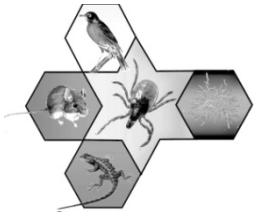


NSF- EID: Lyme Disease Gradient Project

Safety Manual

Purpose: This document is to serve as a general guide for possible biological and environmental safety issues that may arise when participating in this project. It is not an all inclusive document to replace first aid training or hands on training.

June 17, 2006

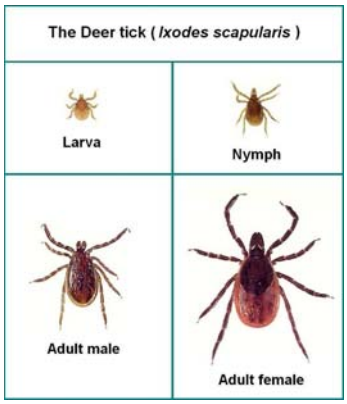
Avoiding Lyme disease and other tick-borne infections

Ticks do not jump, fly, or drop from trees, but grasp passing hosts from various sources such as the leaf litter and tips of grass. Ticks are usually picked up on the lower legs and then crawl up the body seeking a place to feed.

What is Lyme Disease?
Lyme disease is caused by a bacterial infection (*Borrelia burgdorferi*), which can be transmitted to humans by the bite of *Ixodes scapularis,* the blacklegged tick, also known as the deer tick in the Eastern U.S.

Know the Symptoms!
While some people show no reaction to Lyme disease, others are seriously affected by it. About 70% of infected people develop a rash called *erythema migrans* (EM) a few days to weeks after the bite. This rash usually resembles a reddish "bull's-eye" or an expanding red ring and is often accompanied by flu-like symptoms. These early symptoms generally subside on their own, but untreated patients can later develop more serious health complications. However, it can be easily treated with antibiotics.

Common Signs of Infection:
- "Bull's- eye" rash
- Flu-like Symptoms
- Headaches
- Stiff Neck and/ or Joints
- Fever
- Muscle Aches
- Numbness/ Tingling
- Loss of Concentration



How to Avoid Tick Bites:
- Personal Protective Clothing:
  - Wear light colored clothes to easily spot ticks or PPE such as Tyvek suits
  - Wear long sleeved shirts and closed toed shoes
  - Tuck your shirt into your pants and your pants into your socks.
- Apply bug repellent on your clothes. DEET, picaridin, and permethrin are good options. Carefully follow directions on label. CDC recommends products containing 30-50% DEET.
- Thoroughly inspect your head and body when you get back from the field!

What To Do if Bitten:
- DO NOT squeeze the body of the tick! Grasp it as near to your skin as you can with fine tweezers or tick remover, and GENTLY pull it out.
- Clean the bite with soap and water; and sterilize the area using rubbing alcohol or hydrogen peroxide.
- If you accidentally break off the mouthparts, seek medical attention to remove them to avoid infection.
- SAVE THE TICK. This is important to identification which tick-borne pathogens you were possibly exposed to. Either, place the tick in your freezer or in a vial of 70% alcohol. Always include information like where and when the tick may have been acquired and when it was removed.

For an excellent guide to common tick identification, please visit:
http://tickencounter.org/education/tick_identification/

Other Tick-borne Diseases:

Rocky Mountain spotted fever (RMSF) (caused by *Rickettsia rickettsii).*
Vector Ticks: American dog tick and Rocky Mountain wood tick.
Symptoms: Usually 2 to 14 days: fever, spotted rash, nausea, vomiting, severe headache, abdominal pain, joint pain, diarrhea, muscle pain and lack of appetite.
Babesiosis (caused by *Babesia microti*)

Vector ticks: Deer ticks and possibly other related Ixodid ticks.
Symptoms: Malaria-like illness normally begins about a week after a tick bite with a gradual onset of malaise, anorexia and fatigue. This is followed several days later by high fever, drenching sweats, muscle pain and headaches. As with malaria, these symptoms can continue over a protracted period or can abate, then recur.

