Indoor Air Quality *Info Sheet*
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 & removal of mold contaminated materials

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, ranging 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 I be concerned about mold in my 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:

! food sources - such as leaves, wood, paper, or dirt
! a source of moisture
! a place to grow

Can mold become a problem in my 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:

! flooding
! backed-up sewers
! leaky roofs
! humidifiers
! mud or ice dams
! damp basement or crawl spaces
! constant plumbing leaks
! house plants -- watering can generate large amounts of moisture
! steam from cooking
! shower/bath steam and leaks
! wet clothes on indoor drying lines
! clothes dryers vented indoors
! 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 a professional heating contractor inspect your fuel-burning appliances annuall*y.

HEALTH EFFECTS

How am I 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 numbers. 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 molds:

! Infants and children
! elderly
! immune compromised patients (people with HIV infection, cancer chemotherapy, liver disease, etc.)

- pregnant women
- 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:

- respiratory problems, such as wheezing, and difficulty in breathing
- nasal and sinus congestion
- eyes-burning, watery, reddened, blurry vision, light sensitivity
- dry, hacking cough
- sore throat
- nose and throat irritation
- shortness of breath
- skin irritation
- central nervous system problems (constant headaches, memory problems, and mood changes)
- aches and pains
- 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 *mycotoxin*s, 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 Arizona Department of Health Services does not recommend testing as the first step to determine if you have a mold problem. 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 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 an acceptable quantity of mold is. In all locations, there are 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 recur.**

GENERAL CLEAN-UP PROCEDURES

- Identify and correct the moisture source
- Clean, disinfect, and dry the moldy area
- 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, carpet, 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 affected area becomes re-wetted.

Removal of Moldy Materials

After fixing the moisture source and removing excess moisture, the cleanup can begin:

- Wear gloves when handling moldy materials
- Remove porous materials (examples: ceiling tiles, sheetrock, carpeting, wood products)
- 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
- Bag and discard the moldy substances
- Allow the area to dry 2 or 3 days
- If flooded, remove all sheetrock to at least 12 inches above the high water mark. Visually inspect the wall interior and remove any other intrusive molds. (This step may have to be carried out by a licensed contractor).

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

Soap Cleanup

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

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

Disinfecting Surfaces

- Wear gloves when using disinfectants
- After thorough cleaning and rinsing, disinfect the area with a solution of household bleach and water.
- The CDC recommends using no more than 1 cup of bleach per gallon of water. Using bleach straight from the bottle will not be more effective
- **Never mix bleach with Ammonia or other cleaners -the fumes are toxic**
- For spraying exterior large areas, a garden hose and nozzle can be used
- 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 by going to the EPA web site at http://www.epa.gov/mold/mold_remediation.html
- Avoid excessive amounts of runoff or standing bleach
- Let disinfecting areas dry naturally overnight -- this extended time is important to kill all the mold.
- EPA and OSHA do not recommend the use of bleach when cleaning up mold, except as needed for immuno-compromised individuals. They recommend using only a detergent and water solution in most circumstances (EPA: http://iaq.custhelp.com/cgi-bin/iaq.cfg/php/enduser/std_adp.php?p_faqid=3044 OSHA: http://www.osha.gov/dts/shib/shib101003.html)

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

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:

- Seal off the moldy material from the other areas.
- 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; select one for particle removal (sometimes referred to as a N95 or TC-21C particulate respirator). Respirators are not as effective removing bleach fumes, so minimize your exposure when using bleach or other disinfectants.

- Wear protective clothing that is easily cleaned or discarded
- Wear eye protection
- Use rubber gloves
- Try cleaning a small test patch of mold first. If you feel that this adversely affected your health, you should consider paying a licensed contractor or professional to carry out the work
- Ask family members or bystanders to leave areas when being cleaned.
- Work over short time spans and rest in a fresh air location.
- 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:

- moisture condensation on windows
- cracking of plasterboard
- drywall tape loosening
- wood warping
- 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.

Can Ozone air cleaners help remove indoor mold, or reduce odor or pollution levels?

Some air cleaners are designed to produce ozone. Ozone is a strong oxidizing agent used as a disinfectant in water and sometimes to eliminate odors. However, ozone is a known lung irritant. Symptoms associated with exposure include cough, chest pain, and eye, nose, and throat irritation. Ozone generators have been shown to generate indoor levels above the safe limit. Furthermore, it has been demonstrated that **ozone is not effective in controlling molds and fungi,** even at high concentrations far above safe health levels. Also, ozone may damage materials in the home. For these reasons, **the Arizona Department of Health Services strongly recommends that you do not use an ozone air cleaner in any occupied residential**

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For inside Arizona calls only
(800) 367 – 6412

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. 617-323-6552.

***Moisture, Mold and Mildew* in *Building Air Quality* (Appendix C),** 1991. Available from 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 & logistical issues.*

Clean-up Procedures for Mold in Houses. Available from Canada Mortgage & Housing Corp. 800-668-2642. *Effective, hands-on information for affected homeowner.*

NIOSH Warns of Hazards of Flood Cleanup Work. National Institute of Occupational Safety and Health (NIOSH) Update. *Aimed at flood emergency workers.* 800-356-4674.

Factsheet on Stachybotrys atra (chartarum). CDHS Environmental Health Investigations Branch, April 1997. *Summarizes information on S.A. and includes NYC recommendations for evaluating and remediating microbial contamination.*

REFERRALS TO OCCUPATIONAL & ENVIRONMENTAL CLINICS

American College of Occupational & Environmental Medicine.
847-818-1800;
http://www.acoem.org.

FOR FURTHER HELP OR INFORMATION:

American Red Cross
Tel: 602-336-6660 or call local chapter
American Red Cross Western area Headquarters: 602-728-9663

U.S. EPA's IAQ Information Clearinghouse (IAQ INFO)
Tel: 800-438-4318 or 202-484-1307
Phone assistance (9 am to 5 pm, EST)
http://www.epa.gov/iaq/

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