



Frequently Asked Questions Regarding Mold

Mold and its health effects

1. Q: What is mold?

A: Mold is an all-encompassing term to describe the growths such as fungi, mushrooms, rusts, mildew, and yeast. Molds typically reproduce by means of spores. There are an estimated 100,000 accurately described species of fungi and at least as many species waiting to be discovered. Almost all of these fungi are aerobes, meaning they require oxygen to survive. They do not ingest their food but rather absorb nutrients by attacking dead organic matter or parasitizing living organisms. Many live in the soil and take an active part in the decomposition of organic matter. Unfortunately, many porous building materials such as drywall, wallpaper, and insulation are either constructed of, or contain some type of organic material.

2. Q: Where is mold found in the environment?

A: Molds (or fungi) are everywhere in the environment. They only require standing water or humidity levels greater than 60% and a source of nutrients (such as dirt, cellulose, drywall, etc.) to grow. In addition, temperature plays a role. Molds can grow in temperatures ranging from 32--95 °F, but grow best at 77--86 °F. Since nutrients are readily available in the environment, when there is water present for more than 48 hours or high humidity levels, mold is likely to grow.

3. Q: What are the common symptoms of mold exposure?

A: According to the study *Damp Indoor Spaces and Health* (National Institute of Medicine, 2004), in which scientists reviewed the body of published scientific literature regarding exposure to damp indoor environments (including the presence of mold) and health outcomes, there is sufficient evidence of an association (but not a causal relationship) between exposure to mold and/or damp indoor environments and the following symptoms:

- Upper respiratory (nasal and throat) tract symptoms
- Cough
- Wheeze
- Asthma symptoms in sensitized asthmatic persons

In addition, the report found inadequate scientific evidence to determine whether an association exists between any other health symptoms and mold exposure.

4. Q: Are there government health standards for exposure to mold?

A: There aren't any government health standards to indicate what is considered an elevated exposure to mold.

5. Q: Why is it difficult to quantitate an exposure concentration of mold that will cause health effects in individuals?

A: It's difficult to quantitate an exposure concentration of mold that will cause health effects in individuals, because the health effects of mold exposure experienced by most individuals are allergic in nature. Consequently, if you are allergic to mold you may have symptoms. Typically, very small quantities of allergens elicit an allergic response in individuals; it can vary by individual. It would be difficult to devise a health standard that would be applicable to both allergic and non-allergic people. The challenges would be similar to developing a health standard for dog dander or peanut allergens. The vast majority of people who aren't allergic to mold have no problem being exposed to low concentrations of mold.

6. Q: Is there such a thing as "toxic" mold?

A: You may have seen media reports about "toxic mold" and seen vivid pictures on television news shows of homeowners burning down their houses because they were infested with "toxic mold". Most of these reports specifically refer to a black mold called *Stachybotrys* (stak-e-bot-ris). You might ask, "Is toxic mold really a problem for the average homeowner?"

Many types of mold besides *Stachybotrys*, even common ones such as *Penicillium* (bread mold), produce mycotoxins, which are chemical toxins or poisons. The mycotoxins serve an important purpose for the mold organism: they help ward off other molds and bacteria so they don't occupy the mold's space. Molds derive their nutrients from the substrate upon which they're located, so the production of mycotoxins is an important survival mechanism for molds. There has been speculation, especially in the media, that these mycotoxins are responsible for causing some severe toxic health effects in humans, such as mucous membrane irritation syndrome, inhalation fevers, skin symptoms, gastrointestinal tract problems, bleeding lungs, and fatigue.

In addition to these more severe symptoms potentially caused by mycotoxins, mold is associated with three other types of adverse health effects:

- 1) Infections, which are primarily experienced by immune compromised individuals, such as those who have undergone cancer treatment, or AIDS patients;
- 2) Irritant effects due to organic compounds and odors off gassing from the molds; and
- 3) Allergic effects, which are experienced by individuals specifically allergic to mold.

However, research has shed more light on this issue. The Institute of Medicine, in its 2004 report, Damp Indoor Spaces and Health, evaluated the strength of the available scientific evidence concerning possible associations between damp or moldy environments and health outcomes. The review focused on only the allergic and toxic health effects of mold and did not concern itself with the infectious or irritant health effects. The Institute of Medicine committee concluded after an exhaustive literature review that there was not sufficient evidence to determine whether damp or moldy environments are associated with the toxic health effects caused by mycotoxins, such as mucous membrane irritation syndrome, inhalation fevers, skin symptoms, gastrointestinal tract problems, bleeding lungs, or fatigue.