Ehrichiosis, Anaplasmosis (caused by rickettsial bacteria)
Nonspecific symptoms include fever, headache, nausea, vomiting, and malaise. Most cases occur April through October.

Tick-borne diseases are easily treatable if caught early so check for ticks daily and use preventative practices!

For more information on these and other **tick-borne diseases and prevention measures** visit:
http://www.aldf.com/majorTick.shtml
http://www.cdc.gov/ticks/diseases/
http://www.tickencounter.org/
http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-2/protection-against-mosquitoes-ticks-insects-arthropods.aspx

Biting and Stinging Insects

Preparing for the Field:
Before venturing outdoors, anyone who is allergic to insect stings or bites should inform their supervisor and coworkers about their condition and the possible danger if they were to be stung.

It's important to distinguish an allergic reaction from the normal reaction to insect stings and bites. Swelling, redness, and itching around the sting or bite are normal. Itching and hives far from the sting or bite are signs of an allergic reaction.

Biting Insects:

Midges: Also known as "no-see-ums" and "punkies", biting Midges are so small that they can pass through ordinary mosquito netting. Bites cause a burning sensation, and subsequent welts can itch for days.

Deer and Horse Flies: Most prefer warm seasons and the warmth of the day, but some species are most active at dawn or dusk. Females bite which can be deep and painful, but unless one is allergic the effects will soon pass.

Black Flies: Spring and early summer, swarms of small female black flies bite mostly during the day, particularly early morning and toward evening and mostly near rivers or streams. Threatening weather, as before a thunderstorm, intensifies biting.

Chiggers: Chiggers are the larval stage of a mite. They do not burrow into skin but rather inject saliva into the wound which causes an allergic reaction and an

intensely itchy area and dermatitis. Chigger mites are very small (0.2-0.4 mm ~ 1/100") and not easily seen.

Mosquitoes: Most species are active in the early morning and dusk hours. Mosquito bites affect each person differently and can result in no reaction to severe swelling and itching. Only female mosquitoes bite. The **West Nile virus (WNV)** is most often spread to humans from the bite of an infected mosquito. Most human infections with WNV (about 80%) cause no symptoms, and about 20% cause flu-like symptoms, including fever, fatigue, headache, and muscle or joint pain. Fewer than 1% of humans infected with WNV become severely ill. Severe symptoms include high fever, stiff neck, disorientation, tremors, muscle weakness, and paralysis. Severely affected persons may develop encephalitis (inflammation of the brain) or meningitis (inflammation of the membranes of the brain or spinal cord). Severe cases may be fatal. People of all ages and conditions may be affected. However, those who are above age 50 or who have had an organ transplant are at increased risk of severe illness.

Protecting yourself from biting insects:

- Use insect repellent if you work outdoors with areas of biting insects. DEET and non-DEET repellents work. Use as directed.
- Use permethrin on clothing only.
- Use protective clothing if you work outdoors, including long-sleeved shirts, long pants, and socks.
- If necessary, bug-jackets, head-nets, gloves, and Tyvek suits can be used to avoid biting insects.
- Wash skin treated with insect repellent with soap and water after returning indoors.

Stinging Insects

Recognizing Stinging Insects:
The insects that are most likely to trigger an allergic reaction are:

1. **Wasps** (such as yellow jackets and bald-faced hornets) have a straight stinger that they can use again and again.
2. **Honey bee workers** have barbed stingers that become embedded in the skin, preventing them from stinging more than once. Other bees (e.g., bumble bees, sweat bees) have straight stingers and can sting multiple times.
3. **Fire ants** can pivot as they sting, leaving a circular cluster of stings.

If you're attacked by a swarm of stinging insects, move away quickly! Insects are probably protecting their nest and view you as an intruder. The longer you stay, the more likely you are to be stung. Pull your shirt or jacket over your head to protect your face and airways. Keep moving until the insects stop chasing you or you reach a safe area, such as a vehicle or building. Check for stings and remove any venom sacs and stingers. Monitor yourself for signs of an allergic reaction and seek medical attention if necessary.

