Disaster Response Health And Safety Manual

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Preface

This accompanying manual, the ***Disaster Response Health and Safety Manual*** was designed to be a "hands on" field guide for disaster response field teams for personal health and safety recognition, evaluation, and control. This information was largely collected from **The Department of Health and Human Services, Centers for Disease Control and Prevention**, web sites. It is a collection of the major topics that are thought to be the most likely areas of concern for disaster field personnel going into unknown situations and locations, potentially exposed to unknown personal and occupational hazards. This manual was meant to be very basic to cover only the essential information necessary.

At this point, it is believed that this manual is as complete as it can be, based on the knowledge known at this time. During your field experience you may notice some shortcomings in its content and design as not every situation can be covered and/or adequately addressed. There are many variables to a natural disaster that cannot be foreseen from outside the field or from every situation. Whatever ideas or observations you may have learned in the field would be worthwhile to consider for updating the manual or improving its usefulness for future field personnel. Please bring back this information for consideration. Your contribution for the benefit of future field teams cannot over emphasized. Thank you for your commitment and contribution. Essayons.

"Safety Is No Accident".

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Table of Contents

Key Facts

Immunization Information

Personal Protective Equipment

Personal Hygiene

Infectious Disease Information

Occupational Hazards

Key Facts

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After a Hurricane: Key Facts About Infectious Disease

Although infectious diseases are a frightening prospect, widespread outbreaks of infectious disease after hurricanes are not common in the United States. Rare and deadly exotic diseases, such as cholera or typhoid, do not suddenly break out after hurricanes and floods in areas where such diseases do not naturally occur.

Communicable disease outbreaks of diarrhea and respiratory illness can occur when water and sewage systems are not working and personal hygiene is hard to maintain as a result of a disaster. However, no disease outbreaks have been reported as of September 3, 2005 in areas affected by Hurricane Katrina.

- **Decaying bodies create very little risk for major disease outbreaks.**
- **Outbreaks of infectious diseases following hurricanes are rare** in developed countries (such as the United States) and only slightly more common in the developing world.
- Numbers of short-term, self-limiting gastrointestinal illnesses and respiratory infections sometimes increase in developed countries. However, numbers of communicable diseases (including gastrointestinal and respiratory illnesses as well as cholera and typhoid) more typically **do not increase** in either developed or developing countries.
- Unless a disease is brought into a disaster area from elsewhere, any outbreaks that occur are almost always from diseases that were already in the disaster-affected area before the disaster struck.
- **Because cholera and typhoid are not commonly found in the U.S. Gulf States area, it is very unlikely that they would occur after Hurricane Katrina.**
- Communicable disease outbreaks can occur when sanitation and hygiene are compromised as a result of a disaster. However, no disease outbreaks have been reported to date in areas affected by Hurricane Katrina.
- As has been the case in past hurricanes, the U.S. Department of Health and Human Services quickly sets up tracking systems that monitor illnesses in hurricane-affected areas. In the unlikely event that a disease outbreak occurs, these systems provide an early warning that enables prompt public health response.

For more information on how to protect yourself from disease after a hurricane, see CDC's guidance, Key Facts About Hurricane Recovery: Protect Your Health and Safety After a Hurricane (http://www.bt.cdc.gov/disasters/hurricanes/recovery.asp).

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Immunization Information

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Department of Health and Human Services
Centers for Disease Control and Prevention

Interim Immunization Recommendations for Emergency Responders: Hurricane Katrina

Required immunizations:

1. Tetanus and diphtheria toxoid (receipt of primary series, and Td booster within 10 years)
2. Hepatitis B vaccine series for persons who will be performing direct patient care or otherwise expected to have contact with bodily fluids

There is no indication for the following vaccines given the anticipated conditions in the region:

- **hepatitis A vaccine** (low probability of exposure, even under these conditions, in U.S.) No transmission from contaminated water has been identified in the U.S. since the 1980's. Hepatitis A outbreaks have not occurred following other hurricanes or floods in other parts of the country, including the devastating hurricanes in Florida last year, and the Midwestern floods of the late 1990's. The Gulf Region has had few hepatitis A cases in recent years, with less than 10 in the past 3 months reported from the New Orleans area. Thus, even though the water and sewage systems are damaged or out of operation in many areas along the Gulf Coast, the risk of a hepatitis A epidemic is extremely low. Vaccine will take at least one to two weeks to provide substantial immunity.
- **typhoid vaccine** (low probability of exposure, even under these conditions, in U.S.).
- **cholera vaccine** (low probability of exposure, even under these conditions, in U.S., plus no licensed cholera vaccine available in the U.S.).
- **meningococcal vaccine** (no expectation of increased risk of meningococcal disease among emergency responders).
- **rabies vaccine** series (the full series is required for protection). Persons who are exposed to potentially rabid animals should be evaluated and receive standard post-exposure prophylaxis, as clinically appropriate.

For more information, visit www.bt.cdc.gov/disasters/hurricanes,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).
September 1, 2005

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CENTERS FOR DISEASE CONTROL AND PREVENTION
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Personal Protective Equipment

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NIOSH Interim Guidance on Personal Protective Equipment and Clothing for Flood Response Worker

The National Institute for Occupational Safety and Health (NIOSH) provides the following interim guidelines and warnings to flood cleanup workers. The hazards in flood waters are likely variable and can include sewage, household chemicals and cleaning solutions, petroleum products, hazardous industrial chemicals, pesticides, and flammable liquids. Workers must also be aware of dangers from physical hazards such as obstacles covered by flood waters (storm debris, depressions, drainage openings, ground erosion) and from displaced reptiles or other animals.

Workers and volunteers involved with flood cleanup should avoid direct skin contact with flood waters if possible and through the use of appropriate PPE and clothing. In most instances, the selection of PPE will be dependent on site specific conditions, hazards, and tasks; the list below provides interim guidance on PPE and clothing for flood response workers responding to Hurricane Katrina:

- Electrically insulated, watertight boots with steel shank, toe, and insole. Tennis shoes or s neakers should *not* be worn because they will transfer contamination and will not prevent punctures, bites, or crush injuries. Hip waders may be appropriate to help prevent contact with flood waters;
- Heavy, waterproof, cut-resistant work gloves. Other types of protective gloves may be required if handling identified material hazards;
- Goggles, safety glasses with side shields or full face shields. Sun/glare-protective lenses may be needed in some work settings;
- Soft hat or other protective head cover. Wear an American National Standards Institute (ANSI) rated hardhat if there is any danger of falling debris or electrical hazards;
- Hearing protection (when working in an environment with any noise that you must shout over to be heard);
- Comfortable, form fitting, light weight clothing including long pants and a long sleeved shirt or coveralls;
- Under some work conditions, NIOSH approved respirators may be necessary (e.g., for exposures to mold-contaminated materials/environments, or other recognized chemical, physical, or biological hazards).

Additional PPE, respiratory protection, or clothing may be required when specific exposure hazards are identified or expected at the work site. In some instances, t he protective ensemble components (garment, boots and gloves) may need to be impervious to contaminated flood or other site-specific chemical, physical, or biological hazards. In all instances, w orkers are advised to wash their hands with soap and clean water, especially before eating or drinking. Protect any cuts or abrasions with waterproof gloves and dressings. The use of insect repellant, sun block and lip balm may also be required for some work environments. Drink plenty of bottled water and take frequent rest breaks to avoid overexertion.

NIOSH Interim Guidance on Pe Protective Equi and Clothing for Flo Response Work

Related Links :

NIOSH Storm and Flo page

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Individual Team Member Checklist
For OSHA Teams Going to the Katrina Disaster Site

This is being made available to help others who are going to the Gulf.

Team members should be as individually mobile as possible.
Try to limit your personal belongings to what you can carry.

Personal Items:

- ❒ Immunization record and blood type
- ❒ Four changes of clothing appropriate for the location, weather, and kind of assignment.
- ❒ Rain gear
- ❒ Toilet articles (Don't take any items in glass bottles)
- ❒ Alcohol-based hand sanitizer
- ❒ Flashlight with spare batteries
- ❒ Alarm clock
- ❒ Pocketknife – not in carry-on luggage!
- ❒ Prescription medicine for expected length of stay (with considerable safety margin)
- ❒ Appropriate over-the-counter meds for minor illnesses (e.g., URIs/allergies, minor GI upsets, minor aches/pains; hydrocortisone cream; antibiotic cream; band-aids) [may not be readily available at destination]
- ❒ Sunscreen (SPF-15 or higher)
- ❒ Insect repellent
- ❒ Lip salve
- ❒ Vitamins
- ❒ Cap or hat for sun and rain
- ❒ Extra pair of glasses or contacts (If you wear contacts, anticipate dusty conditions at disaster sites.)
- ❒ Sun glasses
- ❒ Bottled water for at least 24 hours
- ❒ Snack foods/energy bars for 1-2 days

Business items:

- ❒ Travel authorization (TA)
- ❒ Government–issued photo I.D.
- ❒ Adequate amount of U.S. currency/traveler's checks (check to see if you will be able to cash them) or government-issues credit card
- ❒ Contact information for reaching your home office/supervisor and family
- ❒ Earplugs
- ❒ Business cards

Information To Be Left with Supervisor:

- ❒ Contact information sheet for family in the event of an emergency.
- ❒ Travel Authorization

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Special Items: (Items you may personally need)

- ❒ Mace or pepper spray
- ❒ Inhalers for bee stings
- ❒ Cortisone or calamine lotion for poison ivy, poison sumac or poison oak exposure.
- ❒ Epi-pen (Atropine) for bee stings (for those allergic to bee stings)

Personal Hygiene

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Hand Hygiene in Emergency Situations

After an emergency, it can be difficult to find running water. However, it is still important to wash your hands to avoid illness. It is best to wash your hands with soap and water but when water isn't available, you can use alcohol-based products made for washing hands. Below are some tips for washing your hands with soap and water and with alcohol-based products.

When should you wash your hands?

1. Before preparing or eating food.
2. After going to the bathroom.
3. After cleaning up a child who has gone to the bathroom.
4. Tending to someone who is sick.
5. After handling uncooked foods, particularly raw meat, poultry, or fish.
6. After blowing your nose, coughing, or sneezing.
7. After handling an animal or animal waste.
8. After handling garbage.
9. Treating a cut or wound.

Techniques for Hand Washing with Alcohol-Based Products

When hands are visibly dirty, they should be washed with soap and water when available.

However, if soap and water are not available, use an alcohol-based product for washing your hands. When using an alcohol-based handrub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry. Note that the volume needed to reduce the number of bacteria on hands varies by product.

Alcohol-based handrubs significantly reduce the number of germs on skin, are fast acting.

Techniques for Hand Washing with Soap and Water

Proper techniques to use when washing your hands with soap and water:

1. Place your hands together under water (warm water if possible).
2. Rub your hands together for at least 10 seconds (with soap if possible). Wash all surfaces well, including wrists, palms, backs of hands, fingers, and under the fingernails.
3. Clean the dirt from under your fingernails.
4. Rinse the soap from your hands.
5. Dry your hands completely with a clean towel if possible (this helps remove the germs). However, if towels are not available it is okay to air dry your hands.
6. Pat your skin rather than rubbing to avoid chapping and cracking.
7. If you use a disposable towel, throw it in the trash.

For more information, visit www.bt.cdc.gov
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

September 2, 2005

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Infection Control Prevention Guidance for Community Shelters Following Disasters

Community shelters provide housing for persons displaced from their homes following natural disasters such as hurricanes, floods, and earthquakes. In these settings, individuals share living space. Some individuals may have health problems, including acute or chronic infectious diseases. These recommendations provide basic infection control information that will help to prevent exposure to or transmission of infectious agents.

General Infection Prevention Techniques

Use of these infection prevention measures by all staff and shelter residents can reduce the spread of infections and infectious diseases.

- Wash your hands and those of children regularly. Alcohol gels are an adequate substitute when soap and clean water are not readily available.
- Maintain a clean living environment.
- Maintain good personal hygiene techniques including the following:
  - Cover your cough with tissues, disposing tissues in the trash, and performing hand hygiene
  - Follow good hygienic practices during food preparation
  - Do not share eating utensils or drinking containers
  - Do not share personal toilet articles such as combs, razors, toothbrushes, or towels with any one else
  - Dispose of razor blades and needles used for medications in containers designed for sharps disposal
  - Bathe on a regular basis
  - Wash clothing regularly

Hand Hygiene

After an emergency, it can be difficult to find running water. However, it is still important to wash your hands to avoid illness. It is best to wash your hands with soap and water but, when water isn't available, you can use alcohol-based products made for washing hands. Below are some tips for washing your hands with soap and water and with alcohol-based products.

When should you wash your hands?

1. Before preparing or eating food.
2. After going to the bathroom.
3. After changing a diaper or cleaning up a child who has gone to the bathroom.
4. Before and after tending to someone who is sick.
5. After handling uncooked foods, particularly raw meat, poultry, or fish.
6. After blowing your nose, coughing, or sneezing.
7. After handling an animal or animal waste.
8. After handling garbage.
9. Before and after treating a cut or wound.

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Techniques for Hand Washing with Alcohol-Based Products

When hands are visibly dirty, they should be washed with soap and water if available. However, if soap and water are not available, use an alcohol-based product for washing your hands. When using an alcohol-based handrub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry. Note that the volume needed to reduce the number of bacteria on hands varies by product. Alcohol-based handrubs significantly reduce the number of germs on skin and are fast acting.

Proper Techniques to Use When Washing your Hands with Soap and Water:

1. Place your hands together under water (warm water if possible).
2. Rub your hands together for at least 10 seconds (with soap if possible). Wash all surfaces thoroughly, including wrists, palms, backs of hands, fingers, and under the fingernails.
3. Clean the dirt from under your fingernails.
4. Rinse the soap from your hands.
5. Dry your hands completely with a clean disposable towel if possible (this helps remove the germs). However, if towels are not available it is acceptable to air dry your hands.
6. Pat your skin rather than rubbing to avoid chapping and cracking.
7. If you use a disposable towel, throw it in the trash.

Cleaning the Living Environment and Personal Items

Keeping items clean helps to reduce the spread of infections to residents and staff.

- Clean surfaces when visibly dirty and on a regular schedule:
  - Kitchens and bathrooms daily and as necessary
  - Living areas at least weekly and more often if necessary
  - Bed frames, mattresses and pillows between occupants
  - Other furniture weekly and as needed
  - Spills immediately
- Sanitize (i.e., reducing contamination to safer levels) surfaces that are most likely to be sources of germs:
  - Food preparation surfaces
  - Diaper changing surfaces
  - Body fluid spills (e.g., vomitus, blood, feces)
- Use the appropriate cleaning agents:
  - Detergents and water for surfaces, common household products are acceptable
  - Sanitize with a product that the label says is a sanitizer or mix 1 teaspoon of household bleach in 1 quart of water
- Provide facilities for washing clothing on a regular basis
  - Remove all bulk solids (e.g., stool) before laundering clothing
  - Low temperature water can be used for washing
  - Wash clothing in a washing machine, if possible
  - Use household detergents for washing clothing
  - Household bleach can be used in the rinse water
  - Dry clothes in a dryer, if possible
  - There is no need to disinfect the tubs of washers or tumblers of dryers if cycles a run until they are completed
  - Make sure donated clothing is washed before distribution

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- Provide proper trash removal
  - Contact local authorities to determine local requirements for disposal of household and medical waste, such as needles and bandages
  - Use trash receptacles lined with plastic bags that can be securely tied
  - Remove trash bags and tie them securely before they are overfilled
  - Place trash in an area separated from the living spaces, preferably in trash bins
  - Have waste pick ups scheduled frequently, daily if possible

Staff Management of Sheltered Persons with Infectious Diseases

Persons living in group situations can spread infections such as colds and skin infections and other infections through diarrhea and vomiting. Upon arrival at a shelter, all residents should be screened for the following conditions:

- Fever
- Bad cough
- Skin rash
- Open sore(s)
- Vomiting
- Diarrhea

Persons with any of the above conditions should be referred for medical evaluation. If a potentially infectious condition is determined to be present, ill residents should be isolated from other shelter residents or placed in a special needs shelter (see below).

