



G1819

Healthy Homes: Should I Test for Mold?

This publication discusses common questions consumers may have about testing for mold in homes.

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The answers to the following questions will help in decision making about whether to test for mold. Testing for mold generally is not recommended by most agencies, including the Environmental Protection Agency, American Industrial Hygiene Association and others. The reasons are discussed in this publication.

Molds are a natural part of our environment and are always present inside and outside. Human sensitivity to mold varies. Routine cleaning, ventilation, stopping water leaks and managing humidity levels will reduce and help to control mold. Keep relative humidity levels between about 35 percent and 50 percent. Mold spores can grow at levels above 60 percent relative humidity.

Do I need to test for mold?

Testing for mold is not needed for appropriate cleanup methods. If you can see mold or if there is a musty or earthy odor, you have mold. The moisture source needs to be stopped and the mold SAFELY cleaned up.

Knowing the types of mold does not change the methods used to clean it up and to prevent mold from further growth. Currently, there are no regulatory standards for what the mold spore levels should be.

Are there times when testing may be needed?

Testing may be needed if:

- requested by a health professional related to an illness of someone in the home
- needed for legal purposes or if litigation is involved or anticipated
- the source of the problem or location is not clear and testing may help locate the source or problem area.

Some professional mold cleanup businesses will want to test the spore levels before and after cleanup to determine if the spore levels have decreased.

What is the normal spore count for a home?

At the present time, there are no thresholds or regulatory standards set by the U.S. Environmental Protection Agency and other federal agencies for dangerous spore exposure level of molds or for mold mycotoxins in residential housing.

Due to the large number of molds, which are estimated to number more than 100,000 types, and due to the differences in people's reactions to mold, no exposure limits have been set.

When businesses provide the testing information, they may rely on what they and other businesses have seen throughout their experiences in testing.

Don't I need to know the types of mold present?

Whatever types of molds are present, all mold should be treated with respect and with safe procedures. Some people have problems with some kinds of molds and not others. Individuals vary in their sensitivity to different types of molds. You do not know for sure if the molds present might cause health problems.

Personal protective equipment and SAFE procedures are recommended for all mold cleanup regardless of the mold type. Knowing the types of mold does not change the methods used to clean it up and to prevent mold from further growth.

The moisture source must be found and corrected. The mold is then SAFELY cleaned up. If the moisture source is not corrected or repaired, the mold will come back.

Managing mold includes:

1. maintaining relative humidity levels below 60 percent- 35 percent to 50 percent the optimum range of relative humidity levels
2. correcting sources of water leaks or moisture
3. increasing air circulation and light
4. reducing organic substances like soil

5. keeping the area with mold and mold spores contained to prevent spores from spreading to the rest of the house
6. removal of porous materials that are contaminated with mold and cleaning contaminated nonporous hard surfaces with detergent and water to remove mold
7. a thorough cleanup and then vacuuming using a quality HEPA (high efficiency particle air) filter vacuum
8. continuing to monitor the area for moisture problems or recurring mold

What types of molds are commonly found in houses?

The mold genus and species vary somewhat depending on the environmental situation. Examples of common household molds include:

Genus	Number of Species Known
Alternaria	40-50 species
Aspergillus	185-200
Aureobasidium	14
Chaetomium	80-90
Cladosporium	20-40
Epicoccum	2
Fusarium	50-70
Mucor	50
Penicillium	200
Stachybotrus	15
Trichoderma	20
Ulocladium	9
<i>Source: Samson, (1999)</i>	

Should I discuss mold problems with a qualified health professional?

Is someone in the household having a health problem that might be related to mold? Does the person appear to get better when spending time away from the home? Has a medical professional discussed any illnesses that might be related to air quality or mold?

Discuss any existing health problems that the medical professional may suspect is linked to an air quality or mold problem in the home. Discuss whether identification of mold will be of any help in addressing a health issue. Mold testing cannot prove that there is no mold problem or that mold is the cause of health problems.

If testing is done, how are samples to be taken?

Laboratory test samples may be wet or dry samples, bulk product samples, air samples or a combination depending on the sampling procedure used. Mold particles can be suspended in air, in settled dust or growing on surfaces. Mold tests give a partial estimate of the amount of types of molds collected in a sample or in the

environment. Tests are like a snapshot in time. The sample may not be representative of the actual conditions. A few labs and businesses may travel to homes to conduct tests and charge for the travel.

Typically, indoor mold concentrations are compared to outdoor concentrations at the same location. When indoor concentration levels are higher than outdoor concentrations or significantly different in the mold types that are predominant, the house or building is said to have a mold problem. However, there are certain times of the year when outdoor levels may be abnormally low or high and climates and environmental conditions will vary. Several types of mold spores are present at all times in our indoor and outdoor environments at a background level.

Sometimes the areas that appear problematic or have visible mold are compared to samples taken in other areas of the home that do not appear to be a problem.

The skill and knowledge of the sampler are critical in getting the type of information that may be needed.

The consumer needs a clear understanding of the cost and typical outcomes. Will the information be interpreted so that the householder might understand the source of and type of problem and what the results mean?

Provide basic information to the lab about the mold present and the area, as well as other known information. Ask the lab professionals if they think testing is important in the particular situation, what type of information they will provide as a result, and how much it will cost.

How many samples are needed?

