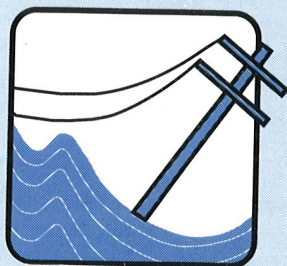
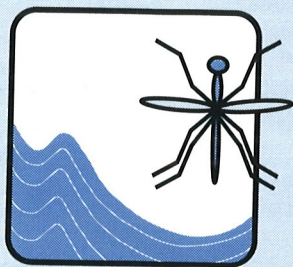
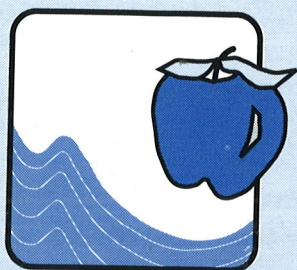
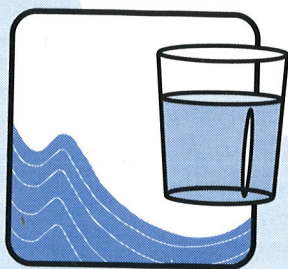


Beyond the Flood

A Prevention Guide for Personal Health and Safety



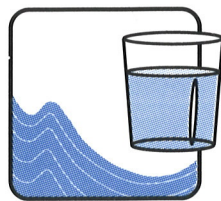
CDC
CENTERS FOR DISEASE CONTROL
AND PREVENTION

Beyond the Flood

A Prevention Guide for Personal Health and Safety

After a flood, the physical devastation to a community is obvious. But during the flood and its aftermath, there are some basic facts to remember that will help protect your personal health and safety. This pamphlet provides information that will help you and other flood victims prevent disease and injury and maintain good health in the days and weeks following a flood.

This information is provided by the Centers for Disease Control and Prevention (CDC) through state and local health departments. It includes general disease and injury prevention guidelines which may vary slightly from state to state. If in doubt, contact your local or state health departments, which will issue health advisories or recommendations particular to local conditions.



Water Quality

Listen for public announcements on the safety of the municipal water supply. Flooded, private water wells will need to be tested and disinfected after floodwaters recede. Questions about testing should be directed to your local or state health departments.

Water for Drinking and Cooking

Water that might be contaminated should be boiled. It is safe to drink water that is bottled, boiled, or treated. Specific recommendations will vary from state to state. Here are some general rules concerning your drinking water. If in doubt, contact your state or local health department, local water operator, or agriculture extension office. Remember:

- bottled water should be obtained from known origins;
- if origin is unknown, water should be boiled for at least 2-3 minutes and sometimes up to 10 minutes;
- water may be treated with halogen tablets, such as halzone, or by mixing five drops (1/8 teaspoon) of unscented, ordinary household bleach per gallon of water. Mix the solution thoroughly, and let stand for about thirty minutes. However, this treatment will not kill parasitic organisms. Continue to drink boiled water until water can be tested; and
- do not use contaminated water to make ice, brush your teeth, or wash dishes.



Disinfecting Wells

If you suspect that your well may be contaminated, contact your local or state health department or agriculture

extension agent for advice. Use the following instructions for disinfecting wells.

To Disinfect Bored or Dug Wells

1. Use Table 1 to calculate how much bleach (liquid or granules) to use.
2. To determine the exact amount to use, multiply the amount of disinfectant needed (according to the diameter of the well) by the depth of the well. For example, a well 5 feet in diameter requires 4 1/2 cups of bleach per foot of water. If the well is 30 feet deep, multiply 4 1/2 by 30 to determine the total cups of bleach required ($4\ 1/2 \times 30 = 135$ cups). There are sixteen cups in each gallon of liquid bleach.
3. Add this total amount of disinfectant to about 10 gallons of water. Splash the mixture around the wall or lining of the well. Be certain the disinfectant solution contacts all parts of the well.
4. Seal the well top.
5. Open all faucets and pump water until a strong odor of bleach is noticeable at each faucet. Then stop the pump and allow the solution to remain in the well overnight.
6. The next day, operate the pump by turning on all faucets, continuing until the chlorine odor disappears. Adjust the flow of water faucets or fixtures that discharge to septic systems to a low flow to avoid overloading the disposal system.