To reduce the potential for spread of droplets between shelter residents, staff should separate sleeping cots by 3 feet, if possible.

Additional Recommendations for Special-Needs Shelters

Special-needs shelters are defined as shelters that are capable of providing safe refuge to those individuals who require the supervision of a healthcare professional during the time of a disaster. The special-needs shelter is designed to care for:

- People with minor health or medical conditions that require professional observation, assessment, and maintenance and can not be handled by the general public shelter staff or exceed the capability of the general public shelter
- People with infectious health conditions who require precautions or isolation that can not be handled by general public shelter staff
- People with chronic conditions who require assistance with activities of daily living or more skilled nursing care but do not require hospitalization
- People who need medications or vital sign readings and are unable to receive such without professional assistance

Standard Precautions* should be applied to all residents to protect residents and staff from contact with infectious agents in recognized and unrecognized source of infection. Each resident should be screened at the time of entry to the special needs shelter to detect any conditions necessitating isolation and/or use of Transmission-Based Precautions. http://www.cdc.gov/ncidod/hip/ISOLAT/Isolat.htm Personal protective equipment (e.g., gloves, masks, and gowns) should be provided for healthcare personnel who staff the special-needs shelter. If possible, special-needs shelter staff should have access to healthcare personnel who are trained in infection control.

*Standard Precautions Summary

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During the care of any patient with symptoms of a respiratory infection, healthcare personnel should adhere to Standard Precautions:

- Wear gloves if hand contact with respiratory secretions or potentially contaminated surfaces is anticipated.
- Wear a gown if soiling of clothes with a patient's respiratory secretions is anticipated.
- Change gloves and gowns after each patient encounter and perform hand hygiene.
- Decontaminate hands before and after touching the patient, after touching the patient's environment, or after touching the patient's respiratory secretions, whether or not gloves are worn.
- When hands are visibly dirty or contaminated with respiratory secretions, wash hands with soap (either plain or antimicrobial) and water.
- If hands are not visibly dirty, use an alcohol-based hand rub for routinely decontaminating hands in clinical situations. Alternatively, wash hands with soap (either plain or antimicrobial) and water.

Related Links:

- Keep Food and Water Safe after a Natural Disaster or Power Outage (http://www.bt.cdc.gov/disasters/foodwater.asp)

- Cooking for Groups: A Volunteer's Guide to Food Safety (http://www.fsis.usda.gov/OA/pubs/cfg/cfg.htm#contents)

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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FACT SHEET

Facts About Personal Cleaning and Disposal of Contaminated Clothing

Some kinds of chemical accidents or attacks may cause you to come in contact with dangerous chemicals. Coming in contact with a dangerous chemical may make it necessary for you to remove and dispose of your clothing right away and then wash yourself. Removing your clothing and washing your body will reduce or remove the chemical so that it is no longer a hazard. This process is called decontamination.

People are decontaminated for two primary reasons:

1. to prevent the chemical from being further absorbed by their body or from spreading on their body, and
2. to prevent the chemical from spreading to other people, including medical personnel, who must handle or who might come in contact with the person who is contaminated with the chemical.

Most chemical agents can penetrate clothing and are absorbed rapidly through the skin. Therefore, the most important and most effective decontamination for any chemical exposure is decontamination done within the first minute or two after exposure.

How to know if you need to wash yourself and dispose of your clothing

In most cases, emergency coordinators will let you know if a dangerous chemical has been released and will tell you what to do.

In general, exposure to a chemical in its liquid or solid form will require you to remove your clothing and then thoroughly wash your exposed skin. Exposure to a chemical in its vapor (gas) form generally requires you only to remove your clothing and the source of the toxic vapor.

If you think you have been exposed to a chemical release, but you have not heard from emergency coordinators, you can follow the washing and clothing disposal advice in the next section.

What to do

Act quickly and follow the instructions of local emergency coordinators. Every situation can be different, so local emergency coordinators might have special instructions for you to follow. The three most important things to do if you think you may have been exposed to a dangerous chemical are to (1) quickly remove your clothing, (2) wash yourself, and (3) dispose of your clothing. Here's how:

- *Removing your clothing:*
  - Quickly take off clothing that has a chemical on it. Any clothing that has to be pulled over your head should be cut off instead of being pulled over your head.
  - If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.
- *Washing yourself:*

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- As quickly as possible, wash any chemicals from your skin with large amounts of soap and water. Washing with soap and water will help protect you from any chemicals on your body.
- If your eyes are burning or your vision is blurred, rinse your eyes with plain water for 10 to 15 minutes. If you wear contacts, remove them and put them with the contaminated clothing. Do not put the contacts back in your eyes (even if they are not disposable contacts). If you wear eyeglasses, wash them with soap and water. You can put your eyeglasses back on after you wash them.

- *Disposing of your clothes:*
  - After you have washed yourself, place your clothing inside a plastic bag. Avoid touching contaminated areas of the clothing. If you can't avoid touching contaminated areas, or you aren't sure where the contaminated areas are, wear rubber gloves or put the clothing in the bag using tongs, tool handles, sticks, or similar objects. Anything that touches the contaminated clothing should also be placed in the bag. If you wear contacts, put them in the plastic bag, too.
  - Seal the bag, and then seal that bag inside another plastic bag. Disposing of your clothing in this way will help protect you and other people from any chemicals that might be on your clothes.
  - When the local or state health department or emergency personnel arrive, tell them what you did with your clothes. The health department or emergency personnel will arrange for further disposal. Do not handle the plastic bags yourself.

After you have removed your clothing, washed yourself, and disposed of your clothing, you should dress in clothing that is not contaminated. Clothing that has been stored in drawers or closets is unlikely to be contaminated, so it would be a good choice for you to wear.

You should avoid coming in contact with other people who may have been exposed but who have not yet changed their clothes or washed. Move away from the area where the chemical was released when emergency coordinators tell you to do so.

How you can get more information about personal cleaning and disposal of contaminated clothing

You can contact one of the following:

- State and local health departments
- Centers for Disease Control and Prevention (CDC)
  - Public Response Hotline (CDC)
    - English (888) 246-2675
    - Español (888) 246-2857
    - TTY (866) 874-2646
  - Emergency Preparedness and Response Web site (http://www.bt.cdc.gov/)
  - E-mail inquiries: cdcresponse@ashastd.org
  - Mail inquiries:
    Public Inquiry c/o BPRP
    Bioterrorism Preparedness and Response Planning
    Centers for Disease Control and Prevention
    Mailstop C-18

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Atlanta, GA 30333

This fact sheet is based on CDC's best current information. It may be updated as new information becomes available.

Last reviewed on 03/23/05.

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.

For more information, visit www.bt.cdc.gov or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY)

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Infectious Disease Information

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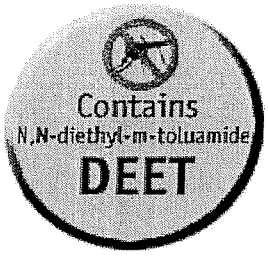
Fight The Bite!
Avoid Mosquito Bites to Avoid Infection

When dealing with West Nile virus, prevention is your best bet. Fighting mosquito bites reduces your risk of getting this disease, along with others that mosquitoes can carry. Take the commonsense steps below to reduce your risk:

- avoid bites and illness;
- clean out the mosquitoes from the places where you work and play;
- help your community control the disease.

Something to remember: The chance that any one person is going to become ill from a single mosquito bite remains low. The risk of severe illness and death is highest for people over 50 years old, although people of all ages can become ill.

Avoid Mosquito Bites



Apply Insect Repellent Containing DEET
(Look for: *N,N-diethyl-meta-toluamide*) to exposed skin when you go outdoors. Even a short time being outdoors can be long enough to get a mosquito bite. For details on when and how to apply repellent, see Insect Repellent Use and Safety (http://www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm) in our Questions and Answers (http://www.cdc.gov/ncidod/dvbid/westnile/q&a.htm) pages. See also Using Insect Repellent Safely (http://www.epa.gov/pesticides/factsheets/alpha_fs.htm) from the EPA.

Get double protection: wear long sleeves during peak mosquito biting hours, and spray DEET repellent directly onto your clothes.

Clothing Can Help Reduce Mosquito Bites
When possible, wear long-sleeves, long pants and socks when outdoors. Mosquitoes may bite through thin clothing, so spraying clothes with repellent containing permethrin or DEET will give extra protection. Don't apply repellents containing permethrin directly to skin. Do not spray repellent containing DEET on the skin under your clothing.

Be Aware of Peak Mosquito Hours
The hours from dusk to dawn are peak mosquito biting times for many species of mosquitoes. Take *extra* care to use repellent and protective clothing during evening and early morning -- or consider avoiding

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Fact Sheet for the general public

Cryptosporidium Infection
Cryptosporidiosis (KRIP-toe-spo-rid-ee-OH-sis)

What is cryptosporidiosis?

Cryptosporidiosis is a diarrheal disease caused by microscopic parasites of the genus *Cryptosporidium*. Once an animal or person is infected, the parasite lives in the intestine and passes in the stool. The parasite is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it very resistant to chlorine-based disinfectants. Both the disease and the parasite are commonly known as "crypto."

During the past two decades, crypto has become recognized as one of the most common causes of waterborne disease within humans in the United States. The parasite may be found in drinking water and recreational water in every region of the United States and throughout the world.

How is cryptosporidiosis spread?

Cryptosporidium lives in the intestine of infected humans or animals. Millions of crypto germs can be released in a bowel movement from an infected human or animal. Consequently, *Cryptosporidium* is found in soil, food, water, or surfaces that have been contaminated with infected human or animal feces. If a person swallows the parasite they become infected. You **cannot** become infected through contact with blood. The parasite can be spread by

- Accidentally putting something into your mouth or swallowing something that has come into contact with feces of a person or animal infected with *Cryptosporidium*.
- Swallowing recreational water contaminated with *Cryptosporidium* (Recreational water includes water in swimming pools, hot tubs, jacuzzis, fountains, lakes, rivers, springs, ponds, or streams that can be contaminated with sewage or feces from humans or animals.) **Note:** *Cryptosporidium* can survive for days in swimming pools with adequate chlorine levels.
- Eating uncooked food contaminated with *Cryptosporidium*. Thoroughly wash with clean, safe water all vegetables and fruits you plan to eat raw. See below for information on making water safe.
- Accidentally swallowing *Cryptosporidium* picked up from surfaces (such as bathroom fixtures, changing tables, diaper pails, or toys) contaminated with feces from an infected person.

What are the symptoms of cryptosporidiosis?

The most common symptom of cryptosporidiosis is watery diarrhea. Other symptoms include:

- Dehydration
- Weight loss
- Stomach cramps or pain
- Fever
- Nausea
- Vomiting

Some people with crypto will have no symptoms at all. While the small intestine is the site most commonly affected, *Cryptosporidium* infections could possibly affect other areas of the digestive or the respiratory tract.

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How long after infection do symptoms appear?

Symptoms of cryptosporidiosis generally begin 2 to 10 days (average 7 days) after becoming infected with the parasite.

How long will symptoms last?

In persons with healthy immune systems, symptoms usually last about 1 to 2 weeks. The symptoms may go in cycles in which you may seem to get better for a few days, then feel worse again before the illness ends.

If I have been diagnosed with *Cryptosporidium*, should I worry about spreading the infection to others?

Yes, *Cryptosporidium* can be very contagious. Follow these guidelines to avoid spreading the disease to others:

1. Wash your hands with soap and water after using the toilet, changing diapers, and before eating or preparing food.
2. Do not swim in recreational water (pools, hot tubs, lakes or rivers, the ocean, etc.) if you have cryptosporidiosis and for at least 2 weeks after diarrhea stops. You can pass *Cryptosporidium* in your stool and contaminate water for several weeks after your symptoms have ended. This has resulted in outbreaks of cryptosporidiosis among recreational water users. **Note:** Cryptosporidium can be spread in a chlorinated pool because it is resistant to chlorine and, therefore, can live for days in chlorine-treated swimming pools.
3. Avoid fecal exposure during sexual activity.

Who is most at risk for cryptosporidiosis?

People who are most likely to become infected with *Cryptosporidium* include:

- Children who attend day care centers, including diaper-aged children
- Child care workers
- Parents of infected children
- International travelers
- Backpackers, hikers, and campers who drink unfiltered, untreated water
- Swimmers who swallow water while swimming in swimming pools, lakes, rivers, ponds, and streams
- People who drink from shallow, unprotected wells
- People who swallow water from contaminated sources.

Contaminated water includes water that has not been boiled or filtered. Several community-wide outbreaks of cryptosporidiosis have been linked to drinking municipal water or recreational water contaminated with *Cryptosporidium*.

Who is most at risk for getting seriously ill with cryptosporidiosis?

Although Crypto can infect all people, some groups are more likely to develop more serious illness.

- Young children and pregnant women may be more susceptible to the dehydration resulting from diarrhea and should drink plenty of fluids while ill.

If you have a severely weakened immune system, talk to your health care provider for additional guidance. You can also call the CDC AIDS HOTLINE toll-free at 1-800-342-2437. Ask for more information on cryptosporidiosis, or go to the CDC fact sheet *Preventing Cryptosporidiosis: A Guide for People with Compromised Immune Systems* available by visiting http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/factsht_crypto_prevent_ci.htm

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- If you have a severely weakened immune system, you are at risk for more serious disease. Your symptoms may be more severe and could lead to serious or life-threatening illness. Examples of persons with weakened immune systems include those with HIV/AIDS; cancer and transplant patients who are taking certain immunosuppressive drugs; and those with inherited diseases that affect the immune system.

What should I do if I think I may have cryptosporidiosis?

If you suspect that you have cryptosporidiosis, see your health care provider.

How is a cryptosporidiosis diagnosed?

Your health care provider will ask you to submit stool samples to see if you are infected. Because testing for Crypto can be difficult, you may be asked to submit several stool specimens over several days. Tests for Crypto are not routinely done in most laboratories; therefore, your health care provider should specifically request testing for the parasite.

What is the treatment for cryptosporidiosis?

