

## Flooding and Sewage Back-ups: Home Care Guide

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### Background/Introduction

This document has been jointly prepared by the Massachusetts Department of Public Health Division of Community Sanitation (DPH), and the Massachusetts Department of Environmental Protection (DEP) and is intended to provide guidance to the general public relative to managing pathogen risks from direct contact with floodwaters and/or sewage backups.

***It is important to note that during and following flooding events, dangerous and even life-threatening hazards may exist, and the public is strongly urged to contact local and state emergency management officials for instructions on the procedures or actions necessary to safely avoid injury during these conditions.***

This document *is not* intended to directly address these public safety issues (such as risks from accidental electrocution from flooded basements or downed power lines). Additional information on the public safety hazards associated with floodwaters can be found at the [Massachusetts Department of Public Health](#), [Red Cross](#) and [Federal Emergency Management Agency](#) and [Massachusetts Emergency Management Agency](#) websites.

Pathogens are disease-causing agents, which can be in the form of bacteria, viruses, mold spores, or protozoans, and which are normally present in large numbers in sewage wastes. The nature and extent of potential pathogen risks of sewer backups and floodwaters will depend in large part on the potential contaminants expected to be in the waters. In general, the greater the extent of the sewage component, the more likely the potential for adverse impacts, and the more important the proper cleanup of the materials that have come into direct contact with the contaminated waters. The severity of the health threat therefore depends on the source of the water and the extent of penetration into the building environment. The extent of penetration is dependent on the porosity of contaminated materials, the quantity of floodwater, and the amount of time the water remains in contact with materials. Even floodwater or stormwater which has not been directly impacted by sewage discharges is likely to contain a wide variety of microbiological organisms (e.g., from animal wastes, street runoff, etc.) and must be properly managed. Some of these pathogens, such as mold spores, can even establish an ecological niche and present a health risk from chronic exposure for some time after the event. Preventive measures, and proper cleanup procedures are essential in mitigating the risk of infection; this guidance is intended to assist the public in these actions.

DEP and DPH recognize that flood conditions can occur in any watershed during severe wet weather events. The potential for, and extent of, flooding depends on many factors, including: topography, flood storage capacity, the extent and location of development, infrastructure constraints, and, of course, on the severity of the storm event. DEP, through implementation of its Combined Sewer Overflow Abatement program and Sanitary Sewer Overflow Abatement program, continues to require infrastructure improvements to mitigate the potential for untreated wastewater to be discharged during wet weather events. DEP also has implemented a Stormwater Policy which provides for performance measures to control stormwater pollution and peak flow rates for projects subject to the Wetlands Protection Act, Infiltration/Inflow Control Guidelines and Illicit Connection Initiative (sewers connected to separate stormdrain systems). While these programs are important in managing the risks from exposure to floodwaters, some risk will always remain, especially for low-lying properties during and following extreme storm events. As such, DEP has collaborated with DPH to develop guidance for the public who may be at risk to flood conditions. This Guidance includes suggested actions before and after flood events to minimize the public health risk and property damage. In all cases where flood conditions are expected or occur, the public should always remain in close contact with public safety officials as well.

## Prevention:

If a home is located in an area subject to periodic flooding (such as in a floodplain) or where sewage backups have occurred, the homeowner should implement "all feasible measures" to prevent/minimize the nature and extent of impacts from such situations. Such actions can be preventive or pro-active.

Preventive actions include:

1. waterproofing the building foundation and/or sealing cracks in foundation floor or walls;
2. installation of a check valve or shut-off valve on the building sewer close to where it enters the structure, which will protect your home from sewage back-ups due to surcharging conditions in the municipal sewerage system (**you must** check with the proper sewer authority prior to taking this action!!); and
3. raising or removing any sink, toilet, washing machine, etc. in the basement that may be subject to backups when the sewer system surcharges.

Pro-active measures include:

1. purchasing or installing a pump (e.g. sump pump) to pump out water that collects in the low point of the basement or structure;
2. ensure that building gutter downspouts and drains are directed away from the foundation and toward low points away from the home;
3. to the extent possible, keep furniture and valuables above flood levels where flooding has previously occurred; and
4. if minor flooding occurs, follow the water to its point-of-entry and seal cracks or defects to the extent possible.

Remember, an ounce of prevention is worth more than a pound of cure. Flood insurance is also vitally important where properties are known to be in floodplains or flood prone areas. More information on prevention and flood insurance is available on the [FEMA website](#).

## Cleanup of Internal Areas

Once the flood waters have receded and the property can be accessed safely, cleanup operations should commence - **Remember to check with local emergency management officials before returning to a property affected by flooding!** The most important steps are to restore the environment to a dry state and salvage any valuable property. The longer that water/waste are allowed to remain in your home or on your property, the greater the potential for illness and irreparable damage to your home, its contents, and environs. *Where they may be operated safely, use of pumps and dehumidifiers will be helpful in restoring dry conditions.* In any flood cleanup project regardless of the source, **one should assume that pathogens are present and take appropriate precautions.**

The survival of pathogens depends on a number of factors: location (indoors vs. outdoors), season, type of surface contaminated, whether disinfectants are used, and also on environmental conditions such as humidity, temperature, and sunlight. Sunlight (UV radiation) reduces the survival rate of pathogens with numbers decreasing rapidly with increasing exposure to UV radiation. Mild temperatures and higher humidity in external situations result in longer survival times.

