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INDOOR AIR QUALITY

Mold in My Home: What Do I Do?

This fact sheet provides information to people who have experienced water damage to their home and presents the health concerns related to mold exposure. It also provides general guidelines on mold detection, cleanup and removal of mold contaminated materials.

This article is intended as a guide to community-oriented property management. It should not be regarded as legal or medical advice. If you need legal or medical advice, contact a skilled environmental attorney or environmental professional.

ABOUT MOLD

What is it? Molds are simple, microscopic organisms, found virtually everywhere, indoors and outdoors. Molds can be found on plants, foods, dry leaves, and other organic material. Molds are needed for breaking down dead material. Mold spores are very tiny and lightweight, and this allows them to travel through the air. Mold growths can often be seen in the form of discoloration, raising from white to orange and from green to brown and black. When molds are present in large quantities they can cause allergic symptoms similar to those caused by plant pollen.

Should you be concerned about mold in your home? Yes, if the contamination is extensive. When airborne mold spores are present in large numbers they can cause allergic reactions, asthma episodes, infections, and other respiratory problems for people. Exposure to high spore levels can cause the development of an allergy to the mold. Mold can also cause structural damage to your home. Similarly, when wood goes through a period of wetting, then drying, it can eventually warp and cause walls to crack or become structurally weak.

What does mold need to grow? For mold to grow, it needs:

1. Food sources - such as leaves, wood, paper, or dirt.
2. A source of moisture.
3. A place to grow.

Can mold become a problem in your home? Yes, if there is moisture available to allow mold to thrive and multiply. The following are sources of indoor moisture that may cause problems:

- a. Flooding
 - backed-up sewers
 - leaky roofs
- b. Humidifiers
 - mud or ice dams
 - damp basement or crawl spaces
 - constant plumbing leaks
 - house plants -- watering can generate large amounts of moisture
- c. Steam from cooking
 - shower/bath steam and leaks
 - wet clothes on indoor drying lines
 - clothes dryers vented indoors
- d. Combustion appliances (e.g., stoves) not exhausted to the outdoors

CAUTION: If you see moisture condensation on the windows or walls, it is also possible that you have a combustion problem in your home. It is important to have sufficient fresh air available for fuel burning, appliances, such as the furnace, water heater, stove/range, clothes dryer, as well as a fireplace. A shortage of air for these appliances can result in *back drafting* of dangerous gases such as carbon monoxide into the home. To prevent back drafting of air you need either open vents or a ventilation system that brings fresh air into the home to replace air that is exhausted out. ***Have your local utility company or professional heating contractor inspect your fuel-burning appliances annually.***

HEALTH EFFECTS

How are you exposed to indoor molds? Mold is found everywhere, indoors and outdoors. It is common to find mold spores in the air of homes and growing on damp surfaces. Much of the mold found indoors comes from outdoor sources. Therefore, everyone is exposed to some mold on a daily basis without evident harm. Mold spores primarily cause health problems when they enter the air and are inhaled in large number. People can also be exposed to mold through skin contact and eating.

How much mold can make me sick? It depends. For some people, a relatively small number of mold spores can cause health problems. For other people it may take many more. The basic rule is, if you can see or smell it, take steps to eliminate the excess moisture and to cleanup and remove the mold.

Who is at greater risk when exposed to mold? Exposure to mold is not healthy for anyone inside buildings. It is important to quickly identify and correct any moisture sources before health problems develop. The following individuals appear to be at higher risk for adverse health effects of mold:

1. Infants and children
2. Elderly
3. Immune compromised patients (people with HIV infection, cancer chemotherapy, liver disease, etc.)
4. Pregnant women
5. Individuals with existing respiratory conditions, such as allergies, multiple chemical sensitivity, and asthma

People with these special concerns should consult a physician if they are having health problems.

