

Dealing with Mold Problems After a Flood

What is mold and why can it be a problem after a flood?

Mold is a kind of microscopic fungus. There are many types of molds, and they are present throughout the environment, indoors and out. Tiny mold particles are always present in the air, in the form of tiny microscopic cells known as spores.

Mold spores can germinate and grow in a moist or damp environment, on any surface that contains organic matter. A home that's been flooded can provide ideal conditions for the growth and proliferation of mold.

Why is mold a health concern?

Indoor mold can trigger allergies or allergy-like symptoms affecting the upper respiratory system. Although other, more serious problems may occur if people are exposed to very high levels of mold, the most common complaints are:

- nasal and sinus congestion
- cough
- wheeze/breathing difficulties
- sore throat
- skin and eye irritation
- upper respiratory infections (including sinus infections)

The effect of mold on different people can vary widely. However, long-term exposure to high levels from indoor mold growth can eventually be unhealthy for anyone. The following groups of people may be at greater risk than others:

- infants, children and the elderly
- individuals with respiratory conditions or sensitivities such as severe indoor allergies and asthma
- persons with weakened immune systems (for example, people with HIV infection, chemotherapy patients, organ transplant recipients)

MDH recommends that you consult a medical professional if you feel your health is being affected by a moldy environment.

In addition to health complaints, mold damages building materials, goods, or furnishings when it grows on them. Mold growth and moisture may eventually compromise the building's structural integrity. Because of potential health concerns and damage to property, molds should not be allowed to grow and multiply indoors.

Finding a Mold Problem: Investigate — don't test.

After a flood, many people become convinced – often with the help of an aggressive salesperson – that **testing** is the best way to find out if you have a mold problem. That isn't necessarily true.

The most practical and reliable tools for detecting a mold problem are your eyes and nose. If you see something that looks like mold, or you detect an earthy or musty smell, you should assume a mold problem exists. The presence of moisture or worsening allergy-like symptoms can also tip you off to a mold problem.



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When you check for mold, be sure to:

- Look for visible mold growth (may appear cottony, velvety, granular, or leathery and have varied colors of white, gray, brown, black, yellow, green). Mold often appears as discoloration, staining, or fuzzy growth on the surface of building materials or furnishings.
- Search areas with noticeable mold odors.
- Look for signs of excess moisture or water damage. Look for water leaks, standing water, water stains, and condensation problems. For example, do you see any watermarks or discoloration on walls, ceilings, carpet, woodwork or other building materials?
- Search behind and underneath materials (carpet and pad, wallpaper, vinyl flooring, sink cabinets), furniture, or stored items. Sometimes destructive techniques may be needed to inspect and clean enclosed spaces where mold and moisture are hidden – opening up a wall cavity, for example. Be sure to use protective equipment and dust control methods described below.

MOLD TESTING: Expensive – and probably not helpful. People often have unrealistic expectations about what testing can accomplish, and are easily persuaded that it needs to be done. But mold testing is expensive, and it may or may not tell you what you need to know. Before you're tempted to have any testing done, try to check for possible mold problems on your own. The basic task is always to (1) find the location of any mold growth, and (2) determine the source of the moisture that's allowing the mold to grow.

If testing isn't really needed, or done properly, you may be wasting money that could be used to correct a mold problem. Under those circumstances, it's not a wise or cost effective way of dealing with the issue. *If you see or smell mold, you don't need to test for it; clean it up instead.*

Take Steps to Protect Yourself

People who have health problems or are very sensitive to mold should not do clean-up work in situations where there is heavy mold growth, or a high risk of disturbing materials contaminated with mold. People who are in poor physical condition should be extremely cautious about doing heavy work while wearing a respirator.

If you plan to enter a moldy environment, especially where moldy materials are being disturbed, you should use a respirator to protect your health. At a minimum, you should use an N95 or a N100 type disposable respirator. Greater respiratory protection may be more appropriate if you are sensitive to airborne contaminants, or, where mold growth is heavy or covers an extensive area. More protective options include half-face negative-air respirators with a HEPA filter (i.e., N100, P100) or supplied air respirators such as a powered air purifying respirator (PAPR).

The following precautions are recommended when working with moldy materials:

- Wear an "N-95" or a N100 type disposable respirator (available from safety equipment suppliers, hardware stores, or some building supply stores).
- Use rubber gloves
- Wear eye goggles that seal out fine dusts-like materials
- Wear outer clothing (long sleeved shirts and long pants) that can be easily removed before leaving the work area, and later laundered or discarded
- Do not eat, drink or smoke in the contaminated area, since disease-causing organisms from sewage or floodwater may be present.