The color and size of individual insects may vary widely; when possible bring the insect with you for identification if you're seeking treatment.

Some tips to avoid stinging insects include:

- Avoid wearing brightly colored clothes or perfumes, lotions, or other scented products that may attract insects.

- Be alert for insects when you are eating, drinking, or cooking; the scent of food attracts insects.
- Wear pants that seal at the ankle and shirts that seal at the wrist to prevent insects from getting inside your clothing.
- Do not swat or crush insects; when some insects are injured, they send chemical signals that incite other insects to attack.

General Treatment for Insect Stings and Bites:

- If you've been stung by a bee, look for the barbed stinger and venom sac that may be embedded in your skin. The stinger will look like a little black dot in the center of the wound. Do not use your fingers or tweezers to remove it. Doing so might pinch the venom sac, forcing venom into the wound. It's best to remove the venom sac and stinger by scraping the area with a straight-edged object, such as a credit card or driver's license. If you've been attacked by fire ants, brush them off and take off any rings and tight-fitting jewelry.
- Wash the area of the sting or bite with soap and water or with an antiseptic wipe.
- Elevate the affected area and use ice or a cold compress to reduce swelling and pain.
- If needed, apply a topical steroid ointment or take an over-the-counter oral antihistamine, such as Benadryl or Chlor-Trimeton to help reduce swelling, itching, and redness. An anesthetic spray containing benzocaine, such as Solarcaine, may provide some pain relief. Hydrocortisone cream or calamine lotion applied to the skin may help relieve itching and swelling. Be sure to follow all labels and instructions on the medications. If you've been stung by fire ants, do not break the pustules.

Anaphylaxis

Anaphylaxis is a serious and potentially life-threatening medical situation that requires immediate emergency treatment. Someone with allergies usually will begin to show signs of a reaction within 1 to 15 minutes after an insect sting or bite. Sometimes a reaction may not begin for up to 4 hours.

The normal reactions to a sting or bite include pain, swelling, and redness around the bite. Stings or bites near the mouth or nose may cause swelling that interferes with breathing, even in individuals who are not suffering an allergic reaction.

Allergic reactions can vary from mild to severe and from individual to individual.

- Itching and hives far from the bite
- Red, itchy, watery eyes
- Swelling of the throat or tongue/difficulty swallowing
- Difficulty breathing
- Dizziness
- Severe headache
- Stomach cramps
- Diarrhea
- Nausea
- A sharp drop in blood pressure
- Loss of consciousness or shock
- Anxiety, feeling of "impending doom"

If You're Allergic to Insect Stings or Bites:

If you've been stung or bitten and know you are allergic, seek immediate medical treatment.

- Speak to your physician ahead of time. He/she can offer suggestions and possibly provide medications or kits that can be taken to the field for use in case of a severe reaction.
- Make sure your coworkers know that you've been stung or bitten and that you may suffer an allergic reaction.
- Have your coworkers contact emergency services or your dispatch center immediately to make them aware of the potentially life-threatening situation.
- If you have been prescribed epinephrine by your doctor, administer the proper dose. Antihistamines may provide some relief, but they are no substitute for epinephrine.

- Remain calm; anxiety increases blood flow and can worsen the situation.
- Take steps to prevent shock. Lie flat with your feet about 12 inches above your head. You may need a blanket or coat to keep warm.
- Go to an emergency room in case additional treatment is necessary, especially if you've administered epinephrine to yourself.

For more comprehensive information about **biting and stinging insects and WNV** see:
http://www.cdc.gov/westnile
http://www.cdc.gov/niosh/docs/2005-155/
http://edis.ifas.ufl.edu/topic_biting_flies
http://bitinginsects.siteideas.net
http://www.epipen.com
http://www.fhwa.dot.gov/environment/fspubs/08672331/index.htm

Poison ivy, oak, and sumac

Poison ivy, poison oak, and poison sumac release an oil, urushiol, when the leaf or other plant parts are bruised, damaged, or burned. When the oil gets on the skin an allergic reaction, referred to as *contact dermatitis*, occurs in most exposed people as an itchy red rash with bumps or blisters.