A new drug, nitazoxanide, has been approved for treatment of diarrhea caused by *Cryptosporidium* in people with healthy immune systems. Consult with your health care provider for more information. Most people who have a healthy immune system will recover without treatment. The symptoms of diarrhea can be treated. If you have diarrhea, drink plenty of fluids to prevent dehydration. Rapid loss of fluids from diarrhea may be especially life threatening to babies; therefore, parents should talk to their health care provider about fluid replacement therapy options for infants. Anti-diarrheal medicine may help slow down diarrhea, but talk to your health care provider before taking it.

People who are in poor health or who have a weakened immune system are at higher risk for more severe and more prolonged illness. The effectiveness of nitazoxanide in immunosuppressed individuals is unclear. For persons with AIDS, anti-retroviral therapy that improves immune status will also decrease or eliminate symptoms of Crypto. However, even if symptoms disappear, cryptosporidiosis is usually not curable and the symptoms may return if the immune status worsens. See your health care provider to discuss anti-retroviral therapy used to improve your immune status.

How can I prevent cryptosporidiosis?

Practice good hygiene.

1. Wash hands thoroughly with soap and water. a. Wash hands after using the toilet and before handling or eating food (especially for persons with diarrhea). b. Wash hands after every diaper change, especially if you work with diaper-aged children, even if you are wearing gloves.
2. Protect others by not swimming if you are experiencing diarrhea (essential for children in diapers).

Avoid water that might be contaminated.

1. Do not swallow recreational water.
2. Do not drink untreated water from shallow wells, lakes, rivers, springs, ponds, and streams.
3. Do not drink untreated water during community-wide outbreaks of disease caused by contaminated drinking water.

For information on recreational water-related illnesses, visit CDC's Healthy Swimming website at http://www.cdc.gov/healthyswimming.

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4. Do not use untreated ice or drinking water when traveling in countries where the water supply might be unsafe.

> For information on choosing safe bottled water, see the CDC fact sheet entitled "Preventing Cryptosporidiosis: A Guide to Water Filters and Bottled Water," available by visiting http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/

In the United States, nationally distributed brands of bottled or canned carbonated soft drinks are safe to drink. Commercially packaged non-carbonated soft drinks and fruit juices that do not require refrigeration until after they are opened (those that are stored unrefrigerated on grocery shelves) also are safe.

If you are unable to avoid using or drinking water that might be contaminated, then you can make the water safe to drink by doing one of the following:

- Heat the water to a rolling boil for at least 1 minute. OR
- Use a filter that has an absolute pore size of at least 1 micron or one that has been NSF rated for "cyst removal."

> For information on choosing a water filter, see the CDC fact sheet entitled "Preventing Cryptosporidiosis: A Guide to Water Filters and Bottled Water," available by visiting http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/

Do not rely on chemicals to disinfect water and kill *Cryptosporidium*. Because it has a thick outer shell, this particular parasite is highly resistant to disinfectants such as chlorine and iodine.

Avoid food that might be contaminated.

1. Wash and/or peel all raw vegetables and fruits before eating.
2. Use safe, uncontaminated water to wash all food that is to be eaten raw.
3. Avoid eating uncooked foods when traveling in countries with minimal water treatment and sanitation systems.

Take extra care when traveling.

If you travel to developing nations, you may be at a greater risk for *Cryptosporidium* infection because of poorer water treatment and food sanitation. Warnings about food, drinks, and swimming are even more important when visiting developing countries. Avoid foods and drinks, in particular raw fruits and vegetables, tap water, or ice made from tap water, unpasteurized milk or dairy products, and items purchased from street vendors. These items may be contaminated with *Cryptosporidium*. Steaming-hot foods, fruits you peel yourself, bottled and canned processed drinks, and hot coffee or hot tea are probably safe. Talk with your health care provider about other guidelines for travel abroad.

Avoid fecal exposure during sexual activity.

This fact sheet is for information only and is not meant to be used for self-diagnosis or as a substitute for consultation with a health care provider. If you have any questions about the disease described above or think that you may have a parasitic

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Giardia Infection
Giardiasis (GEE-are-DYE-uh-sis)

What is giardiasis?

Giardiasis (GEE-are-DYE-uh-sis) is a diarrheal illness caused by a one-celled, microscopic parasite, *Giardia intestinalis* (also known as *Giardia lamblia*). Once an animal or person has been infected with *Giardia intestinalis*, the parasite lives in the intestine and is passed in the stool. Because the parasite is protected by an outer shell, it can survive outside the body and in the environment for long periods of time.
During the past 2 decades, *Giardia* infection has become recognized as one of the most common causes of waterborne disease (found in both drinking and recreational water) in humans in the United States. *Giardia* are found worldwide and within every region of the United States.

How do you get giardiasis and how is it spread?

The *Giardia* parasite lives in the intestine of infected humans or animals. Millions of germs can be released in a bowel movement from an infected human or animal. *Giardia* is found in soil, food, water, or surfaces that have been contaminated with the feces from infected humans or animals. You **can** become infected after accidentally swallowing the parasite; you **cannot** become infected through contact with blood. *Giardia* can be spread by:

- Accidentally putting something into your mouth or swallowing something that has come into contact with feces of a person or animal infected with *Giardia*.
- Swallowing recreational water contaminated with *Giardia*. Recreational water includes water in swimming pools, hot tubs, jacuzzis, fountains, lakes, rivers, springs, ponds, or streams that can be contaminated with sewage or feces from humans or animals.
- Eating uncooked food contaminated with *Giardia*.
- Accidentally swallowing *Giardia* picked up from surfaces (such as bathroom fixtures, changing tables, diaper pails, or toys) contaminated with feces from an infected person.

What are the symptoms of giardiasis?

Giardia infection can cause a variety of intestinal symptoms, which include

- Diarrhea
- Gas or flatulence
- Greasy stools that tend to float
- Stomach cramps
- Upset stomach or nausea.

These symptoms may lead to weight loss and dehydration. Some people with giardiasis have no symptoms at all.

How long after infection do symptoms appear?

Symptoms of giardiasis normally begin 1 to 2 weeks (average 7 days) after becoming infected.

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How long will symptoms last?

In otherwise healthy persons, symptoms of giardiasis may last 2 to 6 weeks. Occasionally, symptoms last longer.

Who is most likely to get giardiasis?

Anyone can get giardiasis. Persons more likely to become infected include

- Children who attend day care centers, including diaper-aged children
- Child care workers
- Parents of infected children
- International travelers
- People who swallow water from contaminated sources.
- Backpackers, hikers, and campers who drink unfiltered, untreated water
- Swimmers who swallow water while swimming in lakes, rivers, ponds, and streams
- People who drink from shallow wells

Contaminated water includes water that has not been boiled, filtered, or disinfected with chemicals. Several community-wide outbreaks of giardiasis have been linked to drinking municipal water or recreational water contaminated with *Giardia*.

What should I do if I think I may have giardiasis?

See your health care provider.

How is a *Giardia* infection diagnosed?

Your health care provider will likely ask you to submit stool samples to check for the parasite. Because *Giardia* can be difficult to diagnose, your provider may ask you to submit several stool specimens over several days.

What is the treatment for giardiasis?

Several prescription drugs are available to treat *Giardia*. Although *Giardia* can infect all people, young children and pregnant women may be more susceptible to dehydration resulting from diarrhea and should, therefore, drink plenty of fluids while ill.

My child does not have diarrhea, but was recently diagnosed as having giardiasis. My health care provider says treatment is not necessary. Is this true?

Treatment is not necessary when the child has no symptoms. However, there are a few exceptions. If your child does not have diarrhea, but is having nausea, fatigue (very tired), weight loss, or a poor appetite, you and your health care provider may wish to consider treatment. If your child attends a day care center where an outbreak is continuing to occur despite efforts to control it, screening and treating children who have no obvious symptoms may be a good idea. The same is true if several family members are ill, or if a family member is pregnant and therefore not able to take the most effective anti-*Giardia* medications.

If I have been diagnosed with giardiasis, should I worry about spreading

the infection to others?

Yes, a *Giardia* infection can be very contagious. Follow these guidelines to avoid spreading giardiasis to others:

1. Wash your hands with soap and water after using the toilet, changing diapers, and before eating or preparing food.
2. Do not swim in recreational water (pools, hot tubs, lakes or rivers, the ocean, etc.) if you have *Giardia* and for at least 2 weeks after diarrhea stops. You can pass *Giardia* in your stool and contaminate water for several weeks after your symptoms have ended. This has resulted in outbreaks of *Giardia* among recreational water users.
3. Avoid fecal exposure during sexual activity.

How can I prevent a *Giardia* infection?

Practice good hygiene.

1. Wash hands thoroughly with soap and water.
   a. Wash hands after using the toilet and before handling or eating food (especially for persons with diarrhea).
   b. Wash hands after every diaper change, especially if you work with diaper-aged children, even if you are wearing gloves.
2. Protect others by not swimming if you are experiencing diarrhea (essential for children in diapers).

Avoid water that might be contaminated.

1. Do not swallow recreational water.
2. Do not drink untreated water from shallow wells, lakes, rivers, springs, ponds, and streams.
3. Do not drink untreated water during community-wide outbreaks of disease caused by contaminated drinking water.
4. Do not use untreated ice or drinking water when traveling in countries where the water supply might be unsafe.

> For information on recreational water-related illnesses, visit CDC's Healthy Swimming website at http://www.cdc.gov/healthyswimming.

In the United States, nationally distributed brands of bottled or canned carbonated soft drinks are safe to drink. Commercially packaged non-carbonated soft drinks and fruit juices that do not require refrigeration until after they are opened (those that are stored unrefrigerated on grocery shelves) also are safe.

> For information on choosing safe bottled water, see the CDC fact sheet entitled "Preventing Cryptosporidiosis: A Guide to Water Filters and Bottled Water," available by visiting http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/

If you are unable to avoid using or drinking water that might be contaminated, then you can make the water safe to drink by doing one of the following:

- Heat the water to a rolling boil for at least 1 minute, OR
- Use a filter that has an absolute pore size of at least 1 micron or one that has been NSF rated for "cyst removal."
- If you cannot heat the water to a rolling boil or use a recommended filter, then try chemically treating the water by chlorination or iodination.

Using chemicals may be less effective than boiling or filtering because the amount of chemical required to make the water safe is highly dependent on the temperature, pH, and cloudiness of the water.

For information on choosing a water filter, see the CDC fact sheet entitled "Preventing Cryptosporidiosis: A Guide to Water Filters and Bottled Water," available by visiting http://www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/factsht_crypto_prevent_water.htm.

Avoid food that might be contaminated.

1. Wash and/or peel all raw vegetables and fruits before eating.
2. Use safe, uncontaminated water to wash all food that is to be eaten raw.
3. Avoid eating uncooked foods when traveling in countries with minimal water treatment and sanitation systems.

Avoid fecal exposure during sexual activity.

If my water comes from a well, should I have my well water tested?

You should consider having your well water tested if you can answer "yes" to any of the following questions:

- **Are members of your family or others who use your well water becoming ill?** If yes, your well may be the source of infection.
- **Is your well located at the bottom of a hill or is it considered shallow?** If so, runoff from rain or flood water may be draining directly into your well causing contamination.
- **Is your well in a rural area where animals graze?** Well water can become contaminated with feces if animal waste seepage contaminates the ground water. This can occur if your well has cracked casings, is poorly constructed, or is too shallow.

Tests used to specifically identify *Giardia* are often expensive, difficult, and usually require hundreds of gallons of water to be pumped through a filter. If you answered "yes" to the above questions, consider generally testing your well for fecal contamination by testing it for the presence of coliforms or *E. coli* instead of *Giardia*. Although tests for fecal coliforms or *E. coli* do not specifically tell you whether *Giardia* is present, these tests will show whether your well water has been contaminated by fecal matter.

These tests are only useful if your well is not routinely disinfected with chlorine, since chlorine kills fecal coliforms and *E. coli*. If the tests are positive, it is possible that the water may also be contaminated with *Giardia* or other harmful bacteria and viruses. Contact your county health department, your county cooperative extension service, or a local laboratory to find out who offers water testing in your area. If the fecal coliform test comes back positive, indicating that your well is fecally contaminated, discontinue drinking the well water and contact your local water authority for instructions on how to disinfect your well.

This fact sheet is for information only and is not meant to be used for self-diagnosis or as a substitute for consultation with a health care provider. If you have any questions about the disease described above or think that you may have a parasitic infection, consult a health care provider.

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Q&A about *E. coli* measured in Katrina flood waters

What is E. coli?

E. coli is a strain of bacteria that lives in the intestines of humans and animals and is normally found in all streams, lakes and canals. The vast majority of strains of *E. coli* are harmless. There are some strains such as *E. coli* O157:H7 that are harmful and can produce a toxin that causes severe illness.

What strains of E. coli have been found in the flood waters caused by Hurricane Katrina?

The *E. coli* bacteria that were measured in flood waters after Hurricane Katrina are not the strain that causes disease. They are the harmless bacteria that exist in the intestines of all people and animals. These are called generic *E. coli*. These studies did not find *E. coli* O157, a harmful bacteria, in the waters.

How did the E. coli get into the flood waters?

Generic *E. coli* is normally found in all streams, lakes and canals. When there is flooding along with a hurricane, the waters may contain fecal material from overflowing sewage systems and agricultural and industrial waste. It is likely that there are also disease- causing organisms in such contaminated water.

What can be done to prevent infection from water contaminated with sewage?

- Leave the flooded zone
- Avoid swallowing contaminated water
- Drink municipal or bottled water that has been treated with chlorine or other effective disinfectants. If bottled water is not available, boil water before drinking, washing, or using to brush teeth. More information on keeping food and water safe can be found at http://www.bt.cdc.gov/disasters/foodwater.asp.
- Wash hands and feet that have been in contact with the contaminated water appropriately with soap and clean water. If soap and clean water are not available, use an alcohol-based hand rub to clean hands. More information on washing hands can be found at http://www.bt.cdc.gov/disasters/illness.asp#handwash.
- If there has been a backflow of sewage into your house, wear rubber boots and waterproof gloves during cleanup. Remove and discard contaminated household materials that cannot be disinfected such as wall coverings, cloth, rugs, and drywall.
- If you have any open cuts or sores that will be exposed to floodwater, keep them as clean as possible by washing them with soap and clean water applying an antibiotic ointment to discourage infection.
- Wash clothes contaminated with flood or sewage water in hot water and detergent and separately from uncontaminated clothes and linens.
- Do not allow children to play in floodwater areas and do not allow children to play with floodwater-contaminated toys that have not been disinfected. Disinfect toys using a solution of one cup of bleach in five gallons of water.

More details about keeping food and water safe after a natural disaster are at http://www.bt.cdc.gov/disasters/foodwater.asp.

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Q&A about *E. coli* measured in Katrina flood waters
(continued from previous page)

What should I do if I or someone I am caring for has been exposed to sewage contaminated waters?

They may have been exposed to disease causing germs. They should take a bath or shower with clean water and soap, and clean there clothes and other belongings as described above. If wounds were exposed to the sewage contaminated floodwaters, clean and treat them as described above, watch their health status, and if they develop diarrhea, vomiting or fever, give them extra fluids to drink and seek medical evaluation.