What symptoms are common? Allergic reactions may be the most common health problem of mold exposure. Typical symptoms reported (alone or in combination) include:

- o respiratory problems, such as wheezing, and difficulty in breathing
- o nasal and sinus congestion
- o eyes-burning, watery, reddened, blurry vision, light sensitivity
- o dry, hacking cough
- o sore throat
- o nose and throat irritation
- o shortness of breath
- o skin irritation
- o central nervous system problems (constant headaches, memory problems, and mood changes)
- o aches and pains
- o possible fever

Are some molds more hazardous than others? Allergic persons vary in their sensitivities to mold, both as to amount and type needed to cause reactions. In addition, certain types of molds can produce toxins, called *mycotoxins*, that the mold uses to inhibit or prevent the growth of other organisms. Mycotoxins are found in both living and dead mold spores. Materials permeated with mold need to be removed, even after they are disinfected with cleaning solutions. Allergic and toxic effects can remain in dead spores. Exposure to mycotoxins may present a greater hazard than that of allergenic or irritative molds. Mycotoxins have been found in homes, agricultural settings, food, and office buildings.

DETECTION OF MOLD

How can I tell if I have mold in my house? If you can see mold, or if there is an earthy or musty odor, you can assume you have a mold problem. Allergic individuals may experience the symptoms listed above. Look for previous water damage. Visible mold growth is found underneath materials where water has damaged surfaces or behind walls. Look for discoloration and leaching from plaster.

Should I test my home for mold? The *Delta-Schoolcraft-Menominee District Health Department* should be consulted on mold testing. Reliable sampling for mold can be expensive, and requires equipment not available to the general public. Residents of individual private homes must pay a contractor to carry out such sampling, as it is not usually done by public health agencies. Mold cleanup is usually considered one of the housekeeping tasks of the private citizen, along with roof and plumbing repairs, sweeping and house cleaning. Another problem is that there are few available standards for judging what is an acceptable quantity of mold. In all locations, there is some outdoor levels of molds. If sampling is carried out, an outdoor air sample needs to be taken at the same time as the sample indoors, to provide a baseline measurement. Since the susceptibility of individuals varies so greatly, sampling is at best a general guide.

The simplest approach is: if you can see or smell mold, you have a problem. Once you know the problem exists, follow the procedure given next.

Unless the source of moisture is removed and the contaminated area is cleaned and disinfected, mold growth is likely to reoccur.

GENERAL CLEAN-UP PROCEDURES

1. Identify and correct the moisture source.
2. Clean, disinfect, and dry the moldy area.
3. Bag and dispose any material that has moldy residues, such as rags, paper, leaves, or debris.

What can I save? What should I toss? Substances that are porous and can trap molds, such as paper, rags, wallboard, and rotten wood should be decontaminated and thrown out. Harder materials such as glass, plastic, or metal can be kept after they are cleaned and disinfected. Ultimately, it is critical to remove the source of moisture first, before beginning remedial action, since mold growth will return shortly if an effected area becomes re-wetted.

Removal of Moldy Materials After **fixing the** moisture source and removing excess moisture, the cleanup can begin:

- o Wear gloves when handling moldy materials
- o Remove porous materials (examples: ceiling tiles, Sheetrock, carpeting, wood products).
- o Carpeting can be a difficult problem -- drying does not remove the dead spores. If there is heavy mold, disposal of the carpet should be considered.
- o Bag and discard the moldy substances.
- o Allow the area to dry 2 or 3 days.
- o If flooded, remove all sheet rock to at least 12 inches above 3 the high watermark.
- o Visually inspect the wall interior and remove any other intrusive molds. (This step may have to be carried out by a licensed contractor or environmental professional).

CAUTION: Spores are easily released when moldy material is dried out.

SOAP CLEAN-UP

Before disinfecting contaminated areas, clean the areas to remove as much of the mold (and food it is growing on) as possible.

2. Wear gloves when doing this cleanup.
3. Use a non-ammonia soap or detergent, or a commercial cleaner, in hot water, and scrub the entire area affected by the mold.
4. Use a stiff brush or cleaning pad on block walls or uneven surfaces.
5. Rinse clean with water. A wet/dry vacuum or HEPA vacuum is handy for this.