The old saying "*Leaves of three, Let it be!*" is a helpful reminder for identifying poison ivy and oak, but not poison sumac which usually has clusters of 7-13 leaves. Even poison ivy and poison oak may have more than three leaves and their form may vary greatly depending upon the exact species encountered, the local environment, and the season. Being able to identify local varieties of these poisonous plants throughout the seasons and differentiating them from common nonpoisonous look-a-likes are the major keys to avoiding exposure.

Poison Ivy

- Eastern poison ivy is typically a hairy, ropelike vine with three shiny green (or red in the fall) leaves budding from one small stem.
- Western poison ivy is typically a low shrub with three leaves that does not form a climbing vine.
- May have yellow or green flowers and white to green-yellow or amber berries.

Poison Oak

- Typically a shrub with leaves of three, similar to poison ivy.
- Pacific poison oak may be vine-like.
- May have yellow or green flowers and clusters of green-yellow or white berries.

Poison Sumac

- Woody shrub that has stems that contain 7-13 leaves arranged in pairs.
- May have glossy, pale yellow, or cream-colored berries.

Tips to avoid Poison Ivy:

1. *Learn to identify poison* ivy, poison oak, and poison sumac, and when you see them, avoid them.
2. *Wear long pants, long-sleeve shirts, socks, and fully*-enclosed footwear when walking in poison-ivy infested areas.
3. *Wear gloves* when working where poison ivy may be present.
4. *Apply a barrier cream* (Ivy Block or Stokoguard), if you know you have a good chance of exposure to poison ivy. (While no vaccine or medicine has been shown to prevent reactions to poison ivy, barrier creams containing bentoquatam seem to be effective in slowing the absorption of urushiol into the skin. Apply the cream as directed, usually about an hour before potential exposure, and thoroughly wash it off within four hours, reapplying as necessary).
5. *Exercise caution not to touch your face or eyes* (or other exposed skin) with hands or gloves that may have come in contact with poison ivy.
6. *Beware of latent resin*. Urushiol resin can remain active for a long time! Thoroughly wash or dispose of clothes, tools, or other objects which may have come into contact with poison ivy. To wash objects, use hot, soapy water and let the clothing or object dry outside for several days.
7. *Wash exposed skin immediately*. It takes about 10-30 minutes after contact for urushiol to bind with skin, so fast cleaning may prevent a reaction. If you think your skin may have been exposed to poison ivy, clean the affected area with rubbing alcohol, and then wash it with cool water. Commercially-available products (e.g., Tecnu soap) can be used to wash urushiol from exposed skin and to minimize the likelihood of a reaction.

Tips to treat poison ivy:

1. *Clean your skin immediately*. If you do this within 10 minutes, you may be able to get the urushiol off before it penetrates your skin. Clean the skin with rubbing alcohol first, then rinse thoroughly with cold water. However, the alcohol will make your skin extra sensitive to urushiol-containing plants that day.
    a. *Don't scrub or use hot water on your skin*. This can draw the urushiol deeper into your pores.
    b. *Don't use regular soap until after you've rinsed off your skin with just water or with another product to remove the urushiol*. Soap can pick up the urushiol and

move it around to other parts of your body. Considering purchasing Technu for people highly sensitive to poison ivy.

c. *Don't forget to clean under your fingernails*; you may have scratched off some urushiol and could redeposit it on other objects or areas of your skin by accident.
d. *There are products designed to break down urushiol* and help with removing it from skin; because it is an oily sap, it can be difficult to remove.