For more information, please see:

E. coli Infection (http://www.cdc.gov/ncidod/dbmd/diseaseinfo/escherichiacoli_g.htm)

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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FAQ for Hurricane Katrina and Leptospirosis

What is leptospirosis?

Leptospirosis is an infection of both humans and animals. It is caused by bacteria called Leptospira. In humans it causes a wide range of symptoms. Some infected persons may have no symptoms. Others may have high fever, severe headache, and muscle aches. In severe cases, people may have jaundice (yellow skin and eyes) from liver failure. Severe disease may also cause kidney damage and respiratory distress. In rare cases death occurs.

Many of these symptoms can be mistaken for other diseases. Leptospirosis is confirmed by testing of a blood or urine sample.

How do people get leptospirosis?

People get leptospirosis from exposure to infected animals. They can also be infected when exposed to water contaminated with the urine of infected animals.

Many different kinds of animals carry Leptospira. Animals may carry the bacterium but have no symptoms. Leptospira have been found in cattle, pigs, horses, dogs, rodents, and wild animals. The disease is not spread from person to person.

In Louisiana, leptospirosis occurs in cattle, skunks, and nutria (large rodents). Urban leptospirosis caused by exposure to rats occurs in the U.S.

How long is it between the time of exposure and when people become sick?

People may develop symptoms from 2 days to 4 weeks after exposure. Illness usually begins abruptly with fever. Leptospirosis may occur in two phases. In the first phase, fever, chills, headache, muscle aches, vomiting, and diarrhea, are common. The patient may get better for a time but become ill again. If a second phase occurs, it is usually more severe. Severely ill person may develop kidney or liver failure.

The illness lasts from a few days to 3 weeks or longer. Without treatment, recovery may take several months.

Where is leptospirosis found?

Leptospirosis occurs worldwide but is most common in tropical climates. Many people who work outdoors or with animals may be at risk. People exposed to urine-contaminated water during work or recreation may also be at risk.

Between 1965 and 1993, the incidence rate of leptospirosis in Louisiana ranged from 1 to 14 per 100,000 people per year.

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How is leptospirosis treated?

Leptospirosis is treated with antibiotics. Doxycycline or penicillin are usually used. Treatment is most effective when given early in the course of disease. Intravenous antibiotics may be used for severe disease. Persons with symptoms suggestive of leptospirosis should contact a health care provider.

Can leptospirosis be prevented?

The risk of getting leptospirosis can be reduced by avoiding contact with urine-contaminated water. Protective clothing and footwear should be worn if exposure to urine-contaminated water is unavoidable.

What is the risk of leptospirosis along the Gulf Coast after hurricane Katrina?

Outbreaks of leptospirosis have occurred following flood events. Leptospirosis cases may occur in the days to weeks following Hurricane Katrina.

Persons exposed to flood waters from Hurricane Katrina who develop fever should see a healthcare provider.

For more information on leptospirosis, please see:

- Leptospirosis Resources (http://www.cdc.gov/ncidod/dbmd/diseaseinfo/leptospirosis_g.htm)

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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FACT SHEET

Vibrio vulnificus

What is *Vibrio vulnificus*?

Vibrio vulnificus is a bacterium that is a rare cause of illness in the United States. The illness is very different from cholera, which is caused by different bacteria, called *Vibrio cholerae. V. vulnificus* infections do not spread directly from one person to another and are a serious health threat predominantly to persons with underlying illness, such as liver disease, or a compromised immune system. The organism is a natural inhabitant of warm coastal waters. Infection can occur after a wound is exposed to warm coastal waters where the *V. vulnificus* organism is growing. Infection may also be acquired by eating raw or undercooked seafood from those waters.

CDC receives reports of over 400 *Vibrio* illnesses each year. Of those, about 90 per year are due to *V. vulnificus*. Most *V. vulnificus* illness occurs during warm-weather months.

Symptoms of infection with *V. vulnificus*

- Acute illness, with a rapid decline in health following exposure
- If exposed by contamination of an open wound, increasing swelling, redness, and pain at the site of the wound
- Illness typically begins within 1-3 days of exposure, but begins as late as 7 days after exposure for a small percentage of cases
- Fever
- Swelling and redness of skin on arms or legs, with blood-tinged blisters
- Low blood pressure and shock

By contrast, the symptoms of cholera are profuse watery diarrhea, vomiting, cramps, and low-grade fever.

Illness caused by *V. vulnificus*

Wound infections may start as redness and swelling at the site of the wound that then can progress to affect the whole body. *V. vulnificus* typically causes a severe and life-threatening illness characterized by fever and chills, decreased blood pressure (septic shock), and blood-tinged blistering skin lesions (hemorrhagic bullae). Overall, *V. vulnificus* infections are fatal about 40% of the time. Wound infections with *V. vulnificus* are fatal about 20% of the time, and aggressive surgical treatment can prevent death.

How people become infected

V. vulnificus is found in oysters and other shellfish in warm coastal waters during the summer months. Since it is naturally found in warm marine waters, people with open wounds can be exposed to *V. vulnificus* through direct contact with seawater, shellfish, and marine wildlife. There is no evidence of person-to-person transmission of *V. vulnificus*.

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Persons who have immunocompromising conditions and especially persons with chronic liver disease are particularly at risk for *V. vulnificus* infection when they eat raw or undercooked seafood, particularly shellfish harvested from the Gulf of Mexico, or if they bathe a cut or scrape in marine waters. About three-quarters of patients with *V. vulnificus* infections have known underlying hepatic disease or other immunocompromising illness. Otherwise healthy persons are at much lower risk of *V. vulnificus* infection.

Concerns in hurricane-affected areas

Persons with immunocompromising conditions and especially those with chronic liver disease should avoid exposure of open wounds or broken skin to warm salt or brackish water, and avoid consuming undercooked shellfish harvested from such waters. More information on caring for wounds may be found in the fact sheet "Emergency Wound Care After a Natural Disaster" available on the CDC Hurricanes website at http://www.bt.cdc.gov/disasters/woundcare.asp.

After a coastal flood disaster, large numbers of persons with illnesses that affect their resistance to infection may be exposed to seawater. Injury prevention is especially important for high-risk persons. Wounds exposed to seawater should be washed with soap and water as soon as possible, infected wounds should be seen by a doctor, and clinicians should aggressively monitor these wounds.

Diagnosis

V. vulnificus infection is diagnosed by microbiologic culture of wound, by blood cultures, or by stool culture in the case of patients who consumed raw or undercooked seafood.

Treatment

V. vulnificus infection is treated with antibiotics. When this infection is suspected, treatment with a combination of a third-generation cephalosporin (e.g., ceftazidime) and doxycycline is recommended. *V. vulnificus* wound infections should be treated with aggressive attention to the wound site; amputation of the affected limb is sometimes necessary.

Recovery

V. vulnificus infection is an acute illness, and those who recover should not expect long-term consequences.

Information about *Vibrio* surveillance may be found at http://www.cdc.gov/foodborneoutbreaks/vibrio_sum.htm.

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION
SAFER • HEALTHIER • PEOPLE™

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Buffalo District

Site Contents

Surveillance Programs

- NREVSS

Disease Information

- Measles
- Viral Gastroenteritis
  - Rotavirus
  - Norovirus
- Non-Polio Enterovirus
  - Viral Meningitis
  - Hand, Foot, and Mouth Disease
- Parvovirus B19 (Fifth Disease)
  - B19 and Pregnancy
- Adenovirus
- Human Parainfluenza
- Respiratory Syncytial Virus

Related links

- Severe Acute Respiratory Syndrome (SARS)

Non-Polio Enterovirus Infections

What are enteroviruses?

Enteroviruses are small viruses that are made of ribonucleic acid (RNA) and protein. This group includes the polioviruses, coxsackieviruses, echoviruses, and other enteroviruses. In addition to the three different polioviruses, there are 62 non-polio enteroviruses that can cause disease in humans: 23 Coxsackie A viruses, 6 Coxsackie B viruses, 28 echoviruses, and 5 other enteroviruses.

How common are infections with these viruses?

Non-polio enteroviruses are very common. They are second only to the "common cold" viruses, the rhinoviruses, as the most common viral infectious agents in humans. The enteroviruses cause an estimated 10-15 million or more symptomatic infections a year in the United States. All three types of polioviruses have been eliminated from the Western Hemisphere, as well as Western Pacific and European regions, by the widespread use of vaccines.

Who is at risk of infection and illness from these viruses?

Everyone is at risk of infection. Infants, children, and adolescents are more likely to be susceptible to infection and illness from these viruses, because they are less likely to have antibodies and be immune from previous exposures to them, but adults can also become infected and ill if they do not have immunity to a specific enterovirus.

How does someone become infected with one of these viruses?

Enteroviruses can be found in the respiratory secretions (e.g., saliva, sputum, or nasal mucus) and stool of an infected person. Other persons may become infected by direct contact with secretions from an infected person or by contact with contaminated surfaces or objects, such as a drinking glass or telephone. Parents, teachers, and child care center workers may also become infected by contamination of the hands with stool from an infected infant or toddler during diaper changes.

What time of year is someone at risk for infection/illness?

In the United States, infections caused by the enteroviruses are most likely to occur during the summer and fall.

What illnesses do these viruses cause?

Most people who are infected with an enterovirus have no disease at all. Infected persons who become ill usually develop either mild upper respiratory symptoms (a "summer cold"), a flu-like illness with fever and muscle aches, or an illness with rash. Less commonly, some persons have "aseptic" or viral meningitis. Rarely, a person may develop an illness that affects the heart (myocarditis) or the brain (encephalitis) or causes paralysis. Enterovirus infections are suspected to play a role in the development of juvenile-onset diabetes mellitus (sugar diabetes). Newborns infected with an enterovirus may rarely develop severe illness and die from infection (see below: "What are the risks of enterovirus infections in pregnancy?").

Are there any long-term complications from these illnesses?

Usually, there are no long-term complications from the mild illnesses or from "aseptic" meningitis. Some patients who have paralysis or encephalitis, however, do not fully recover. Persons who develop heart failure (dilated cardiomyopathy) from myocarditis require long-term care for their conditions.

What are the risks of enterovirus infections in pregnancy?

Because enteroviruses are very common, pregnant women are frequently exposed to them, especially during summer and fall months. As for any other adults, the risk of infection is higher for pregnant women who do not have antibodies from earlier exposures to enteroviruses currently circulating in the community, and are exposed to young children - the primary spreaders of these viruses.

Most enterovirus infections during pregnancy cause mild or no illness in the mother. Although the available information is limited, currently there is no clear evidence that maternal enteroviral infection causes adverse outcomes of pregnancy such as abortion, stillbirth, or congenital defects. However, mothers infected shortly before delivery, may pass the virus to the newborn. Babies born to mothers who have symptoms of enteroviral illness around the time of delivery are more likely to be infected. Newborns

infected with an enterovirus usually have mild illness, but rarely they may develop an overwhelming infection of many organs, including liver and heart, and die from the infection. The risk of this severe illness is higher for the newborns infected during the first two weeks of life.

Strict adherence to generally recommended good hygienic practices (see "Can these infections be prevented?" below) by pregnant women may help to decrease the risk of infection during pregnancy and around the time of delivery.

What are the health care costs of these infections?

The health care costs from enterovirus infections are unknown, but a large portion of the costs may come from use of over-the-counter medications to treat symptoms for millions of cases of "summer colds" and "flu" caused by enteroviruses. There are also significant costs associated with the 25,000 to 50,000 hospitalizations for "aseptic" meningitis each year in the United States.

Are these infections more severe in some years than in others?

There are no predictable patterns of circulation of these viruses or of diseases such as "aseptic" meningitis. There are occasional national or regional outbreaks of "aseptic" meningitis, such as the echovirus 30 outbreaks in the United States between 1989 and 1992 and in 2003, and echovirus 13 and echovirus 18 outbreaks in 2001. However, there is significant yearly variation, and no long-term trends have been identified.

Can these infections be prevented?

No vaccine is currently available for the non-polio enteroviruses. Because most persons who are infected with enteroviruses do not become sick, it can be difficult to prevent the spread of the virus. General cleanliness and frequent handwashing are probably effective in reducing the spread of these viruses (see "Handwashing" in: "An Ounce of Prevention: Keeps the Germs Away" at http://www.cdc.gov/ncidod/op/handwashing.htm). Also, cleaning contaminated surfaces and soiled articles first with soap and water, and then disinfecting them with a dilute solution of chlorine-containing bleach (made by mixing approximately ¼ cup of bleach with 1 gallon of water) can be a very effective way to inactivate the virus, especially in institutional settings such as child care centers. (See more about cleaning and disinfecting in general at http://www.cdc.gov/ncidod/op/cleaning.htm).

Do CDC and state health departments keep track of these viruses?

State health department laboratories report to CDC the enteroviruses they identify by testing specimens from patients. "Aseptic" meningitis is no longer a nationally notifiable disease in the United States. Other forms of meningitis and poliomyelitis are notifiable, which means that any doctor or laboratory that diagnoses a case must report it to the public health department.

For more information on enterovirus infections see:

Viral ("Aseptic") Meningitis
Hand, Foot, and Mouth Disease

Need additional information? Click here.

This page was last reviewed on January 24, 2005

Centers for Disease Control and Prevention
National Center for Infectious Diseases

Occupational Hazards

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How to Protect Yourself and Others from Electrical Hazards Following a Natural Disaster

After a hurricane, flood or other natural disaster you need to be careful to avoid electrical hazards both in your home and elsewhere.

- *Never* touch a fallen power line. Call the power company to report fallen power lines.
- Avoid contact with overhead power lines during cleanup and other activities.
- Do not drive through standing water if downed powerlines are in the water.
- If a powerline falls across your car while you are driving, stay inside the vehicle and continue to drive away from the line. If the engine stalls, do not turn off the ignition. Warn people not to touch the car or the line. Call or ask someone to call the local utility company and emergency services. Do not allow anyone other than emergency personnel to approach your vehicle.
- If electrical circuits and electrical equipment have gotten wet or are in or near water, turn off the power at the main breaker or fuse on the service panel. If you must enter standing water to access the main power switch, then call an electrician to turn it off.
- Never turn power on or off yourself or use an electric tool or appliance while standing in water. Do not turn the power back on until electrical equipment has been inspected by a qualified electrician. All electrical equipment and appliances must be completely dry before returning them to service. Have a certified electrician check these items if there is any question.
- If you see frayed wiring or sparks when you restore power, or if there is an odor of something burning but no visible fire, you should immediately shut off the electrical system at the main circuit breaker.
- Consult your utility company about using electrical equipment, including power generators. Do not connect generators to your home's electrical circuits without the approved, automatic-interrupt devices. If a generator is on line when electrical service is restored, it can become a major fire hazard and it may endanger line workers helping to restore power in your area.

If you believe someone has been electrocuted take the following steps:

1. Look first. Don't touch. The person may still be in contact with the electrical source. Touching the person may pass the current through you.
2. Call or have someone else call 911 or emergency medical help.
3. Turn off the source of electricity if possible. If not, move the source away from you and the affected person using a nonconducting object made of cardboard, plastic or wood.
4. Once the person is free of the source of electricity, check the person's breathing and pulse. If either has stopped or seems dangerously slow or shallow, begin cardiopulmonary resuscitation (CPR) immediately.
5. If the person is faint or pale or shows other signs of shock, lay him or her down with the head slightly lower than the trunk of the body and the legs elevated.
6. Don't touch burns, break blisters, or remove burned clothing. Electrical shock may cause burns inside the body, so be sure the person is taken to a doctor.