Table 1. Bleach for a Bored or Dug Well

Diameter of well (in feet)	Amount of 5.25% laundry bleach per foot of water	Amount of 70% chlorine granules per foot of water
3	1 1/2 cups	1 ounce
4	3 cups	2 ounces
5	4 1/2 cups	3 ounces
6	6 cups	4 ounces
7	9 cups	6 ounces
8	12 cups	8 ounces
10	18 cups	12 ounces

To Disinfect Drilled Wells

1. Determine the amount of water in the well by multiplying the gallons per foot by the depth of the well in feet. For example, a well with a 6-inch diameter contains 1.5 gallons of water per foot. If the well is 120 feet deep, multiply 1.5 by 120 ($1.5 \times 120 = 180$).
2. For each 100 gallons of water in the well, use the amount of chlorine (liquid or granules) indicated in Table 2. Mix the total amount of liquid or granules with about 10 gallons of water.
3. Pour the solution into the top of the well before the seal is installed.
4. Connect a hose from a faucet on the discharge side of the pressure tank to the well casing top. Start the pump. Spray the water back into the well and wash the sides of the casing for at least 15 minutes.
5. Open every faucet in the system and let the water run until the smell of chlorine can be detected. Then close all the faucets and seal the top of the well.
6. Let stand for several hours, preferably overnight.
7. After you have let the water stand, operate the pump by turning on all faucets, continuing until all odor of chlorine disappears. Adjust the flow of water from faucets or fixtures that discharge into septic tank systems to a low flow to avoid overloading the disposal system.

Table 2. Bleach for a Drilled Well

Diameter of Well (in inches)	Gallons per foot
3	.37
4	.65
5	1.0
6	1.5
8	2.6
10	4.1
12	6.0

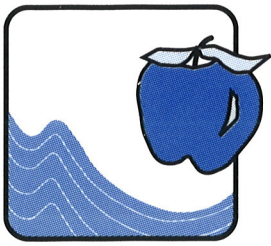
Amount of Disinfectant Required for each 100 gallons of water

Laundry Bleach (5.25% Chlorine) 3 cups*
Hypochloride Granules (70% Chlorine) 2 ounces**

*1 cup = 8-ounce measuring cup

**1 ounce = 2 heaping tablespoons of granules

Source: Illinois Department of Public Health.
Recommendations may vary from state to state.



Food Safety

Do not eat any food that may have come into contact with flood water. Discard any food without a waterproof container if there is any chance that it has come into contact with flood water. Undamaged, commercially canned foods can be saved if you remove the can labels, thoroughly wash the cans, and then disinfect them with a solution consisting of one cup of bleach in 5 gallons of water. Do not forget to re-label your cans with a marker. Home canned food should be washed and disinfected in the same manner, but the food itself should also be boiled for 10 minutes before being consumed. To ensure the health of infants, use only pre-prepared canned baby formula rather than powdered formulas prepared with treated water.

Frozen and Refrigerated Foods

If your refrigerator or freezer has been without power for several hours, food should be discarded. If you will be without power for a longer period:

- divide your frozen foods among friends' freezers if they have electricity;
- seek freezer space in a store, church, school, or commercial freezer that has electrical service; or
- use dry ice — 25 pounds of dry ice will keep a 10-cubic-foot freezer below freezing for three to four days. (Exercise care when handling dry ice, because it freezes everything it touches. Wear dry, heavy gloves to avoid injury.)

Thawed food can usually be eaten or refrozen if it is still “refrigerator cold,” or if it still contains ice crystals. To be safe, remember, “When in doubt, throw it out.” Discard any food that has been at room temperature for two hours or more, and any food that has an unusual odor, color or texture.

Your refrigerator will keep foods cool for about 4 hours without power. Add block or dry ice to your refrigerator if the electricity is off longer than 4 hours.

Sanitation and Hygiene

One result of the flood may be a lapse in basic hygiene during the emergency period. It is critical for you to remember to practice basic hygiene. You **must** wash your hands with soap and water that has been boiled or disinfected:



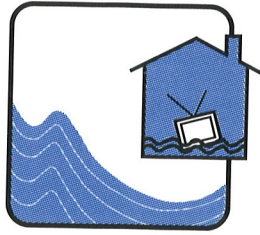
- before preparing or eating food;
- after toilet use;
- after participating in flood cleanup activities; and
- after handling articles contaminated with flood water or sewage.

Flood waters may contain fecal material from overflowing sewage systems, and agricultural and industrial byproducts. Although skin contact with flood water does not, by itself, pose a serious health risk, there is some risk of disease from eating or drinking anything contaminated with flood water. If you have any open cuts or sores that will be exposed to flood water, keep them as clean as possible by washing well with soap to control infection. If a wound develops redness, swelling, or drainage, seek immediate medical attention.