2. *Recognize the symptoms.* An allergic reaction may follow within 48 hours. First, your skin gets red and itchy. Then a rash follows, usually in a pattern of streaks of patches. Eventually the rash turns into red bumps or large oozing blisters. The rash will appear wherever you came in contact with urushiol, although it may take longer for the rash to appear on parts of your body where your skin is thicker. It doesn't spread, however, because there's no urushiol in the blisters. Once the urushiol is gone, the rash will go away.
3. *Stop scratching.* Even though the rash is not contagious, it's best to avoid damaging the skin, or else you run the risk of getting an infection.
4. *Wash clothes and anything else that may have come in contact with it.*
5. *Cool off.* Apply cold compresses, and/or massage the affected area with an ice cube. The cooling sensation will provide temporary relief.
6. *Dry off.* Always let the area air dry--this reduces the itching and oozing of blisters.
7. *Use antihistamines.* They can be taken orally or applied topically, or both. Unfortunately, these types of products only treat the symptom--which is the rash. That's why they should be used after you have used a product to remove the urushiol. Calamine lotion can ease the itching and soothe blistered skin. Apply regularly and liberally.

More reading can be found at:
http://www.cdc.gov/niosh/topics/plants/
http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM143611.pdf

Hypothermia

Hypothermia is dangerously low body temperature, below 95 °F (35 °C). Hypothermia occurs when more heat is lost than the body can generate. It is usually caused by extended exposure to the cold.

Common causes:

- Being outside without enough protective clothing in winter.
- Wearing wet clothing in windy or cold weather.
- Heavy exertion, not drinking enough fluids, or not eating enough in cold weather.

As people develop hypothermia, their abilities to think and move are often lost slowly. In fact, they may even be unaware that they need emergency treatment.

Symptoms:

- Drowsiness
- Weakness and loss of coordination
- Pale and cold skin
- Confusion
- Uncontrollable shivering (although at extremely low body temperatures, shivering may stop)
- Slowed breathing or heart rate

Prevention:

1. Wear proper clothing in cold temperatures to protect your body. These include:

   a. Mittens (better than gloves).
   b. Wind-proof, water-resistant, many-layered clothing.
   c. Two pairs of socks (avoid cotton, wool is best).
   d. Scarf and hat that cover the ears (to avoid major heat loss through the top of your head).
2. Avoid: Extremely cold temperature, especially with high winds and wet cloths.
3. Poor circulation; tight clothing or boots, cramped positions, fatigue.

Before you spend time outside in the cold, do NOT drink alcohol or smoke. Drink plenty of fluids and get adequate food and rest.

Treatment:

- If any symptoms of hypothermia are present, especially confusion or changes in mental status, immediately call 911.
- If the person is unconscious, check airway, breathing, and circulation. If necessary, begin rescue breathing or CPR. If the victim is breathing fewer than 6 breaths per minute, begin rescue breathing.
- Take the person inside to room temperature and cover him or her with warm blankets. If going indoors is not possible, get the person out of the wind and use a blanket to provide insulation from the cold ground. Cover the person's head and neck to help retain body heat.
- Once inside, remove any wet or constricting clothes and replace them with dry clothing.
- Warm the person. If necessary, use your own body heat to aid the warming. Apply warm compresses to the neck, chest wall, and groin. If the person is alert and can easily swallow, give warm, sweetened, nonalcoholic fluids to aid the warming.
- Stay with the person until medical help arrives.

More information on Hypothermia can be found at:
http://health.nytimes.com/health/guides/injury/hypothermia/overview.html

Hot Weather Health Emergencies

Heat Stroke: Heat stroke occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

Warning signs of heat stroke vary but may include the following:

- An extremely high body temperature (above 103°F, orally)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness

Treatment:

1. Move to a shady area.
2. Cool the person rapidly using whatever methods you can.
3. Monitor body temperature, and continue cooling efforts until the body temperature drops to 101-102°F.
4. If emergency medical personnel are delayed, call the hospital emergency room for further instructions.

5. Do not give the victim fluids to drink.
6. Get medical assistance as soon as possible.

Heat Exhaustion: Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat.

Warning signs of heat exhaustion:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting

Treatment:

1. Cool, nonalcoholic beverages
2. Rest
3. Cool shower, bath, or sponge bath
4. If available move to an air-conditioned environment
5. Lightweight clothing

Heat Cramps: Heat cramps usually affect people who sweat a lot during strenuous activity. Heat cramps are muscle pains or spasms—usually in the abdomen, arms, or legs—that may occur in association with strenuous activity.