For more information, visit www.bt.cdc.gov/disasters/hurricanes,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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CARBON MONOXIDE POISONING

Protect Yourself from Carbon Monoxide Poisoning After an Emergency

Never use generators, grills, camp stoves, or other gasoline, propane, natural gas, or charcoal-burning devices inside your home, basement, garage, or camper—or even outside near an open window.

Carbon monoxide (CO) is an odorless, colorless gas that can cause sudden illness and death if you breathe it. When power outages occur during emergencies such as hurricanes or winter storms, you may try to use alternative sources of fuel or electricity for heating, cooling, or cooking. CO from these sources can build up in your home, garage, or camper and poison the people and animals inside.

If you are too hot or too cold, or you need to prepare food, don't put yourself and your family at risk—look to friends or a community shelter for help. If you must use an alternative source of fuel or electricity, be sure to use it only outside and away from open windows.

Every year, more than 500 people die from accidental CO poisoning. CO is found in combustion fumes, such as those produced by small gasoline engines, stoves, generators, lanterns, and gas ranges, or by burning charcoal and wood. CO from these sources can build up in enclosed or partially enclosed spaces.

People and animals in these spaces can be poisoned and can die from breathing CO in an enclosed or partially enclosed space.

How to Recognize CO Poisoning

Exposure to CO can cause loss of consciousness and death. The most common symptoms of CO poisoning are headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion. People who are sleeping or who have been drinking alcohol can die from CO poisoning before ever having symptoms. If you think you may have CO poisoning, consult a health care professional right away.

Important Tips

- Never use a gas range or oven to heat a home.
- Never use a charcoal grill, hibachi, lantern, or portable camping stove inside a home, tent, or camper.
- Never run a generator, pressure washer, or any gasoline-powered engine inside a basement, garage, or other enclosed structure, even if the doors or windows are open, unless the equipment is professionally installed and vented. Keep vents and flues free of debris, especially if winds are high. Flying debris can block ventilation lines.
- Never run a motor vehicle, generator, pressure washer, or any gasoline-powered engine outside an open window or door where exhaust can vent into an enclosed area.
- Never leave the motor running in a vehicle parked in an enclosed or partially enclosed space, such as a closed garage.

For more information, visit www.bt.cdc.gov
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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Protect Yourself from Animal- and Insect-Related Hazards After a Natural Disaster

General

- Avoid wild or stray animals.
- Call local authorities to handle animals.
- Secure all food sources and remove any animal carcasses to avoid attracting rats.
- Get rid of dead animals, according to guidelines from your local animal control authority, as soon as you can. See Animal Disposal (http://www.bt.cdc.gov/disasters/animaldisposal.asp) for answers to frequently asked questions.
- For more information, contact your local animal shelter or services, a veterinarian, or the Humane Society for advice on dealing with pets or stray or wild animals after an emergency. Also see Resources for Planning How to Protect Your Pets in an Emergency (http://www.bt.cdc.gov/disasters/petprotect.asp).

Avoid Mosquitoes

- Rain and flooding in a hurricane area may lead to an increase in numbers of mosquitoes, which can carry diseases such as West Nile virus or dengue fever. In most cases, the mosquitoes will be pests but will not carry communicable diseases. Local, state, and federal public health authorities will be actively working to control the spread of any mosquito-borne diseases. For more information on West Nile virus, see CDC's West Nile virus Web site (http://www.cdc.gov/ncidod/dvbid/westnile/).
- To protect yourself from mosquitoes, use screens on dwellings; wear long pants, socks, and long-sleeved shirts; and use insect repellents that contain DEET or Picaridin. Follow directions on the product label and take care when using DEET on small children. More information about these and other recommended repellents can be found in the fact sheet Updated Information Regarding Insect Repellents (http://www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm).
- To help control mosquito populations, drain all standing water left outdoors in open containers, such as flower pots, tires, pet dishes, or buckets.

Prevent or Respond to a Snake Bite

- Be aware of snakes that may be swimming in the water to get to higher ground and those that may be hiding under debris or other objects.
- If you see a snake, back away from it slowly and do not touch it.
- If you or someone you know are bitten, try to see and remember the color and shape of the snake, which can help with treatment of the snake bite.
- Keep the bitten person still and calm. This can slow down the spread of venom if the snake is poisonous. Seek medical attention as soon as possible. Dial 911 or call local Emergency Medical Services. Apply first aid if you can not get the person to the hospital right away.
    - Lay or sit the person down with the bite below the level of the heart.
    - Tell him/her to stay calm and still.
    - Cover the bite with a clean, dry dressing.

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For more information, see How to Prevent or Respond to a Snake Bite (http://www.bt.cdc.gov/disasters/snakebite.asp).

For more information, see the following:

- **Centers for Disease Control and Prevention**
  - Avoid Contact with Wild Animals (http://www.cdc.gov/ncidod/op/animals.htm)
  - Dog Bite Prevention (http://www.cdc.gov/ncipc/duip/biteprevention.htm)
  - Healthy Pets, Healthy People (http://www.cdc.gov/healthypets/)
  - Rabies Web Site (http://www.cdc.gov/ncidod/dvrd/rabies/)
  - Rat-Bite Fever: Frequently Asked Questions (http://www.cdc.gov/ncidod/dbmd/diseaseinfo/ratbitefever_g.htm)
- **American Veterinary Association**
  - Dog Bite Prevention Message Points (http://www.avma.org/press/publichealth/dogbite/messpoints.asp)
  - Education Resources for Dog Bite Prevention (http://www.cdc.gov/ncipc/duip/biteprevention.htm)
- **Texas A&M University**
  - Medical Problems and Treatment Considerations for the Red Imported Fire Ant (http://fireant.tamu.edu/materials/factsheets/FAPFS023.2002rev.Medical.pdf)

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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Protect Yourself from Mold

After natural disasters such as hurricanes, tornadoes, and floods, excess moisture and standing water contribute to the growth of mold in homes and other buildings. When returning to a home that has been flooded, be aware that mold may be present and may be a health risk for your family.

People at Greatest Risk from Mold

People with asthma, allergies, or other breathing conditions may be more sensitive to mold. People with immune suppression (such as people with HIV infection, cancer patients taking chemotherapy, and people who have received an organ transplant) are more susceptible to mold infections.

Possible Health Effects of Mold Exposure

People who are sensitive to mold may experience stuffy nose, irritated eyes, wheezing, or skin irritation. People allergic to mold may have difficulty in breathing and shortness of breath. People with weakened immune systems and with chronic lung diseases, such as obstructive lung disease, may develop mold infections in their lungs. If you or your family members have health problems after exposure to mold, contact your doctor or other health care provider.

Recognizing Mold

You *may* recognize mold by:

- **Sight** (Are the walls and ceiling discolored, or do they show signs of mold growth or water damage?)
- **Smell** (Do you smell a bad odor, such as a musty, earthy smell or a foul stench?)

Safely Preventing Mold Growth

Clean up and dry out the building quickly (within 24 to 48 hours). Open doors and windows. Use fans to dry out the building. (See the fact sheet for drying out your house, Reentering Your Flooded Home (http://www.bt.cdc.gov/disasters/mold/reenter.asp)).

- **When in doubt, take it out!** Remove all porous items that have been wet for more than 48 hours and that cannot be thoroughly cleaned and dried. These items can remain a source of mold growth and should be removed from the home. Porous, noncleanable items include carpeting and carpet padding, upholstery, wallpaper, drywall, floor and ceiling tiles, insulation material, clothing, leather, paper, wood, and food. Removal and cleaning are important because even dead mold may cause allergic reactions in some people.
- To *prevent* mold growth, clean wet items and surfaces with detergent and water.
- Homeowners may want to temporarily store items outside of the home until insurance claims can be filed. See recommendations by the Federal Emergency Management Agency (FEMA) (http://www.fema.gov/hazards/floods/whatshouldidoafter.shtm).

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Protect Yourself from Mold
(continued from previous page)

- If you wish to disinfect, refer to the U.S. Environmental Protection Agency (EPA) document, *A Brief Guide to Mold and Moisture in Your Home* at http://www.epa.gov/iaq/molds/images/moldguide.pdf.

If there is mold growth in your home, you should clean up the mold *and* fix any water problem, such as leaks in roofs, walls, or plumbing. Controlling moisture in your home is the most critical factor for preventing mold growth.

To *remove* mold growth from hard surfaces use commercial products, soap and water, or a bleach solution (http://www.cdc.gov/mold/faqs.htm) of 1 cup of bleach in 1 gallon of water. Use a stiff brush on rough surface materials such as concrete.

If you choose to use bleach to remove mold:

- Never mix bleach with ammonia. Mixing bleach and ammonia can produce dangerous, toxic fumes.
- Open windows and doors to provide fresh air.
- Wear non-porous gloves and protective eye wear.
- If the area to be cleaned is more than 10 square feet, consult the U.S. Environmental Protection Agency (EPA) guide titled *Mold Remediation in Schools and Commercial Buildings*. Although focused on schools and commercial buildings, this document also applies to other building types. You can get it free by calling the EPA Indoor Air Quality Information Clearinghouse at (800) 438-4318, or by going to the EPA web site at http://www.epa.gov/mold/mold_remediation.html.
- Always follow the manufacturer's instructions when using bleach or any other cleaning product.
- More information on personal safety while cleaning up after a natural disaster is available at http://www.bt.cdc.gov/disasters/workers.asp.

For more information on mold, visit CDC's Mold Web site at http://www.cdc.gov/mold/.

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After a Flood

Precautions When Returning to Your Home

Electrical power and natural gas or propane tanks should be shut off to avoid fire, electrocution, or explosions. Try to return to your home during the daytime so that you do not have to use any lights. Use battery-powered flashlights and lanterns, rather than candles, gas lanterns, or torches. If you smell gas or suspect a leak, turn off the main gas valve, open all windows, and leave the house immediately. Notify the gas company or the police or fire departments or State Fire Marshal's office, and do not turn on the lights or do anything that could cause a spark. Do not return to the house until you are told it is safe to do so.

Your electrical system may also be damaged. If you see frayed wiring or sparks, or if there is an odor of something burning but no visible fire, you should immediately shut off the electrical system at the circuit breaker.

Avoid any downed power lines, particularly those in water. Avoid wading in standing water, which also may contain glass or metal fragments.

You should consult your utility company about using electrical equipment, including power generators. Be aware that it is against the law and a violation of electrical codes to connect generators to your home's electrical circuits without the approved, automatic-interrupt devices. If a generator is on line when electrical service is restored, it can become a major fire hazard. In addition, the improper connection of a generator to your home's electrical circuits may endanger line workers helping to restore power in your area. All electrical equipment and appliances must be completely dry before returning them to service. It is advisable to have a certified electrician check these items if there is any question. Also, remember not to operate any gas-powered equipment indoors. (See also "Carbon Monoxide Poisoning" at www.bt.cdc.gov/disasters/carbonmonoxide.asp.)

See also "Reentering Your Flooded Home" at www.bt.cdc.gov/disasters/mold/reenter.asp.

Cleanup

Walls, hard-surfaced floors, and many other household surfaces should be cleaned with soap and water and disinfected with a solution of 1 cup of bleach to five gallons of water. Be particularly careful to thoroughly disinfect surfaces that may come in contact with food, such as counter tops, pantry shelves, refrigerators, etc. Areas where small children play should also be carefully cleaned. Wash all linens and clothing in hot water, or dry clean them. For items that cannot be washed or dry cleaned, such as mattresses and upholstered furniture, air dry them in the sun and then spray them thoroughly with a disinfectant. Steam clean all carpeting. If there has been a backflow of sewage into the house, wear rubber boots and waterproof gloves during cleanup. Remove and discard contaminated household materials that cannot be disinfected, such as wallcoverings, cloth, rugs, and drywall.

See also "Protect Yourself from Mold" at www.bt.cdc.gov/disasters/mold/protect.asp.

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Immunizations

Outbreaks of communicable diseases after floods are unusual. However, the rates of diseases that were present before a flood may increase because of decreased sanitation or overcrowding among displaced persons. Increases in infectious diseases that were not present in the community before the flood are not usually a problem. If you receive a puncture wound or a wound contaminated with feces, soil, or saliva, have a doctor or health department determine whether a tetanus booster is necessary based on individual records.

Specific recommendations for vaccinations should be made on a case-by-case basis, or as determined by local and state health departments.

Swiftly Flowing Water

If you enter swiftly flowing water, you risk drowning -- regardless of your ability to swim. Swiftly moving shallow water can be deadly, and even shallow standing water can be dangerous for small children. Cars or other vehicles do not provide adequate protection from flood waters. Cars can be swept away or may break down in moving water.

Chemical Hazards

Use extreme caution when returning to your area after a flood. Be aware of potential chemical hazards you may encounter during flood recovery. Flood waters may have buried or moved hazardous chemical containers of solvents or other industrial chemicals from their normal storage places.

If any propane tanks (whether 20-lb. tanks from a gas grill or household propane tanks) are discovered, do not attempt to move them yourself. These represent a very real danger of fire or explosion, and if any are found, police or fire departments or your State Fire Marshal's office should be contacted immediately.

Car batteries, even those in flood water, may still contain an electrical charge and should be removed with extreme caution by using insulated gloves. Avoid coming in contact with any acid that may have spilled from a damaged car battery.

For more information, visit www.bt.cdc.gov
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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Protect Yourself from Animal- and Insect-Related Hazards After a Natural Disaster

General

- Avoid wild or stray animals.
- Call local authorities to handle animals.
- Secure all food sources and remove any animal carcasses to avoid attracting rats.
- Get rid of dead animals, according to guidelines from your local animal control authority, as soon as you can. See Animal Disposal (http://www.bt.cdc.gov/disasters/animaldisposal.asp) for answers to frequently asked questions.
- For more information, contact your local animal shelter or services, a veterinarian, or the Humane Society for advice on dealing with pets or stray or wild animals after an emergency. Also see Resources for Planning How to Protect Your Pets in an Emergency (http://www.bt.cdc.gov/disasters/petprotect.asp).

Avoid Mosquitoes

- Rain and flooding in a hurricane area may lead to an increase in numbers of mosquitoes, which can carry diseases such as West Nile virus or dengue fever. In most cases, the mosquitoes will be pests but will not carry communicable diseases. Local, state, and federal public health authorities will be actively working to control the spread of any mosquito-borne diseases. For more information on West Nile virus, see CDC's West Nile virus Web site (http://www.cdc.gov/ncidod/dvbid/westnile/).
- To protect yourself from mosquitoes, use screens on dwellings; wear long pants, socks, and long-sleeved shirts; and use insect repellents that contain DEET or Picaridin. Follow directions on the product label and take care when using DEET on small children. More information about these and other recommended repellents can be found in the fact sheet Updated Information Regarding Insect Repellents (http://www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm).
- To help control mosquito populations, drain all standing water left outdoors in open containers, such as flower pots, tires, pet dishes, or buckets.