Disinfect Surfaces

1. Wear gloves when using disinfectants.
2. After thorough cleaning and rinsing, disinfect the area with a solution of 10 % household bleach (e.g. 1 to 1 and ½ cups of bleach per gallon of water). **Using bleach straight from the bottle will not be more effective.**
- 3.** **Never mix bleach with Ammonia - the fumes are toxic.**
4. For spraying exterior large areas, a garden hose and nozzle can be used.
5. When disinfecting a large structure, make sure the entire surface is wetted (floors, joists, and posts).
6. Avoid excessive amounts of runoff or standing bleach.
7. Let disinfecting areas dry naturally overnight – this extended time is important to kill all the mold.

CAUTION: Bleach fumes can irritate the eyes, nose, and throat, and damage clothing and shoes. Make sure the working area is well ventilated.

Can cleaning up mold be hazardous to my health? Yes. Exposure to mold can occur during the cleaning stage. Mold counts are typically 10 to 1000 times higher than background levels during the cleaning of mold damaged materials. Take steps to protect your health during cleanup:

1. When handling or cleaning moldy materials, consider using a mask or respirator to protect you from breathing airborne spores. Respirators can be purchased from hardware stores. You should select one for particle removal. Respirators are not as effective removing bleach fumes, so minimize your exposure when using bleach or other disinfectants.
2. Wear protective clothing that is easily cleaned or discarded.
3. Use rubber gloves.
4. Try cleaning a small test patch of mold first. If you feel that this adversely affected your health, you should consider paying a licenced contractor or cleaning professional (environmental) to carry out the work.
5. Ask family members or bystanders to leave the area when being cleaned.
6. Work over short time spans and rest in a fresh air location.
7. Air your house out well during and after the work.

CAUTION: Never use a gasoline engine indoors (e.g. pressure washer, generator) -- you could expose yourself and your family to carbon monoxide.

Can Air Duct Systems Become Contaminated with Mold? Yes. Air duct systems can become contaminated with mold. Duct systems can be constructed of bare sheet metal, sheet metal with an exterior fibrous glass insulation, sheet metal with an internal fibrous glass liner, or made entirely of fibrous glass. If your home's air duct system has had water damage, first identify the type of air duct construction that you have. Bare sheet metal systems or sheet metal with exterior fibrous glass insulation can be cleaned and disinfected.

If your system has sheet metal with an internal fibrous glass liner or are made entirely of fibrous glass, the ductwork normally will need to be removed and discarded. Ductwork in difficult locations may have to be abandoned. If you have other questions, contact an air duct cleaning professional or licensed contractor.

After I've cleaned everything as thoroughly as possible, can I still have mold odors? Yes. It is possible that odors may persist. Continue to dry out the area and search for any hidden areas of mold. If the area continues to smell musty, you may have to re-clean the area again (follow the cleaning steps given in this sheet). Continue to dry and ventilate the area. Don't replace flooring or begin rebuilding until the area has dried completely.

How can further damage to my home be prevented? Check regularly for the following:

- o moisture condensation on windows
- o cracking of plasterboard
- o drywall tape loosening
- o wood warping
- o musty odor

If you see any of the above seek out and take steps to eliminate the source of water penetration as quickly as possible.

USEFUL PUBLICATIONS

Biological Pollutants In Your Home, 1990. Available from local ALA or U.S. EPA's IAQINFO. Concise booklet aimed at concerned or affected homeowner

Mold, Moisture & Indoor Air Quality: A Guide to Designers, Builders, and Building Owners, 1994. Available from Building Science Corp. (978) 589-5100 or info @building science.com.
1994. Available from Building Science Corp. (978) 589-5 1 00 or info@buildincscience.com.

Moisture, Mold and Mildew in Building Air Quality (Appendix C), 1991. Available from the U.S. EPA's IAQINFO. Illustrative and useful resource guide.

Repairing Your Flooded Home. Available from American Red Cross and FEMA offices. Excellent resource with details on technical and logistical issues.

Clean-up Procedures for Mold in Houses. Available from Canada Mortgage and Housing Corp.

Factsheet on Stachybotrys atra (chartarum). CDHS Environmental Health Investigations Branch, April 1997.

This info sheet includes materials provided through the courtesy of the Minnesota Department of Health Indoor Air Program and the Wayne County Health Department