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Clean-up and Removal of Mold: The basic steps

1. **Identify and remove any sources of moisture.** This is the most important – and the most basic – thing you need to do. Mold can't grow without moisture. And don't forget to look for sources of moisture that aren't related to the flood.
2. **Begin drying any and all materials that got wet.** Do this as soon as possible. After the floodwaters have receded, water-soaked building materials and household items can be a significant ongoing source of moisture, promoting the growth of mold. They should be rapidly dried or removed from the building if possible. For severe moisture problems, use fans and dehumidifiers, and move wet items away from walls and off floors. Check with equipment rental companies or restoration firms to see if you can rent fans and dehumidifiers. However, to avoid spreading mold spores, do not operate fans if visible mold is already present.
3. **Remove and dispose of mold-contaminated materials.** Look for mold on porous items that may have absorbed moisture— including sheet rock, insulation, plaster, carpet/carpet pad, ceiling tiles, wood (other than solid wood), and paper products. If you see evidence of mold, these items should be removed, bagged and thrown out. Porous materials that may have been in contact with sewage should also be bagged and thrown away. Non-porous materials can be saved if they are properly cleaned and dried and then kept that way.
4. **Clean non-porous or semi-porous items.** Mold can grow on materials like hard plastic, concrete, glass, or metal – but it can usually be removed with careful cleaning. Solid wood items can also be salvaged through cleaning, if they are structurally sound. Bear in mind that mold spores and particles can cause health problems even if they're dead. For that reason, when you clean an item, the objective is to capture and remove the mold contamination.
 - For heavily contaminated items, begin by using a HEPA vacuum (not a conventional household vacuum or shop vac) to remove as much contamination as possible.
 - If you can't get a HEPA vacuum, carefully damp wipe the item, to remove as much surface contamination as possible. Rinse wipes often with clean water. Dispose of your wipes and rinse water frequently and properly – they'll be contaminated with mold.
 - After HEPA-vacuumping or damp wiping, thoroughly scrub all contaminated surfaces. Use a stiff brush, hot water, and a non-ammonia soap/detergent or commercial cleaner.
 - Collect excess cleaner/cleaning water a wet/dry vacuum, mop or sponge.
 - Rinse the surface or item – and the clean-up area -- with clean water. Collect the excess rinse water, and dry everything as quickly as possible.
5. **Disinfect surfaces (optional).** After removing all visible mold and other dirt or soiling from contaminated surfaces, a disinfectant may be used to kill some of the mold that may still be present. Disinfection is not a substitute for cleaning and removal of mold. However, it's essential for items that have been in contact with sewage. If you disinfect, follow these guidelines, and contact the Minnesota Department of Health for additional advice:
 - Mix 1/4 to 1/2 cup bleach per gallon of water and apply to surfaces where mold growth was visible before cleaning. Apply with a spray bottle, garden sprayer, sponge, or some other suitable method.
 - Collect any run-off of the bleach solution with a wet/dry vacuum, sponge or mop. Do not rinse or wipe the bleach solution from the items or surfaces being treated—allow it to dry on the surface.

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Avoid Spreading Mold Contamination

As you plan and carry out your clean-up activities, take steps to avoid spreading mold spores:

- Enclose moldy items in plastic (bags or sheets) before you carry them out
- When transporting moldy materials, use the shortest path into and out of the building
- Hang plastic sheeting to seal off the work area
- Remove the outer layer of work clothes before leaving the work area. Bag contaminated clothes or wash them separately.
- Damp clean all surfaces in and around the work area to remove any fine dust.

Stay Alert for Problems– and be Patient about Rebuilding

Continue to look for signs of moisture or new mold growth. Pay special attention to areas where mold grew previously. If the mold returns, repeat the cleaning process, and consider using a stronger disinfecting solution. New mold growth may mean that the contaminated material should be removed, or that you still have a moisture problem.

Be patient about rebuilding your home, or getting new furnishings. Wait until everything has been completely cleaned and dried – and remember that drying out wet building materials may take a long time.

A WORD OF CAUTION ABOUT CLEANING AGENTS: Bleach and ozone.

Bleach should always be handled with caution. **Never mix bleach with ammonia.** Bleach can irritate the eyes, nose, throat, and skin. When working with bleach, always make sure the work area is well ventilated, and leave the area if your eyes or your breathing are affected. Use gloves and goggles to protect your skin and eyes. Also remember that bleach is very corrosive, and may damage some materials. Test a small area of the surface or item you're disinfecting, before you proceed.

Bleach alone is not an effective way to combat mold. It won't reliably kill mold, especially if organic contamination (dirt, dust, mold growth, etc.) has not been cleaned away first. Bleach consists mostly of water, so it can actually provide some of the moisture needed for the growth of mold. And finally, bear in mind that bleach treatment doesn't actually remove mold spores or particles.

Gas-phase ozone has also been promoted by some commercial firms as treatment for mold problems. Some firms also sell "air cleaning" devices that produce ozone. However, studies have shown that ozone – even at high concentrations – is not effective at killing airborne mold or mold contamination on household surfaces. Even if the ozone killed some of the mold, the health threats would remain until the mold contamination had been removed through cleaning.

In addition, ozone is a strong oxidizing agent and a **known irritant of the lungs and respiratory system**. Health experts—including officials at Minnesota Department of Health—**do not recommend** the use of ozone to address mold or any other indoor air problems.

For more information on mold and other indoor air quality issues, visit our Web site at:

www.health.state.mn.us/divs/eh/air/

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