Prevent or Respond to a Snake Bite

- Be aware of snakes that may be swimming in the water to get to higher ground and those that may be hiding under debris or other objects.
- If you see a snake, back away from it slowly and do not touch it.
- If you or someone you know are bitten, try to see and remember the color and shape of the snake, which can help with treatment of the snake bite.
- Keep the bitten person still and calm. This can slow down the spread of venom if the snake is poisonous. Seek medical attention as soon as possible. Dial 911 or call local Emergency Medical Services. Apply first aid if you can not get the person to the hospital right away.
    - Lay or sit the person down with the bite below the level of the heart.
    - Tell him/her to stay calm and still.
    - Cover the bite with a clean, dry dressing.

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For more information, see How to Prevent or Respond to a Snake Bite (http://www.bt.cdc.gov/disasters/snakebite.asp).

For more information, see the following:

- **Centers for Disease Control and Prevention**
  - Avoid Contact with Wild Animals (http://www.cdc.gov/ncidod/op/animals.htm)
  - Dog Bite Prevention (http://www.cdc.gov/ncipc/duip/biteprevention.htm)
  - Healthy Pets, Healthy People (http://www.cdc.gov/healthypets/)
  - Rabies Web Site (http://www.cdc.gov/ncidod/dvrd/rabies/)
  - Rat-Bite Fever: Frequently Asked Questions (http://www.cdc.gov/ncidod/dbmd/diseaseinfo/ratbitefever_g.htm)
- **American Veterinary Association**
  - Dog Bite Prevention Message Points (http://www.avma.org/press/publichealth/dogbite/messpoints.asp)
  - Education Resources for Dog Bite Prevention (http://www.cdc.gov/ncipc/duip/biteprevention.htm)
- **Texas A&M University**
  - Medical Problems and Treatment Considerations for the Red Imported Fire Ant (http://fireant.tamu.edu/materials/factsheets/FAPFS023.2002rev.Medical.pdf)

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Industrial Hygenist Buffalo District

How to Prevent or Respond to a Snake Bite

After a natural disaster, snakes may have been forced from their natural habitats and move into areas where they would not normally be seen or expected. When you return to your home, be cautious of snakes that may have sought shelter in your home. If you see a snake in your home immediately call the animal control agency in your county.

How to prevent snake bites.

- Be aware of snakes that may be swimming in the water to get to higher ground and those that may be hiding under debris or other objects.
- If you see a snake, back away from it slowly and do not touch it.

Signs of snake bites.

If you have to walk in high water, you may feel a bite, but not know that you were bitten by a snake. You may think it is another kind of bite or scratch. Pay attention to the following snake bite signs.

Depending on the type of snake, the signs and symptoms may include:

- A pair of puncture marks at the wound;
- Redness and swelling around the bite;
- Severe pain at the site of the bite;
- Nausea and vomiting;
- Labored breathing (in extreme cases, breathing may stop altogether);
- Disturbed vision;
- Increased salivation and sweating.
- Numbness or tingling around your face and/or limbs.

What to DO if you or someone else is bitten by a snake.

- If you or someone you know are bitten, try to see and remember the color and shape of the snake, which can help with treatment of the snake bite.
- Keep the bitten person still and calm. This can slow down the spread of venom if the snake is poisonous.
- Seek medical attention as soon as possible.
- Dial 911 or call local Emergency Medical Services (EMS).
- Apply first aid if you can not get the person to the hospital right away.
    - Lay or sit the person down with the bite below the level of the heart.
    - Tell him/her to stay calm and still.
    - Cover the bite with a clean, dry dressing.

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How to Prevent or Respond to a Snake Bite
(continued from previous page)

What NOT to do if you or someone else is bitten by a snake.

- Do not pick up the snake or try to trap it (this may put you or someone else at risk for a bite).
- Do not apply a tourniquet.
- Do not slash the wound with a knife.
- Do not suck out the venom.
- Do not apply ice or immerse the wound in water.
- Do not drink alcohol as a pain killer.
- Do not drink caffeinated beverages.

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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FACT SHEET

Key Facts About Hurricane Recovery:
Protect Your Health and Safety After a Hurricane

Prevent illness from FOOD

Identify and throw away food that may not be safe to eat. Throw away food that may have come in contact with flood or storm water. Throw away canned foods that are bulging, opened, or damaged. Throw away food that has an unusual odor, color, or texture. Throw away perishable foods (including meat, poultry, fish, eggs and leftovers) that have been above 40 degrees Fahrenheit (F) for 2 hours or more. Thawed food that contains ice crystals or is 40 degree F or below can be refrozen or cooked. If cans have come in contact with floodwater or storm water, remove the labels, wash the cans, and dip them in a solution of 1 cup of bleach in 5 gallons of water. Relabel the cans with a marker.

Store food safely. While the power is out, keep the refrigerator and freezer doors closed as much as possible. Add block ice or dry ice to your refrigerator if the electricity is expected to be off longer than 4 hours. Wear heavy gloves when handling ice.

Prevent illness from WATER

Listen to and follow public announcements. Local authorities will tell you if tap water is safe to drink or to use for cooking or bathing. If the water is not safe to use, follow local instructions to use bottled water or to boil or disinfect water for cooking, cleaning, or bathing.

Correctly boil or disinfect water. Hold water at a rolling boil for 1 minute to kill bacteria. If you can't boil water, add 1/8 teaspoon (~0.75 mL) of newly purchased, unscented liquid household bleach per gallon of water. Stir the water well, and let it stand for 30 minutes before you use it. You can use water-purifying tablets instead of boiling water or using bleach. For infants, use **only** pre-prepared canned baby formula. Do not use powdered formulas prepared with treated water. Clean children's toys that have come in contact with water. Use a solution of 1 cup of bleach in 5 gallons of water to clean the toys. Let toys air dry after cleaning.

Prevent and treat OTHER ILLNESS and INJURIES

Prevent carbon monoxide poisoning. Carbon monoxide is an odorless, colorless gas that is produced by many types of equipment and is poisonous to breathe. Don't use a generator, charcoal grill, camp stove, or other gasoline- or charcoal-burning device inside your home, basement, or garage or near a window, door, or vent. Don't run a car or truck inside a garage attached to your house, even if you leave the door open. Don't heat your house with a gas oven. If your carbon monoxide detector sounds, leave your home immediately and call 911. Seek prompt medical attention if you suspect carbon monoxide poisoning and are feeling dizzy, light-headed, or nauseated.

Avoid floodwater and mosquitoes. Follow all warnings about water on roadways. Do not drive vehicles or heavy equipment through water. If you have to work in or near floodwater, wear a life jacket. If you are caught in an area where floodwater is rising, wear a life jacket, or wear or keep at hand some other type of flotation device. Prevent mosquito bites by wearing long pants, socks, and long-sleeved shirts and using insect repellents that contain DEET or Picaridin. More information about these and other

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recommended repellents can be found in the fact sheet "Updated Information Regarding Insect Repellents" at www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm.

Avoid unstable buildings and structures. Stay away from damaged buildings or structures until they have been examined and certified as safe by a building inspector or other government authority. Leave immediately if you hear shifting or unusual noises that signal that the structure is about to fall.

Beware of wild or stray animals. Avoid wild or stray animals. Call local authorities to handle animals. Get rid of dead animals according to local guidelines.

Beware of electrical and fire hazards. NEVER touch a fallen power line. Call the power company to report fallen power lines. Avoid contact with overhead power lines during cleanup and other activities. If electrical circuits and electrical equipment have gotten wet or are in or near water, turn off the power at the main breaker or fuse on the service panel. Do not turn the power back on until electrical equipment has been inspected by a qualified electrician. Do not burn candles near flammable items or leave the candle unattended. If possible, use flashlights or other battery-operated lights instead of candles.

Beware of hazardous materials. Wear protective clothing and gear (for example, a respirator if needed) when handling hazardous materials. Wash skin that may have come in contact with hazardous chemicals. Contact local authorities if you are not sure about how to handle or get rid of hazardous materials.

Clean up and prevent mold growth. Clean up and dry out the building quickly (within 24 to 48 hours). Open doors and windows. Use fans to dry out the building. To *prevent* mold growth, clean wet items and surfaces with detergent and water. To *remove* mold growth, wear impervious gloves, open windows and doors, and clean with a bleach solution of 1 cup of bleach in 1 gallon of water. Throw away porous items (for example, carpet and upholstered furniture) that cannot be dried quickly. Fix any leaks in roofs, walls, or plumbing.

Pace yourself and get support. Be alert to physical and emotional exhaustion or strain. Set priorities for cleanup tasks, and pace the work. Try not to work alone. Don't get exhausted. Ask your family members, friends, or professionals for support. If needed, seek professional help.

Prevent musculoskeletal injuries. Use teams of two or more people to move bulky objects. Avoid lifting any material that weighs more than 50 pounds (per person).

Stay cool. When it's hot, stay in air-conditioned buildings; take breaks in shaded areas or in cool rooms; drink water and nonalcoholic fluids often; wear lightweight, light-colored, loose-fitting clothing; and do outdoor activities during cooler hours.

Treat wounds. Clean out all open wounds and cuts with soap and clean water. Apply an antibiotic ointment. Contact a doctor to find out whether more treatment is needed (such as a tetanus shot). If a wound gets red, swells, or drains, seek immediate medical attention.

Wash your hands. Use soap and water to wash your hands. If water isn't available, you can use alcohol-based products made for washing hands.

Wear protective gear for cleanup work. Wear hard hats, goggles, heavy work gloves, and watertight boots with steel toe and insole (not just steel shank). Wear earplugs or protective headphones to reduce risk from equipment noise.

For more information, visit www.bt.cdc.gov/disasters/hurricanes
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

July 25, 2005

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Chemical Emergencies Overview

The CDC has a key role in protecting the public's health in an emergency involving the release of a chemical that could harm people's health. This document provides information to help people be prepared to protect themselves during and after such an event.

What chemical emergencies are

A chemical emergency occurs when a hazardous chemical has been released and the release has the potential for harming people's health. Chemical releases can be unintentional, as in the case of an industrial accident, or intentional, as in the case of a terrorist attack.

Where hazardous chemicals come from

Some chemicals that are hazardous have been developed by military organizations for use in warfare. Examples are nerve agents such as sarin and VX, mustards such as sulfur mustards and nitrogen mustards, and choking agents such as phosgene. It might be possible for terrorists to get these chemical warfare agents and use them to harm people.

Many hazardous chemicals are used in industry (for example, chlorine, ammonia, and benzene). Others are found in nature (for example, poisonous plants). Some could be made from everyday items such as household cleaners. These types of hazardous chemicals also could be obtained and used to harm people, or they could be accidentally released.

Types and categories of hazardous chemicals

Scientists often categorize hazardous chemicals by the type of chemical or by the effects a chemical would have on people exposed to it. The categories/types used by the Centers for Disease Control and Prevention are as follows:

- **Biotoxins**—poisons that come from plants or animals (see www.bt.cdc.gov/agent/agentlistchem-category.asp#biotoxins)
- **Blister agents/vesicants**—chemicals that severely blister the eyes, respiratory tract, and skin on contact (see www.bt.cdc.gov/agent/vesicants)
- **Blood agents**—poisons that affect the body by being absorbed into the blood (see www.bt.cdc.gov/agent/agentlistchem-category.asp#blood)
- **Caustics (acids)**—chemicals that burn or corrode people's skin, eyes, and mucus membranes (lining of the nose, mouth, throat, and lungs) on contact (see www.bt.cdc.gov/agent/agentlistchem-category.asp#acids)
- **Choking/lung/pulmonary agents**—chemicals that cause severe irritation or swelling of the respiratory tract (lining of the nose and throat, lungs) (see www.bt.cdc.gov/agent/agentlistchem-category.asp#choking)

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- **Incapacitating agents**—drugs that make people unable to think clearly or that cause an altered state of consciousness (possibly unconsciousness) (see www.bt.cdc.gov/agent/agentlistchem-category.asp#incapacitating)
- **Long-acting anticoagulants**—poisons that prevent blood from clotting properly, which can lead to uncontrolled bleeding (see www.bt.cdc.gov/agent/agentlistchem-category.asp#anticoagulant)
- **Metals**—agents that consist of metallic poisons (see www.bt.cdc.gov/agent/agentlistchem-category.asp#metals)
- **Nerve agents**—highly poisonous chemicals that work by preventing the nervous system from working properly (see www.bt.cdc.gov/agent/agentlistchem-category.asp#nerve)
- **Organic solvents**—agents that damage the tissues of living things by dissolving fats and oils (see www.bt.cdc.gov/agent/agentlistchem-category.asp#organicsolvents)
- **Riot control agents/tear gas**—highly irritating agents normally used by law enforcement for crowd control or by individuals for protection (for example, mace) (see www.bt.cdc.gov/agent/agentlistchem-category.asp#riotcontrol)
- **Toxic alcohols**—poisonous alcohols that can damage the heart, kidneys, and nervous system (see www.bt.cdc.gov/agent/agentlistchem-category.asp#toxicalcohols)
- **Vomiting agents**—chemicals that cause nausea and vomiting (see www.bt.cdc.gov/agent/agentlistchem-category.asp#vomiting)

Hazardous chemicals by name (A-Z list)

If you know the name of a chemical but aren't sure what category it would be in, you can look for the chemical by name on the "A–Z List of Chemical Agents" (www.bt.cdc.gov/agent/agentlistchem.asp) on the CDC Emergency Preparedness and Response website.

Protecting yourself if you don't know what the chemical is

You could protect yourself during a chemical emergency, even if you didn't know yet what chemical had been released. For general information on protecting yourself, read the fact sheets on evacuation (www.bt.cdc.gov/planning/evacuationfacts.asp), sheltering in place (www.bt.cdc.gov/planning/shelteringfacts.asp), and personal cleaning and disposal of contaminated clothing (www.bt.cdc.gov/planning/personalcleaningfacts.asp).

Basic information on chemical emergencies

Basic chemical emergency information designed for the public can be found in the general fact sheets (www.bt.cdc.gov/chemical/genfactsheets.asp) and chemical-specific fact sheets (www.bt.cdc.gov/chemical/factsheets.asp) and in the toxicology FAQs (www.bt.cdc.gov/chemical/toxfaqs.asp) on the CDC Emergency Preparedness and Response website.

In-depth information on chemical emergencies

Chemical emergency information designed for groups such as first responders, clinicians, laboratorians, and public health practitioners can be found in the case definitions (www.bt.cdc.gov/chemical/casedef.asp), toxic syndrome descriptions (www.bt.cdc.gov/chemical/tsd.asp), toxicological profiles (www.bt.cdc.gov/chemical/toxprofiles.asp), medical management guidelines

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Buffalo District

(www.bt.cdc.gov/chemical/mmg.asp), emergency response cards (www.bt.cdc.gov/chemical/erc.asp), First Responders page (www.bt.cdc.gov/chemical/responders.asp), and Laboratory Information page (www.bt.cdc.gov/chemical/lab.asp).

For more information...