Treatment:

1. Stop activity, and sit quietly in a cool place.
2. Drink clear juice or a sports beverage.
3. Do not return to strenuous activity for a few hours after the cramps subside, because further exertion may lead to heat exhaustion or heat stroke.

Sunburn: Although the discomfort is usually minor and healing often occurs in about a week, a more severe sunburn may require medical attention. Skin becomes red, painful, and abnormally warm after sun exposure. Sunburn can be easily avoided by wearing sunscreen with proper SPF for your skin.

Treatment:

1. Avoid repeated sun exposure.
2. Apply cold compresses or immerse the sunburned area in cool water.
3. Apply Aloe or other sunburn specific product.
4. Apply moisturizing lotion to affected areas (only after initial burn cooled). Do not use salve, butter, or ointment.
5. Do not break blisters.

Heat Rash: Heat rash is a skin irritation caused by excessive sweating during hot, humid weather. Heat rash looks like a red cluster of pimples or small blisters. It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases.

Treatment:

The best treatment for heat rash is to provide a cooler, less humid environment. Keep the affected area dry. Dusting powder may be used to increase comfort.

Dehydration: Dehydration occurs when a person's body loses more fluids (like sweat or urine) than he or she consumes.

Warning signs of dehydration:

- Frequent thirst
- Dry lips and tongue
- Muscle cramping
- Bright-colored or dark urine

Treatment::

If you think you are dehydrated, drink plenty of water and sports drinks that have added salts, and rest.

Avoiding Heat-related Illnesses:

1. *Drink plenty of fluids!* In hot weather, you need to drink more fluid than you would normally. Drink two to four glasses of cool fluids each hour and ones that do not contain alcohol, or large amounts of sugar--these actually cause you to lose more body fluid. Also avoid very cold drinks, because they can cause stomach cramps.

2. *Replace salts and minerals.* Heavy sweating removes salt and minerals from the body. A sports beverage can replace the salt and minerals you lose in sweat.

3. *Wear appropriate clothing and sunscreen.* Choose lightweight, light-colored, loose-fitting clothing that will cover most of your body. Wear a wide-brimmed hat along with sunglasses, and by putting on sunscreen of SPF 15 or higher (the most effective products say "broad spectrum" or "UVA/UVB protection" on their labels) 30 minutes prior to going out. Continue to reapply it according to the package directions.

4. *Pace yourself!* If you are not accustomed to working in a hot environment, start slowly and pick up the pace gradually. If exertion in the heat makes your heart pound and leaves you gasping for breath, STOP all activity. Get into a cool area or at least into the shade, and rest, especially if you become lightheaded, confused, weak, or faint.

5. *Use a buddy system.* When working in the heat, monitor the condition of your co-workers and have someone do the same for you. Heat-induced illness can cause a person to become confused or lose consciousness.

6. *Adjust to the environment.* Be aware that any sudden change in temperature, such as an early summer heat wave, will be stressful to your body. You will have a greater tolerance for heat if you limit your physical activity until you become accustomed to the heat. If you travel to a hotter climate, allow several days to become acclimated before attempting any vigorous exercise, and work up to it gradually.

More information on heat related illnesses can be found at:
http://www.bt.cdc.gov/disasters/extremeheat/heat_guide.asp
http://www.fayettehospital.org/oth/Page.asp?PageID=OTH000044
http://www.orcbs.msu.edu/occupational/programs_guidelines/heat_stress/heatstressguide.pdf

Thunderstorms and Lightning

Stay Alert
Monitor local weather conditions regularly with a special weather radio or AM/FM radio.

- Recognize the signs of an oncoming thunder and lightning storm - towering clouds with a "cauliflower" shape, dark skies and distant rumbles of thunder or flashes of lightning. Do not wait for lightning to strike nearby before taking cover.