The committee concluded there was sufficient evidence of an association between exposure to damp indoor environments and nasal and throat symptoms, cough, wheeze, and asthma in sensitized asthmatic persons. These symptoms constitute the allergic health effects associated with mold exposure. The committee felt there was limited or suggestive evidence of an association with asthma development.

So, in a nutshell, currently there is no scientific evidence to suggest that mold causes those severe toxic health effects that the media reports have suggested, such as mucous membrane irritation syndrome, inhalation fevers, skin symptoms, gastrointestinal tract problems, bleeding lungs, or fatigue.

Testing for Mold

7. Q: How is mold sampled?

A: It depends on what the client is trying to determine. If they want to know the types and concentrations of fungi to which they are being exposed in their home, or if they want to know if they have elevated mold growth in their home, they should do air sampling. To do air sampling, samples are collected indoors and compared to outdoor samples. Sampling media is attached to a sampling pump. A known quantity of air is pulled through the pump. Hence a concentration in spores per cubic meter of air can be determined.

If a client wants to know if a certain material that is discolored is actually mold, bulk or swab samples would be collected. Bulk samples are preferable over swab samples, because the sampler is more likely to collect all the fungi spores present in the material. One downside of bulk sampling, however, is it is destructive in nature, meaning a portion of the sampled material is cut out and sent to the lab. Hence if you're dealing with expensive family heirlooms, swab sampling, which is not destructive, is best.

8. Q: Is air sampling recommended?

A: We generally do not recommend air sampling for mold spores, because of the potential for getting "false negatives". False negative results occur because of how mold spores are generated. The mold organism casts off the mold spores in blooms; it is difficult to predict when this is going to happen. Once the spores are in the air, they eventually settle onto the ground and other horizontal surfaces, such as furniture. We don't know how long this takes; it depends on how much activity is occurring in the area, air currents, etc. Air is typically sampled for 5 minutes at the most, so there is a possibility of not collecting the mold spores while they are suspended in the air.

Adams County Health Department (ACHD) does conduct air, bulk and swab sampling for mold. Oftentimes, clients request our services when they are involved in a lawsuit

or workers compensation case, or want to know if the material they are seeing in their home is actually mold.

9. Q: How much does it cost for ACHD to sample?

A: The cost varies depending on the number and types of samples you are collecting. The collected samples are analyzed by a laboratory that participates in the Environmental Microbiology Proficiency Analytical Testing Program (EMPAT) sponsored by the American Industrial Hygiene Association. If you are interested in pricing, contact the TCHD Administration office: 720-200-1670.

10. Q: I see something in my home that I think is mold, how do I know?

A: A member of the ACHD Industrial Hygiene Program can do bulk or swab sampling, which identifies if the material is mold, as well as the type (genus) of mold. There is a cost for this service. A quick check homeowners can do if they see a fuzzy growth which they think is mold (sometimes this is really a mineral deposit) is to place a sample of the material in a clear glass of water and shake. If the white material dissolves, it probably is a mineral deposit. If it does not dissolve, it MAY be mold.

11. Q: How do I find a company to do mold sampling in my home or business?

A: Look for a Certified Industrial Hygienist to conduct mold sampling. Search under “Indoor Air Consultants” in the Yellow Pages online website.

12. Q: Can you just come out to my home and document that I have mold without sampling?

A: Without sampling we can only document that there is “suspected mold visible” or “evidence of water damage”.

Cleaning up Mold

13. Q: How do I clean up mold?

A: To clean up the mold, first you need to stop the water infiltration into the area. This is imperative; *mold will continue to grow as long as it remains wet*. After you stop the water infiltration, you should physically remove any large quantities of visible mold. Then you need to dry the area with fans, being careful to not distribute the mold spores to the occupied area of the home. Consequently, you may need to contain the contaminated area with plastic sheeting. Once it is dry, a detergent should be used to clean up the mold. You should not use anything to apply the detergent that will disturb the spores, such as a garden hose.