For more information about chemical emergencies, you can visit the following websites:

- **Centers for Disease Control and Prevention (CDC)**
  - National Center for Environmental Health (NCEH)
    - Chemicals: Health Studies Program Activities (www.cdc.gov/nceh/hsb/chemicals)
    - Chemical Weapons Elimination (www.cdc.gov/nceh/demil)
    - Childhood Lead Poisoning Prevention Program (www.cdc.gov/nceh/lead/lead.htm)
    - National Report on Human Exposure to Environmental Chemicals (www.cdc.gov/exposurereport)
  - National Institute for Occupational Safety and Health (NIOSH)
    - Chemical Agent Information (www.cdc.gov/niosh/topics/emres/chemagent.html)
    - Chemical Safety Cards (www.cdc.gov/niosh/ipcs/icstart.html)
    - NIOSH Pocket Guide to Chemical Hazards (www.cdc.gov/niosh/npg/npg.html)

- **Agency for Toxic Substances and Disease Registry (ATSDR)**
  - Fact Sheet: Hazardous Substances Emergency Events Surveillance System (www.bt.cdc.gov/surveillance/hsees.asp)
  - Hazardous Substances in the Environment (www.atsdr.cdc.gov/2p-hazardous-substances.html)
  - Medical Management Guidelines for Acute Chemical Exposures (www.atsdr.cdc.gov/mmg.html)
  - ToxFAQs (www.atsdr.cdc.gov/toxfaq.html)

- **American Association of Poison Control Centers** (www.aapcc.org)
  - 2003 Annual Report of the American Association of Poison Control Centers (www.aapcc.org/Annual%20Reports/03report/Annual%20Report%202003.pdf)

- **Environmental Protection Agency (EPA)**
  - Pollutants/Toxics (www.epa.gov/ebtpages/pollutants.html)

- **Material Safety Data Sheets** (www.eh.doe.gov/chem_safety/Msds.html) (from the Department of Energy website)

- **National Library of Medicine**
  - Chemical Information (http://sis.nlm.nih.gov/Chem/ChemMain.html)
  - Household Products Database (http://householdproducts.nlm.nih.gov)
  - Tox Town (http://toxtown.nlm.nih.gov)

- **Regional poison control center** (1-800-222-1222)

- **State and local health departments** (www.cdc.gov/other.htm#states)

For more information, visit www.bt.cdc.gov/chemical, or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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Site Contents

Surveillance Programs

- NREVSS

Disease Information

- Measles
- Viral Gastroenteritis
  - Rotavirus
  - Norovirus
- Non-Polio Enterovirus
  - Viral Meningitis
  - Hand, Foot, and Mouth Disease
- Parvovirus B19 (Fifth Disease)
  - B19 and Pregnancy
- Adenovirus
- Human Parainfluenza
- Respiratory Syncytial Virus

Related links

- Severe Acute Respiratory Syndrome (SARS)

Viral Gastroenteritis

Esta página en Español

What is viral gastroenteritis?

Gastroenteritis means inflammation of the stomach and small and large intestines. Viral gastroenteritis is an infection caused by a variety of viruses that results in vomiting or diarrhea. It is often called the "stomach flu," although it is not caused by the influenza viruses.

What causes viral gastroenteritis?

Many different viruses can cause gastroenteritis, including rotaviruses, adenoviruses, caliciviruses, astroviruses, Norwalk virus, and a group of Noroviruses. Viral gastroenteritis is not caused by bacteria (such as *Salmonella* or *Escherichia coli*) or parasites (such as *Giardia*), or by medications or other medical conditions, although the symptoms may be similar. Your doctor can determine if the diarrhea is caused by a virus or by something else.

What are the symptoms of viral gastroenteritis?

The main symptoms of viral gastroenteritis are watery diarrhea and vomiting. The affected person may also have headache, fever, and abdominal cramps ("stomach ache"). In general, the symptoms begin 1 to 2 days following infection with a virus that causes gastroenteritis and may last for 1 to 10 days, depending on which virus causes the illness.

Is viral gastroenteritis a serious illness?

For most people, it is not. People who get viral gastroenteritis almost always recover completely without any long-term problems. Gastroenteritis is a serious illness, however, for persons who are unable to drink enough fluids to replace what they lose through vomiting or diarrhea. Infants, young children, and persons who are unable to care for themselves, such as the disabled or elderly, are at risk for dehydration from loss of fluids. Immune compromised persons are at risk for dehydration because they may get a more serious illness, with greater vomiting or diarrhea. They may need to be hospitalized for treatment to correct or prevent dehydration.

Is the illness contagious? How are these viruses spread?

Yes, viral gastroenteritis is contagious. The viruses that cause gastroenteritis are spread through close contact with infected persons (for example, by sharing food, water, or eating utensils). Individuals may also become infected by eating or drinking contaminated foods or beverages.

How does food get contaminated by gastroenteritis viruses?

Food may be contaminated by food preparers or handlers who have viral gastroenteritis, especially if they do not wash their hands regularly after using the bathroom. Shellfish may be contaminated by sewage, and persons who eat raw or undercooked shellfish harvested from contaminated waters may get diarrhea. Drinking water can also be contaminated by sewage and be a source of spread of these viruses.

Where and when does viral gastroenteritis occur?

Viral gastroenteritis affects people in all parts of the world. Each virus has its own seasonal activity. For example, in the United States, rotavirus and astrovirus infections occur during the cooler months of the year (October to April), whereas adenovirus infections occur throughout the year. Viral gastroenteritis outbreaks can occur in institutional settings, such as schools, child care facilities, and nursing homes, and can occur in other group settings, such as banquet halls, cruise ships, dormitories, and campgrounds.

Who gets viral gastroenteritis?

Anyone can get it. Viral gastroenteritis occurs in people of all ages and backgrounds. However, some viruses tend to cause diarrheal disease primarily among people in specific age groups. Rotavirus infection is the most common cause of diarrhea in infants and young children under 5 years old. Adenoviruses and astroviruses cause diarrhea mostly in young children, but older children and adults can also be affected. Norwalk and Noroviruses are more likely to cause diarrhea in older children and adults.

How is viral gastroenteritis diagnosed?

Generally, viral gastroenteritis is diagnosed by a physician on the basis of the symptoms and medical examination of the patient. Rotavirus infection can be diagnosed by laboratory testing of a stool specimen. Tests to detect other viruses that cause gastroenteritis are not in routine use.

How is viral gastroenteritis treated?

The most important of treating viral gastroenteritis in children and adults is to prevent severe loss of fluids (dehydration). This treatment should begin at home. Your physician may give you specific instructions about what kinds of fluid to give. CDC recommends that families with infants and young children keep a supply of oral rehydration solution (ORS) at home at all times and use the solution when diarrhea first occurs in the child. ORS is available at pharmacies without a prescription. Follow the written directions on the ORS package, and use clean or boiled water. Medications, including antibiotics (which have no effect on viruses) and other treatments, should be avoided unless specifically recommended by a physician.

Can viral gastroenteritis be prevented?

Yes. Persons can reduce their chance of getting infected by frequent handwashing, prompt disinfection of contaminated surfaces with household chlorine bleach-based cleaners, and prompt washing of soiled articles of clothing. If food or water is thought to be contaminated, it should be avoided.

Is there a vaccine for viral gastroenteritis?

There is no vaccine or medicine currently available that prevents viral gastroenteritis. A vaccine is being developed, however, that protects against severe diarrhea from rotavirus infection in infants and young children.

For more information on viruses that cause viral gastroenteritis, see:

- Rotavirus
- Norovirus

Need additional information? Click here.

This page was last reviewed on January 20, 2005

Centers for Disease Control and Prevention
National Center for Infectious Diseases

Hazard Alert

Heat Stress in Construction

Heat is a serious hazard in construction. Your body builds up heat when you work and sweats to get rid of extra heat. But sometimes your body may not cool off fast enough. This can happen, say, if you are up on a roof pouring hot asphalt or you are lifting heavy loads.

Too much heat can make you tired, hurt your job performance, and increase your chance of injury. You can get skin rash. You can also get:

- **Dehydration.** When your body loses water, you can't cool off fast enough. You feel thirsty and weak.
- **Cramps.** You can get muscle cramps from the heat even after you leave work.
- **Heat exhaustion.** You feel tired, nauseous, headachy, and giddy (dizzy and silly). Your skin is damp and looks muddy or flushed. You may faint.
- **Heat stroke.** You may have hot dry skin and a high temperature, Or you may feel confused. You may have convulsions or become unconscious. **Heat stroke can kill you** unless you get emergency medical help.

The Risk of Heat Stress

Your risk of heat stress depends on many things. These include:

- Your physical condition
- The weather (temperature, humidity)
- How much clothing you have on
- How fast you must move or how much weight you must lift
- If you are near a fan or there is a breeze
- If you are in the sun.

If there is an industrial hygienist on your work site, ask the hygienist about the Wet-Bulb Globe Temperature Index. It is a more precise way to estimate the risk of heat stress.

Protect Yourself

Try to do these things:

- **Drink a lot of cool water all day — before you feel thirsty.** Every 15 minutes, you may need a cup of water (5 to 7 ounces).

(Please turn the page.)

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- **Keep taking rest breaks**. Rest in a cool, shady spot. Use fans.
- **Wear light-colored clothing,** made of cotton.
- **Do the heaviest work in the coolest time of the day**.
- **Work in the shade**.
- **For heavy work in hot areas,** take turns with other workers, so some can rest.
- **If you travel to a warm area for a new job,** you need time for your body to get used to the heat. Be extra careful the first 2 weeks on the job.
- **If you work in protective clothing,** you need more rest breaks. You may also need to check your temperature and heart rate. On a Superfund site where the temperature is 70 degrees or more, the U.S. Environmental Protection Agency (EPA) says a health professional should monitor your body weight, temperature, and heart rate.
- **If you think someone has heat stroke, call emergency services (or 911).** Immediately move the victim to the shade. Loosen his/her clothes. Wipe or spray his/her skin with cool water and fan him/her. You can use a piece of cardboard or other material as a fan.

OSHA does not have a special rule for heat. But because heat stress is known as a serious hazard, workers are protected under the **General Duty Clause** of the Occupational Safety and Health Act. The clause says employers must provide "employment free from recognized hazards causing or likely to cause physical harm."

For more information, call your local union, the Center to Protect Workers' Rights (CPWR) (301-578-8500 or www.cpwr.com), the National Institute for Occupational Safety and Health (1-800-35-NIOSH or www.cdc.gov/niosh), or OSHA (1-800-321-OSHA or www.osha.gov). Or check the website www.elcosh.org

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The Center to Protect Workers' Rights is the research and development institute of the Building and Construction Trades Dept., AFL-CIO: CPWR, Suite 1000, 8484 Georgia Ave., Silver Spring, MD 20910. (Edward C. Sullivan is president of the Building and Construction Trades Department and CPWR.) Production of this flyer was supported by grants UO2/310982 and UO2/312014 from the National Institute for Occupational Safety and Health (NIOSH). The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH.

Heat stress - April 9, 2001

OSHA FactSheet

Protect Yourself! Workers may be exposed to

Black Widow Spider

The black widow belongs to a group of spiders commonly known as cobweb spiders. The characteristic hourglass is located on the underside of the abdomen. Female black widows are dangerous and can bite and inject toxic venom.

Identification

- The female black widow is normally shiny black, with a red hourglass marking (see photo) on the underside of the abdomen.
- The abdominal marking may range in color from yellowish orange to red and its shape may range from an hourglass to a dot.
- The body of an adult black widow female is about 1/2 inch long.

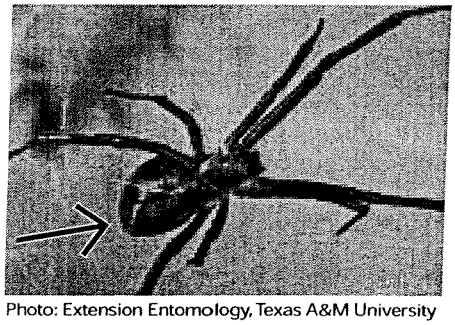

Photo: Extension Entomology, Texas A&M University

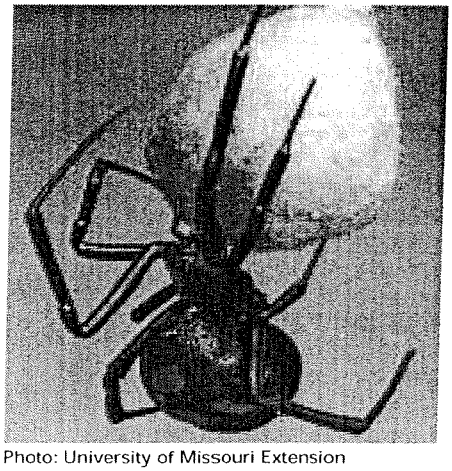

Photo: University of Missouri Extension

Habitat

The black widow is commonly found in the following places:

- Outdoors - woodpiles, rubble piles, under stones, in hollow stumps, and in rodent burrows, privies, sheds and garages.
- Indoors - undisturbed, cluttered areas in basements and crawl spaces.

Symptons

- The bite of the black widow may be painful or it may go unnoticed.
- The skin may display one or two bite marks with local swelling. Pain usually progresses from the bite site and eventually to the abdomen and back.
- Severe cramping or rigidity may occur in the abdominal muscles.
- Symptoms may include nausea, profuse perspiration, tremors, labored breathing, restlessness, increased blood pressure and fever.
- The pain from the bite will usually persist for the first 8-12 hours.
- Symptoms may continue for several days.

Protection

- Wear a long-sleeved shirt, hat, gloves, and boots when handling boxes, firewood, lumber, and rocks, etc.
- Inspect and shake out clothing and shoes before getting dressed.
- Use insect repellants, such as DEET or Picaridin, on clothing and footwear.

Treatment

- Clean the bite area with soap and water.
- Apply ice to the bite area to slow absorption of the venom.
- Elevate and immobilize the extremity.
- Capture the spider, if at all possible, for identification purposes.
- Seek medical attention immediately.
- If you have a heart condition or other heart problem, you may need hospitalization.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For more complete information:

OSHA Occupational Safety and Health Administration

U.S. Department of Labor
www.osha.gov
(800) 321-OSHA
DSG 10/2005

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OSHA FactSheet

Protect Yourself! Workers may be exposed to

Brown Recluse Spider

The brown recluse belongs to a group of spiders commonly known as violin spiders or fiddlebacks. The characteristic fiddle-shaped pattern is located on the top of the leg attachment region (cephalothorax). Because they are secluded and withdrawn, as their name implies, the brown recluse avoids open spaces. Brown recluse spiders are dangerous and they can bite and inject toxic venom.

Identification

- Body size: 1/4 to 3/4 inch (6.4-19.1mm)
- Color: Golden brown
- A dark violin/fiddle shape (see top photo) is located on the top of the leg attachment region (cephalothorax) with the neck of the violin/fiddle pointing backward toward the abdomen.
- Unlike most spiders that have 8 eyes, the brown recluse has 6 eyes. The eyes, arranged in pairs – one pair in front and a pair on either side – can be readily seen under low magnification.

Habitat

The Brown Recluse Spider builds small retreat webs behind objects of any type.

Symptoms

- The severity of the bite may vary. Symptoms may vary from none to very severe.
- The bite generally becomes reddened within several hours.