Seek Shelter

- Look for a large, enclosed building when a thunder or lightning storm threatens. That's the best choice.
- If you are in a car and it has a hard top, stay inside and keep the windows rolled up.
- Avoid small sheds and lean-tos or partial shelters, like pavilions.
- Stay at least a few feet away from open windows, sinks, toilets, tubs, showers, electric boxes and outlets, and appliances. Lightning can flow through these symptoms and "jump" to a person.
- Do not shower or take a bath during a thunder or lightning storm
- Avoid using regular telephones, except in an emergency. If lightning hits the telephone lines, it could flow to the phone. Cell or cordless phones, not connected to the building's wiring, are safe to use.
- If your skin tingles or your hair stands on the end, a lightning strike may be about to happen. Crouch down on the balls of your feet with your feet close together. Keep your hands on your knees and lower your head. Get as low as possible without touching your hands or knees to the ground. DO NOT LIE DOWN!
- If you are swimming, fishing or boating and there are clouds, dark skies and distant rumbles of thunder or flashes of lightning, get to land immediately and seek shelter.
- If you are on land, find a low spot away from trees, metal fences, pipes, tall or long objects.
- If you are in the woods, look for an area of shorter trees. Crouch down away from tree trunks.

Helping someone struck by lightning
When someone is struck by lightning, get emergency medical help as soon as possible. If more than one person is struck by lightning, treat those who are unconscious first. They are at greatest risk of dying. A person struck by lightning may appear dead, with no pulse or breath. Often the person can be revived with cardiopulmonary resuscitation (CPR). There is no danger to anyone helping a person who has been struck by lightning - no electric charge remains. CPR should be attempted immediately.

More information about Thunderstorms and Lightening:
http://www.health.state.ny.us/environmental/emergency/weather/lightning/

Wildlife Encounters and Handling Protocols

All personnel should be trained in proper techniques for wildlife handling before working with animals in the field. Protective clothing should be worn as appropriate for the species being handled (e.g., gloves to prevent exposure to bodily fluids, thick gloves to protect against bites and scratches, tyvek suits or respiratory protection when needed). Wash hands often (using soap and water or hand sanitizer) and do not eat, drink, or smoke while working with animals. Disinfect work areas after use. Certain precautions are recommended for specific wildlife groups.

Small mammals: Exposure to hantavirus (and potentially Hantavirus Pulmonary Syndrome) can result from handling mice. Field workers should wear gloves to prevent exposure to feces and urine, and work with the mouse downwind and/or wear respiratory protection if desired. Most exposure to hantavirus occurs in enclosed areas with large amounts of dried mouse

fecal material. Respiratory protection should be worn in such locations. Detailed information is available at the CDC web site (http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5109a1.htm).

Medium mammals: Medium sized mammals (especially raccoons) can carry rabies in the study area (also bats). All personnel who handle these animals should have pre-exposure vaccination against rabies before working with the animals in the field. In case of possible exposure, post-exposure vaccination is also needed. Additional information and updates are available on the CDC website (http://198.246.98.21/rabies/).

Amphibians: This project does not specifically involve amphibians, so there is no need for you to handle any amphibians. However, because some people will anyway, assume that anytime you touch a toad that your hands have been exposed to bufotoxins and therefore wash your hands thoroughly before touching food or any part of your face. Also, many insect repellants and other chemicals are fatal to amphibians, so do not touch them unless they are protected from you.

Reptiles: Remember that birds are reptiles, and assume that all reptiles have *Salmonella.* Wash your hands with disinfectant after handling any animal. Many reptiles will defecate on you when captured.

Turtles: This project does not specifically involve turtles, so there is no need for you to handle any turtles. You might check box turtles for ticks if you have time. Turtles can give a nasty bite and can scratch. If you must, handle small turtles carefully, but do not handle large turtles at all unless you have been trained in proper procedures. Wash your hands with disinfectant after handling any animal, paying special attention to any wounds you have received.