Prior to undertaking cleanup efforts, take proper precautions:

- Always wear protective gloves, eyewear, and boots. Rain gear is also advisable.
- Avoid direct contact with sewage material, and be particularly careful of your face and eyes. Goggles are recommended when using a hose and/or any chemicals.
- Protect all cuts and scrapes. Immediately wash and disinfect any wound that comes in contact with sewage.

The following steps should be taken to mitigate the microbial risk from a building contaminated with sewage:

Any excess water should be removed from the property by pumps, wet vacs, or mopping. Dehumidifiers and active ventilation should also be used when available.

- All solid waste should be collected and disposed.
- All upholstered furniture and mattresses should be discarded, other contaminated furniture should be removed and cleaned or discarded.
- The affected areas should be washed with a detergent solution to remove sewage-related contamination, then disinfected and allowed to dry.

Sort damaged contents to be repaired or discarded. Use the following guide relative to discarding of household material and furnishings.

#### **Usually Discard**

Foam rubber  
Large carpets  
Books and paper products

#### **Always Discard**

Food  
Cosmetics  
Medicines and medical supplies  
Stuffed animals  
Toys  
Mattresses and pillows  
Upholstered couches and chairs  
Carpet padding  
Cardboard

#### **BE CAREFUL**

- Assume anything touched by sewage is contaminated.
- Clean and disinfect everything sewage has touched.
- Always wear protective rubber gloves, eyewear, and boots and be especially careful if you have cuts or open sores.
- Wash, disinfect, or discard any clothing and supplies immediately after use.

#### **Disinfection**

Disinfectants are typically chemical agents that reduce significant numbers of pathogens to levels below those expected to cause disease. Cleaning and disinfection are two different processes. Cleaning removes the dirt. The processes of disinfection and decontamination are important to ensure the elimination of pathogens and organisms that were contained in the sewage or that grew during the period of contamination. Even concrete can be colonized and broken down by microorganisms if it is allowed to remain wet and contaminated by organic matter. Many household products are capable of disinfecting surfaces and should be used in accordance with manufacturer's label directions. A household bleach solution is also an effective disinfection agent, and can be made by combining one quarter cup of household bleach to one gallon of water. Bleach should never be used directly without dilution since, in this concentrated form, the bleach can cause severe skin and respiratory hazards.

To prepare surfaces for disinfection, wash surfaces first with warm soapy water and rinse surface. Apply the disinfectant solution to all areas of the affected surface, and allow for sufficient contact and drying time.

When proceeding with cleanup operations, remember that those individuals whose immune systems are in some way compromised or who are otherwise susceptible due to age, medication, or underlying illness, are considered to be at greater risk of contracting infections than those individuals who are healthy.

*If you decide you that you need professional help:*

- Look under "Carpet Cleaning", "Fire Restoration", or "Mold Abatement" in the telephone book. If you hire cleanup or repair contractors, be sure they are qualified to perform the job. Always check references and ask whether they are insured. Certification for these companies is not currently required or available in Massachusetts.
- Contact your local emergency management officials, to determine if there are resources available for assistance, or to get referrals for qualified contractors.

More detailed information on cleaning up after a flood event can also be found on the [Red Cross website](#).

### **Cleanup of External Areas**

The majority of the microbial population from sewage flooding onto lawns, tarmac and paved areas will be inactivated within several days due to exposure to UV radiation from sunlight. A disinfectant can be used on tarmac and paved areas. Contamination on grass could be left to degrade naturally. Typically, bacterial numbers on turf are reduced to background levels expected in the environment within 13 days, but can extend to 20 days on soil and sand in the autumn and spring. Generally, the least absorbent or pervious surfaces absorb the least sewer and bacterial concentrations and return to background levels the quickest.

### **References/Other Sources of Information**

Protecting Your Home from Flooding, FEMA, 1994  
Repairing Your Flooded Home, FEMA-234, 1992  
Flood Emergency and Residential Repair Handbook, FIA-13, 1986  
Retrofitting Flood-Prone Residential Structures, FEMA-114, 1986  
Protecting Building Utilities from Flood Damage, FEMA-348, 1999

To obtain copies of these and other FEMA documents, call FEMA Publications at 1-800-480-2520  
Information is also available on the World Wide Web: [Web site](#)

### **Other Internet Links**

[Red Cross - Repairing Your Flooded Home](#)  
[FEMA - Preparation & Prevention](#)  
[FEMA - Floods](#)  
[MEMA - What is a Flood?](#)  
[MA Department of Public Health - Storm Fact Sheet](#)

### **Disclaimer:**

The information provided is based on research and input from experienced professionals. The reader must assume responsibility for adapting this information to local conditions. This document should be used as a guide and is not intended to replace the advice and guidance of experienced professionals and public health officials who are able to view a home and assess the needs of the particular situation.

<http://www.mass.gov/dep/water/laws/flooding.htm>