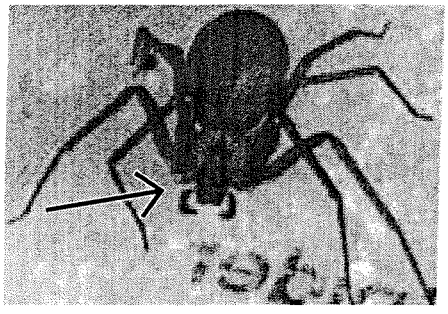

Photo: R. Bessin, University of Kentucky

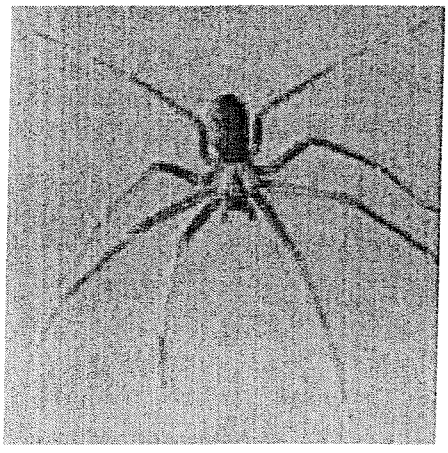

Photo: creatures.ifas.ufl.edu

- There is often a systemic reaction within 24-36 hours characterized by restlessness, fever, chills, nausea, weakness and joint pain.
- Tissue at the site of the bite and the surrounding area dies and eventually sheds.

Protection

- Wear a long-sleeved shirt, hat, gloves, and boots when handling stored boxes, firewood, lumber and rocks, etc.
- Inspect and shake out clothing and shoes before getting dressed.
- Use insect repellants, such as DEET or Picaridin, on clothing and footwear.

Treatment

- Clean the bite area with soap and water.
- Apply ice to the bite area to slow absorption of the venom.
- Elevate and immobilize the bitten extremity.
- Capture the spider, if at all possible, for identification purposes.
- Seek medical attention.

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For more complete information:

OSHA Occupational Safety and Health Administration

U.S. Department of Labor
www.osha.gov
(800) 321-OSHA
DSG 10/2005

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OSHA FactSheet

Protect Yourself! Workers may be exposed to

Fire Ants

Fire ants resemble ordinary ants. They average 1/8 to 1/4 inch in length and are reddish brown to black in color. Fire ants display aggressive behavior and they build mound-shaped nests.

Interaction

Fire ants attack anything that disturbs their mound (nest). They firmly grasp skin with their jaws, and then sting and inject venom. Fire ants pivot at the head and inflict more stings in a circular pattern.

Photo: Texas A&M University

Symptoms

The sting of a fire ant develops into a pustule (small, firm blister-like sore) in 24-48 hours. These pustules can become sites of secondary infection. Fire ant venom may cause a severe reaction in hypersensitive individuals, including nausea, shock, chest pains, and in rare cases, coma.

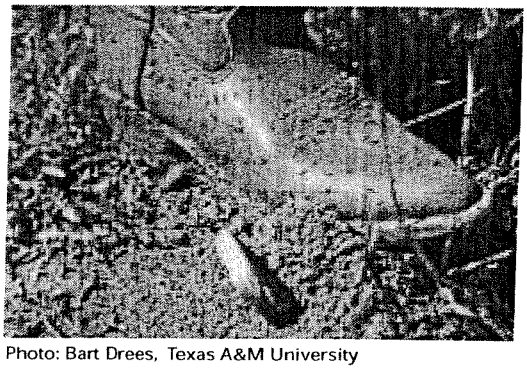

Photo: Bart Drees, Texas A&M University

Prevention/Treatment

- Be aware – don't stand on ant nests or areas where they are foraging.
- Wear boots and/or tuck pant legs into your socks to reduce the risk of bite/sting.
- Use insect repellants, such as DEET or Picaridin, on clothing and footwear.
- If attacked, leave area immediately while brushing off ants with the use of a gloved hand or by using a cloth.
- Consult your pharmacist for treatment of minor bites and irritation.
- Seek immediate medical attention, particularly if you feel short of breath or have swelling.

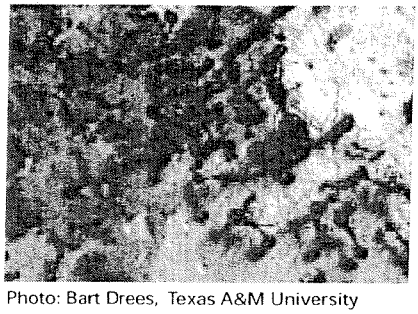

Photo: Bart Drees, Texas A&M University

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Cottonmouth Snakes (Water Moccasin)

Also known as the water moccasin or stump-tailed moccasin, this dangerous semi-aquatic snake is a truly aggressive reptile that will stand its ground or even approach an intruder.

Identification

Cottonmouth snakes average 5-55 inches in length. The triangular shaped head is set off with distinct elliptical 'cat-eye' pupils. The adult snake's skin is dark tan, brown or nearly black, with vague black or dark brown crossbands; juveniles have a bold crossbanded pattern of brown and pink or orange, with a yellow tail.

Habitats

Cottonmouths frequent swamplands and pond, lake and stream borders, especially those with dense canopies. They frequently remain coiled near water, or on logs and stumps in water. Upon provocation, cottonmouths will coil, open their mouths to expose the white lining, and shake their tails. They are highly defensive and not inclined to get out of one's way. Cottonmouths tend to latch on during a bite rather than the quick strike-and-release pattern of its cousin the Copperhead.

Snake Bite Prevention

- Be cautious about where your hands and feet are placed. Do not put your hands in holes or under objects (i.e., lumber, scrap metal, overturned boats) without first being sure that a snake is not located underneath.
- Do not sit or lay down in vegetation or other situations where there may be any doubt about the presence of snakes.
- Wear proper foot gear, such as hightop leather boots and leather gloves when handling materials mentioned above.
- Do not attempt to capture, tease or handle venomous snakes. Involuntary nervous activity may allow snakes to bite for up to an hour after they appear to have been "killed."
- A snake's striking distance is about 1/2 the total length of the snake.

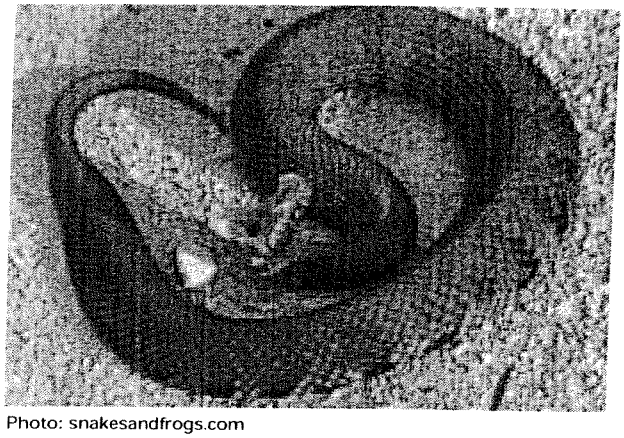

Photo: snakesandfrogs.com

Snake Bite Treatment

- The first step in snakebite treatment is to avoid panic. Keep bite victims still and calm to slow the spread of venom in case the snake is poisonous. Seek medical attention as soon as possible.
- If bitten, note the color and shape of the snake to help with treatment.
- Do not cut the wound or attempt to suck out the venom. Never allow the victim to drink alcohol.
- Apply first aid: lay the person down so that the bite is below the level of the heart and cover the bite with a clean, dry dressing.

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Mold

Molds are the most common forms of fungi found on earth. They can grow on almost any material, as long as moisture and oxygen are available. Most molds reproduce through the formation of spores, tiny microscopic cells that are resistant to drying and are released into the air. Airborne spores are found both indoors and outdoors. When spores land on a suitable moist surface, they begin to grow and release chemicals that digest and can eventually destroy the surface and underlying materials. Molds can also cause adverse health effects.

Health Effects of Mold Exposure

Molds can cause mild to severe health problems in sensitive individuals when a sufficient number of airborne spores are inhaled. Some individuals are far more sensitive than others. The most common health effects associated with mold exposure are allergic reactions. Symptoms may include:

- Sneezing
- Runny nose
- Eye irritation
- Cough
- Congestion
- Aggravation of asthma
- Dermatitis (skin rash)

People at Greatest Risk

Infants, children, and the elderly are more susceptible to health problems attributable to molds. In addition, people with the following underlying health conditions may be more sensitive to molds:

- Individuals with allergies or existing respiratory conditions including asthma, sinusitis, or other lung diseases.
- Individuals with a weakened immune system (e.g., HIV patients).
- Recent organ or bone marrow transplant patients.
- Patients recovering from recent surgery and receiving chemotherapy or long-term steroid treatment.

How to Recognize Mold

Mold may be recognized by:

- Sight – They usually appear as distinctly colored woolly mats (e.g., mildew is black and is one of the most common molds in a household).
- Smell – They often produce a foul odor, such as a musty, earthy smell.

Preventing Mold Growth

The key to mold prevention is moisture control. Mold will not grow if moisture is absent.

- Remove excess moisture with a wet-dry vacuum and dry out the building as quickly as possible (preferably within 24 to 48 hours).
- Use fans to assist in the drying process.
- Clean wet materials and surfaces with detergent and water.
- Discard all water damaged materials.
- Discard all materials visibly contaminated with mold.
- Remove and discard all porous materials that have been wet for more than 48 hours. Porous materials cannot be cleaned and may remain a source of mold growth. These materials include the following:
  - Carpeting and carpet padding;
  - Upholstery, wallpaper, drywall;
  - Floor and ceiling tiles, insulation materials;
  - Clothing;

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- Leather;
- Paper, wood;
- Food.

- Homeowners may want to temporarily store items outside of the home until insurance claims can be filed.

General Cleanup Tips

- Make sure the working area is well ventilated.
- Place mold damaged materials in a plastic bag and discard.
- Clean mold off hard surfaces and other nonporous materials with detergent and water, and dry completely.
- Disinfect these cleaned surfaces with one of the following household bleach solutions:
  - 1/4 cup household bleach per 1 gallon of clean water for light contamination.
  - 1 1/2 cups household bleach per 1 gallon of clean water for heavy contamination.

CAUTION: Do not mix bleach with other cleaning products that contain ammonia. Highly toxic chlorine gas can be produced.

- Avoid breathing mold spores. A N-95 respirator is recommended.
- Avoid touching mold with your bare hands. Long gloves that extend to the middle of the forearm are recommended. Use ordinary household rubber gloves when cleaning surfaces with water, bleach, and a mild detergent. Gloves made from natural rubber, neoprene, nitrile, polyurethane, or PVC are recommended if using a disinfectant, biocide, or strong cleaning solution.
- Avoid getting mold spores in your eyes. Goggles without ventilation holes are recommended.

Additional Information

Visit OSHA's Safety and Health Topics webpage on Molds and Fungi at http://www.osha.gov/SLTC/molds/index.html

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West Nile Virus

West Nile Virus (WNV) infection is an illness transmitted to humans primarily by mosquitoes. The pathogen that causes WNV infection is a virus that is known to infect birds and other animals as well as humans. Employees working outside are at risk, particularly in warmer weather (when mosquitoes are more likely to be present). The following information below is designed to educate employers and workers on the virus and also offer ways to reduce the risks of infection.

What are the signs and symptoms of West Nile Virus?

In most cases, persons infected with WNV either show no symptoms or have very mild flu-like symptoms, called West Nile fever. These mild cases of West Nile fever normally last only a few days and are not believed to cause any long-term effects. The typical time from infection to the onset of signs and symptoms is 3 to 14 days. Signs and symptoms of the milder illness, West Nile fever, include headache, fever, body aches, swollen lymph nodes, and/or a skin rash on the body.

According to the Centers for Disease Control and Prevention (CDC), severe illness is reported to occur in about 1 in every 150 persons infected with WNV. Symptoms of severe disease may last several weeks and may have permanent neurological effects. The signs and symptoms of more severe infection (West Nile encephalitis or meningitis) include headache, high fever, stiffness in the neck, disorientation (in very severe cases, coma), tremors and convulsions and muscle weakness (in very severe cases, paralysis). Persons who develop symptoms of severe WNV illness should seek medical attention immediately, as this disease can be fatal.

How can workers become exposed?

Flooded areas, particularly in warm climates, provide the opportunity for mosquitoes to breed in stagnant water. Bites from infected mosquitoes may result in WNV.

What can employers do to reduce the risk to workers?

Employers should keep in mind that elimination of mosquito breeding grounds is a highly effective way of reducing mosquito populations and reducing the number of mosquito bites. Mosquitoes lay eggs in standing water. Employers with employees working in and around areas of stagnant water should:

- Be aware of working conditions, i.e., the presence of equipment or areas where water accumulates.
- Advise employees to inspect work areas and, where possible, get rid of sources of stagnant or standing water to remove a potential breeding ground of mosquitoes.
- Reduce or eliminate mosquito populations by disrupting mosquito breeding grounds (i.e., whenever possible, drain ditches, gutters, etc., to get rid of sources of stagnant or standing water).
- Encourage workers to protect themselves from skin contact with dead birds. CDC recommends using gloves or an inverted plastic bag when handling dead birds.

What can workers do to protect themselves?

It may not always be possible to eliminate all potential mosquito breeding grounds. Knowledge of some key steps that employees can take to minimize the risk of mosquito bites is, therefore, important in reducing the risk of WNV infection. Employees who work

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outdoors should be aware that the use of personal protective equipment and techniques is essential to preventing mosquito bites. Employees should:

- Cover as much of the skin as possible by wearing shirts with long sleeves, long pants and socks whenever possible. Use light weight clothing to minimize the potential for heat-induced illnesses.
- Use insect repellents containing DEET on skin that is not covered by clothing. According to the CDC, the most effective repellents contain DEET (N, N-diethyl-m-toluamide or N, N-diethyl-3-methylbenzamide).
- Avoid the use of perfumes and colognes when working outdoors during peak times when mosquitoes may be active; mosquitoes may be more attracted to individuals wearing perfumes and colognes.
- Choose a repellent that provides protection for the amount of time that you will be outdoors/in areas of concern. The more DEET a repellent contains, the longer time it can protect one from mosquito bites, with protection times ranging from 1 hour (4.75% DEET) to 5 hours (23.8% DEET).
- Spray insect repellent on the outside of one's clothing, as it is possible for mosquitoes to bite through thin clothing.
- Do NOT spray insect repellent on skin that is under clothing.
- Never apply repellents over open wounds or irritated skin.
- Do NOT spray aerosol or pump products in enclosed areas. Do NOT spray a pump or aerosol product directly on one's face. First spray on hands and carefully rub on face (do not allow insect repellent to contact one's eyes and mouth).
- After working in areas where mosquitoes are a concern, use soap and water to wash skin that has been treated with insect repellent.
- Be extra vigilant at dusk and dawn when mosquitoes are most active.

Additional Resources:

CDC West Nile Virus Home Page at: www.cdc.gov/ncidod/dvbid/westnile/index.htm

The U.S. EPA (information on the use of insect repellents): www.epa.gov/pesticides/factsheets/insectrp.htm

OSHA at www.osha.gov/dts/shib/shib082903b.html

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