If you've got a large area to clean up (>10 ft²), you should consider hiring a mold remediation company to do it, because the furnace vents should be sealed with plastic, as well as the doorways to the rest of the house. High-Efficiency Particulate Air (HEPA) filter respirators should be worn, etc. The names of mold remediation companies are available by searching in the online Yellow Pages under terms such as “mold remediation” and “mold removal”. A helpful brochure is the Environmental Protection Agency (EPA) brochure [A Brief Guide to Mold, Moisture, and Your Home](#) or the ACHD brochure, [Homeowner's Guide to Moisture Management](#).

If you would like more information on the recommended methods mold remediation contractors should use when cleaning up your home, consult the EPA brochure [Mold Remediation in Schools and Commercial Buildings](#). Although it was written for schools and commercial buildings, the concepts apply to the home setting as well.

14. Q: I've cleaned up this mold as described in question 13 and it keeps coming back. What should I do?

A: Anything densely porous (drywall, insulation, carpet padding) needs to be removed and replaced. The only way to clean up mold long term is to remove the moisture. These materials cannot be dried out thoroughly. Also, if you continue to have moisture leaks, you will continue to have mold.

15. Q: Can I use chemicals or biocides such as chlorine bleach to clean up mold?

A: The purpose of mold remediation is to remove the mold to prevent human exposure and damage to building materials and furnishings. It is necessary to clean up mold contamination, not just to kill the mold. Dead mold is still allergenic, and some dead molds are potentially toxic. The use of a biocide, such as chlorine bleach, is not recommended as a routine practice during mold remediation, although there may be instances where professional judgment may indicate its use (for example, when immune-compromised individuals are present). In most cases, it is not possible or desirable to sterilize an area; a background level of mold spores will remain in the air (roughly equivalent to or lower than the level in outside air). These spores will not grow if the moisture problem in the building has been resolved.

If you choose to use disinfectants or biocides, always ventilate the area. Outdoor air may need to be brought in with fans. When using fans, take care to not distribute mold spores throughout an unaffected area. Biocides are toxic to humans, as well as to mold. You should also use appropriate personal protective equipment (PPE) and read and follow label precautions. **Never mix chlorine bleach solution with cleaning solutions or detergents that contain ammonia; toxic fumes could be produced.**

16. Q: Can you recommend a company to clean up my mold and water damage?

A: Companies that do this type of remediation are available by searching in the online Yellow Pages under terms such as "mold remediation" and "mold removal".

17. Q: Do you have any general information on mold (especially guidelines on cleanup) that you could mail or fax to me?

A: For general information on mold see the EPA brochure [A Brief Guide to Mold, Moisture, and Your Home](#). The EPA brochure also covers health effects. If you would like guidelines on clean-up, especially the procedures mold remediation contractors should use when cleaning up your home, consult the EPA brochure [Mold Remediation in Schools and Commercial Buildings](#). Although it was written for schools and commercial buildings, the concepts apply to the home setting as well.

Other questions

18. Q: I have mold in my shower, should I be concerned?

A: You don't need to be concerned about the health risk associated with small amounts of mold that you may find in your bathrooms. The "average" person, (who is not allergic to mold, is not asthmatic, and is not immune-compromised) has developed immunity to these small amounts of mold.

19. Q: I smell a musty odor, do I have mold?

A: Almost certainly. A musty odor is indicative of mold growth. You should look in the areas where the odors are and look for signs of water and mold. In order for mold to grow, standing water for 48 to 72 hours is needed or high humidity levels (above 60% Relative Humidity). Therefore, if you have had standing water or a water leak for more than a few days, you probably have mold growth. If you see mold, correct the problem causing the water intrusion. If you see mold, you should clean it up (see question #13).

20. Q: I have plastic down in the crawlspace covering the dirt. Should I leave it?

A: Plastic on top of the soil traps naturally occurring moisture in the soil underneath the plastic, where the moisture may condense. Mold will grow underneath the plastic on top of the soil, because the dirt will provide the necessary nutrients, and the condensation on the plastic provides the necessary moisture for mold to grow. So to be effective in stopping mold growth from traveling to the air in the crawlspace and beyond to the occupied portions of the home, the plastic needs to be completely sealed to the foundation walls. In addition, any gaps between sheets of plastic must be sealed. This will prevent the mold spores from traveling through the crawlspace air and into the occupied areas of the home. Also, to be effective, continuous ventilation of the crawlspace is necessary.

For additional information

21. Q: Can you give me some websites to get more information on mold and water damage?

A: www.emlab.com
www.epa.gov/mold/index.html
www.pathcon.com
www.doctorfungus.org