In addition, parents need to help children avoid water-borne illness. Do not allow children to play in flood water areas, wash children's hands frequently (especially before meals), and do not allow children to play with flood water-contaminated toys that have not been disinfected. You can disinfect toys using a solution of one ounce of bleach (1/8 cup) in 2 gallons of water.

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.

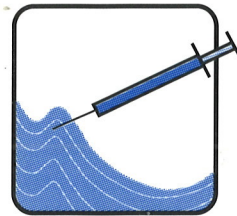
You must consult your utility company about using electrical equipment, including power generators. Be aware that it is against the law and a violation of all electrical codes to connect generators to your home's electrical circuits without the approved, automatic interrupt devices. If a generator is 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.

Cleanup

Walls and hard-surfaced floors should be cleaned with soap and water and disinfected with a solution of 1/2 cup (4 ounces) of bleach to one gallon of water.

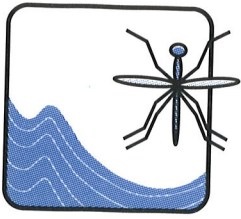
You need to be particularly careful to thoroughly disinfect food contact surfaces (counter tops, pantry shelves, refrigerators, etc.) and areas where small children play. Wash all linens and clothing in hot water, or dry clean them. For items that cannot be washed or dry cleaned, such as mattresses and 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 absorbent household materials, such as wallcoverings, cloth, rugs, and sheetrock.



Immunizations

Outbreaks of communicable diseases after floods are unusual. While 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. Anyone receiving a puncture wound or a wound contaminated with feces, soil, or saliva during flood recovery should have a doctor determine whether a tetanus booster is necessary.

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



Mosquitoes

The large amount of pooled water remaining after the flood will lead to an increase in mosquito populations. The majority of these mosquitoes will be pests, but will not carry communicable diseases.

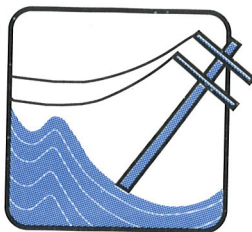
You should protect yourself from mosquitoes through the use of screens on dwellings, wearing long-sleeved and long-legged clothing, and using repellents containing DEET for personal protection. DEET is a common insect repellent chemical found in many repellent products. Products containing DEET are available from retail outlets and through local and state health departments.

Also after the flood, do not forget to drain all standing water left in containers around your home, an effective measure for controlling the mosquito population in the weeks ahead. Local, state, and federal public health authorities will be actively monitoring the situation in order to control the spread of any mosquito-borne diseases.

Other Hazards

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. Also, do not rely on cars or other vehicles to protect you from floodwaters; in fact, people are even more likely to drown inside a vehicle.



Animals

Many wild animals have been forced from their natural habitats by flooding, and many domestic animals are also without homes after the flood. Take care to avoid these animals, because some may carry rabies. Remember, most animals are disoriented and displaced, too. Do not corner an animal. If an animal must be removed, contact your local animal control authorities. Your local and state health department can provide information about the types of wild animals that carry rabies in your area.

Rats may be a problem during and after a flood. Take care to secure all food supplies, and remove any animal carcasses in the vicinity by contacting your local animal control authorities or private rendering companies.

If you are bitten by any animal, seek immediate medical attention. If you are bitten by a snake, first try to accurately identify the type of snake so that, if poisonous, the correct anti-venom may be administered.

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 from their normal storage place, including solvents, aerosol cans and industrial chemicals.

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

Also, car batteries, while flooded, may still contain an electrical charge, and should be removed with extreme caution, using insulated gloves.

Summary

The physical devastation that accompanies a flood is enormous. But as the flood waters recede, there may be more threats to your personal health and safety. By taking some basic precautions, you can help prevent many injuries as well as the possibility of some diseases.

In the midst of all this water, remember that it is summer, and heat will play a major role in your personal health. Drink plenty of fluids, avoid caffeine, and do not wait to get thirsty. When possible, take a break, being careful not to get any more exhausted than you already may be. Do not add heat stress to your other problems.

The weeks after a flood are going to be rough. In addition to your physical health, you need to take some time to consider your mental health as well. Remember that some sleeplessness, anxiety, anger, hyperactivity, mild depression, or lethargy are normal, and may go away with time. If you feel any of these symptoms acutely, seek some counseling. Your state and local health departments will help you find the local resources, including hospitals or health care providers, that you may need.

In addition to the information provided in this pamphlet, local and state health departments or civil defense agencies may issue health advisories particular to your location. For more information, contact your local or state health departments.