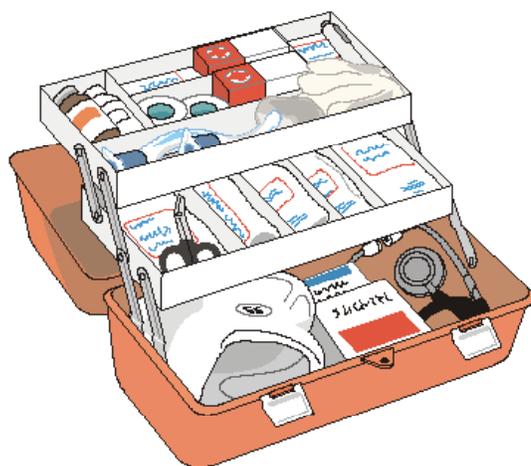
<http://www.quantumhealth.com/news/articledeet.html>

CAUTION: Remember, people may be allergic to numerous things, e.g., aspirin, zinc, thiamine chloride, milk and/or peanuts, so always treat a small area before using any product, herb, soap cleaner or material on your body. When in doubt, always see your health care professional!

The new Insect Repellent from Safe Solutions, Inc. is a wonderful alternative to DEET. Its Not Nice to Skin Irritations and/or bentonite clay helps reduce the pain of various bites and/or stings.

NOTE: Safe Solutions, Inc. Bentonite Clay Pastes, Not Nice to Lice® and Not Nice to Fleas® and Lice R Gone® shampoos and/or Safe Solutions, Inc. protease enzyme cleaners help relieve itching and irritations caused by poison ivy and/or insect bites and stings.

BE SURE TO READ THE APPROPRIATE SECTION FOR FURTHER COMMENTS, TREATMENTS AND/OR CONTROLS FOR SPECIFIC PESTS.



BEE CAREFUL!