Snakes: This project does not specifically involve snakes, so there is no need for you to handle any snakes. Nevertheless, you should familiarize yourself with the snake species where you are working, and be able to identify venomous species quickly. If you work in an area where venomous snake occur, you should always be wearing closed shoes, socks, and long pants. Look carefully before putting your hands into a bucket trap. You may encounter snakes under cover boards, in pit fall traps, on roads, or by chance in the field. Under no circumstances should you attempt to contact, touch, handle, or move a snake unless you know it is safe. Under cover boards and in chance encounters, you can just leave snakes undisturbed. In pit fall traps, they must be removed, but under most circumstances they can remain in the buckets overnight if you do not have appropriate equipment with you at the time. It is recommend that each team working in an area with rattlesnakes, cottonmouths, and/or copperheads keep a 40 inch snake hook in their field gear, and a second, smaller snake hook if they are working where there are coral snakes. With a hook it is easy and safe to remove snakes from pit falls. Release snakes outside the grid.

Snake bite: Even a bite from a "harmless" snake can cause infection or allergic reaction in some people. While each individual may experience symptoms differently, common venomous snake bites symptoms are bloody wound discharge, fang marks in the skin and swelling at the site of the bite, severe localized pain, diarrhea, fainting, dizziness, blurred vision, excessive sweating, fever, thirst, nausea and vomiting, rapid pulse.

The majority of snake bites, even venomous snake bites, have few complications. Nevertheless, call for emergency assistance immediately if someone has been bitten by a snake that might be venomous. Responding quickly is crucial. While waiting for emergency assistance: Wash the bite with soap and water, immobilize the bitten area and keep it lower than the heart, cover the area with a clean, cool compress or a moist dressing to minimize swelling and discomfort, and monitor vital signs.

If you are unable to get the victim to medical care within 30 minutes, the American Red Cross recommends:

- Apply a bandage, wrapped two to four inches above the bite, to help slow the venom. This should not cut off the flow of blood from a vein or artery - the band should be loose enough to slip a finger under it.

- A suction device can be placed over the bite to help draw venom out of the wound without making cuts. These devices are often included in commercial snake bite kits.

- Do not use ice, alcohol (internal or external), a tourniquet, or attempt to suck venom by mouth, or cut the skin.

Lizards: Lizards can bite and scratch enough to draw blood but none of those we will encounter are dangerous. Usually it is more important to capture the lizard than to worry about a minor scratch. Wash your hands with disinfectant after handling any animal, paying special attention to any wounds you have received.

Birds: Highly pathogenic avian influenza (HPAI, e.g., H5N1) has not been reported in the study area, but it could appear during the study. Birds should be handled with care, with the bird downwind if possible, and examination gloves should be worn when collecting blood or other body fluids. Respiratory protection (e.g., N95 face masks) is also recommended for close work with wild birds. Additional information is available online from the USGS National Wildlife Health Center (http://www.nwhc.usgs.gov/publications/wildlife_health_bulletins/WHB_05_03.jsp).

More information on safe handling of animals can be found at: http://safetyservices.ucdavis.edu/occupational-health-services/acu/educational-materials/zoonosis-information

Working alone

A person is considered “working alone" if the individual is working by his/herself such that assistance is not readily available should some injury, illness, or emergency arises.

Please be aware of the potential hazards of working alone.

- Always carry some sort of communication when working alone (i.e. cell phone or “walkie-talkie”)
- Always let someone know where you are going and when you will be back.
- Know where the first aid kit is.
- Know take proper safety precautions and bring PPE

Allergies, Asthma, and other Medications

It is important to let your supervisors know if you have any serious medical conditions requiring certain medications or care. Let your supervisors know of any allergies (food and insect bite/stings) you have, medications you make take, and where they can find them if needed.

Sharing this information is important for your safety and for the safety of all people working on this project.

Health Care Facility Locations

First aid kits
First aid kits will be available at every field site and you should always know where to find it. Please check with your supervisor to find out its location at your study site.

Hospitals, Urgent Care, and Doctors
Each institution involved with this study will have its own set of protocols and locations for seeking medical attention. Known where the closest emergency facilities are located BEFORE you begin field work and where to seek medical attention for non-life threatening medical situations. Please check with your supervisor for this information.

Safety Training
Each institution will also have a set of safety training courses (blood borne pathogens, respirator fit, first air, CPR, etc…) needed to be completed before field work begins. Please check with your supervisor to find what courses you need to complete.