Multiple samples are suggested. However, the samples originally collected may or may not contain the spores or the molds that may be a potential problem in the home or for the individual. Some of the molds may not be captured in the samples because they are not visible for swab samples or the spores are not in the airborne stage. Some spores settle out more readily than others. Large variations in air particles also occur in homes due to air flow, air pressure differences and ventilation. These changes can occur relatively quickly and can change the sample results.

In some cases, the samples may be insufficient. A mold that might be the potential problem might not be a primary part of the sample sent to the laboratory. Some molds may be growing hidden from view. They may grow behind bathroom walls, underneath a leaky toilet or near condensation on pipes hidden in the walls.

To obtain airborne mold spores, air sampling usually is done. For existing surface growth, bulk sampling, swab or tape are often used. If mold is thought to be a problem, multiple types of testing are used such as air and swab sampling.

What is the cost of testing?

Costs vary depending on the type of samples. Swab samples taken by the consumer and sent to a lab will be less expensive than if a technician must travel to the home and take the air and swab samples. Some companies report costs for taking samples in homes and identifying them at \$1,000 to \$1,500.

How are the results shared by the lab? Will the results be interpreted?

The results provided will vary. Laboratory testing results may come back in a form that consumers cannot interpret. Other labs will provide a measure and interpretation, as well as educational information about the molds.

There are many types of common household molds. Labs may identify the mold genus but not the species based on the sample(s) sent to the lab. Remember that there are no federal or state standards as to what should be an appropriate mold spore level in homes.

Don't I want to test to see if the mold is that black toxic mold?

Many molds are capable of producing mycotoxins in addition to what is commonly heard in the media as the toxic mold *stachybotrus*. Molds can produce toxins in certain stages of their growth but it depends on their environmental conditions. Mold also can result in other health problems such as an irritation, allergy, infection or inflammation. Many molds are black, grey or charcoal in color. Thus, all molds should be treated with safety procedures and safely removed.

Knowing the types of mold present is not needed to determine the appropriate cleanup method.

What other issues should I consider?

Molds commonly are found indoors and out and are an important part of our environment. Mold helps break down organic materials such as leaves and debris. A certain level of mold spores will be present indoors and outdoors at all times.

Some people are affected by some molds but not others. Some people are affected as the mold level increases such as when flooding occurs or during high relative humidity levels.

The age and health of the person may be a factor as well as the length of time spent in the home and where in the home that time is spent. Infants, young children, those with health problems or respiratory problems, those with compromised immune systems, and the elderly are more likely affected by molds than others.

Any mold should be treated with caution, and SAFE procedures used in the cleanup.

Safety procedures must be followed, including protecting the lungs and eyes by wearing protective clothing, gloves, an appropriate air filter mask (N-95 mask, half or full face HEPA air filter mask or respirator) and goggles. Children, pregnant women, those with respiratory problems, compromised immune systems, and the elderly should not be present or involved.

Consumers must decide the degree of risk they are willing to take especially if a mold problem is extensive. When the mold area is greater than 10 square feet, professional cleanup is recommended.

Great care should be exercised in removing and disposing of all products that have been contaminated by mold. For example, removing wall coverings with mold behind them may disperse the mold spores into the air. Take precautions to prevent spreading the mold. For a thorough discussion of mold cleanup, go to www.epa.gov/mold/ and click on *Mold Remediation in Schools and Commercial Buildings*. Although this reference addresses large buildings, the same procedures are recommended for homes.

What types of labs do mold testing?

Check local and area Yellow Pages under laboratory testing or environmental labs. Some labs are accredited by the Environmental Microbiology Laboratory Accreditation Program (EMLAP). EMLAP is designed for labs identifying microorganisms commonly detected in air, fluids and bulk samples during indoor air quality studies. Some states have few or no labs that conduct air quality and mold sampling and testing. Existing mold cleanup companies in the state may conduct the sampling and send the samples to labs in other states.

Contact the labs for a comparison of the types of molds they may test for, the process, how the results are provided to the consumer and the cost of each sample. Ask about their current accreditation, proficiency testing, experience and qualifications of those doing sampling and lab work.

The American Industrial Hygiene Association also has a listing of accredited labs at www.aiha.org. Accreditation by the American Industrial Hygiene Association (AIHA) is not a guarantee of the validity of the data generated by a laboratory.

Summary

There are several reasons why testing for mold is generally not recommended. This is especially the case when dealing with a small area of contamination. The source of the mold problem and moisture usually can be detected by a thorough visual inspection. Find the location of the mold growth and determine the source of the moisture. Stop the moisture source. Safely clean the mold contaminated area or have it cleaned.

Resources

American Industrial Hygiene Association. *The Facts about Mold*. www.aiha.org. Accessed 2/24/2007.

Davis, P. (2001, March). *Molds, Toxic Molds, and Indoor Air Quality*. CA Research Bureau, CA State Library. ISBN: 1-58703-133-7.

Natural Resources Defense Council. <http://www.nrdc.org/health>.

www.nrdc.org/health/effects/katrinadata/mold.asp. Accessed Feb. 24, 2007.

Sampson, R. A. (1999). Ecology, detection and identification problems of moulds in indoor environments. In Johanning (Ed.), *Bioaerosols, fungi and mycotoxins: Health effects, assessment, prevention and control*. New York: Mount Sinai School of Medicine.

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