

# MOLD: To Test or Not To Test – That Is the Question

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Let me start off by saying that I am not a mold specialist, nor do I test for mold. In fact, home inspectors are not even allowed by the NC Home Inspection Licensure Board to call a substance mold unless they are experts in the field. We can and do use the words mold-like substances even if it's obviously mold. However I did study microbiology in high school and college and my first major was medical lab technician. I am familiar with mold and other micro-organisms and have worked with them extensively. Now as a licensed home inspector I work closely with real estate professionals in the transaction of homes. There is a lot of misconception about mold as it relates to homes and this article is an attempt to clear up the confusion.

My hope is to give you a better understanding of the research on mold; the health effects, what it does to homes and what should be done if it is found. I hope to clear up questions you might have about how moisture, mildew and mold can complicate home sales. I hope to give you enough information from the experts so you can understand how unfair the lawsuits are that have been in the news. To me, the real threat in homes is the long term effects of moisture and mold which is structural issues due to rot.

From my research as well as my personal opinion, mold testing is not necessary. When mold, or mold like substances are found in a home by a home inspector, it shouldn't be a deal breaker even if the inspector/tester thinks it should be. Let me share with you the conclusions of the experts on the subject so you will have a better understanding of what you are facing when you encounter mold or mold like substances or shall we just call it all – fungus.

Here are the basics about mold:

Molds are decomposers of dead organic material such as leaves, wood and plants. Without mold, we would find ourselves wading deep in dead plant matter. And we wouldn't have cheese and some medicines without mold. But mold needs water to grow; without water mold cannot grow. In order to reproduce, molds produce spores, which spread through air, water and by insects. These spores act like seeds and can form new mold growth if the conditions are right. Think of spores as dandelion seeds on a microscopic

level. A little air movement and they're everywhere hoping to land where they can grow. It's important to realize that mold spores are present everywhere, in outside air as well as indoor air. They just don't grow unless the conditions are right.

Since mold needs moisture to grow, here are a few things to look for around your house.

The sprinkler system too close to the house

Downspouts and the ground sloping toward the house

A watered garden too close to the house

Then there are less obvious sources of moisture in a house you may not see right away that would be picked up during an inspection. Things like:

Moisture movement through exterior walls from things such as:

- Poor caulking and paint

- Poor flashings

- Poor shingles

- Poor thresholds

Interior rooms excluded from air circulation like closets

Poor attic ventilation trapping moisture in the attic

Humid summer air condensing on cooler crawl space surfaces when there is no vapor barrier present

Moisture wicking up through the slab if the builder didn't provide a vapor barrier

High humidity from showering, cooking, etc.

Plumbing leaks

Any break in the synthetic stucco envelope

Think about this. It only takes 24 to 48 hours for mold to develop. How often do today's homeowners check their crawl space and attic to make sure there are no leaks? Some areas where mold develops, like a broken pipe in a wall or ceiling, are more obvious and are picked up early enough to make repairs before there's much damage. Others like faulty bathroom caulk which allows moisture into the structure over a long period of time, can be so hidden that no one notices until the framing is so rotted the tub falls into the crawl space. Well, maybe not. The likelihood of catching mold before it causes structural damage is less likely than finding rot. We need to be more concerned about rot and structural issues than mold. Mold can be cleaned up but rot must be

replaced and can cause significantly more damage. Short term moisture – mold, long term moisture – rot.

Construction methods and building standards have changed to accommodate the increased interest in conserving energy. Houses built prior to the 1930's generally had no effective insulation in either ceilings or walls. In essence they were naturally ventilated and moisture dried out quickly. Roofs were usually steeply pitched and constructed with shingles that had gaps between them which ventilated attics and cooled the roof deck. These homes were, of course, heat wasters. Heat escaped into the attics and natural ventilation kept the attic air moving. Homes today don't dry out as quickly because we insulate better and build tighter. Besides that homes today are built with more moisture-sensitive materials. Paper, like that which is found on drywall is nature's most perfect mold food. Mold likes processed wood more than it likes lumber. Just a little moisture in processed wood like OSB and particle board can affect its stability.

Mold can even be built into new homes. In this age when time is money, contractors may not wait until the house structure dries out after a rain before sealing in the walls, trapping the moisture in the walls. This may not happen often but it can happen; so even new homes should be inspected. If you walk into a brand new house and it smells musty, there's probably a problem.

Now let's see what the experts say about mold.

Most people have no reaction when exposed to molds. The biggest health problem from exposure to mold is allergy and asthma in susceptible people. However exposure to environmental factors other than mold in damp indoor spaces, notably house dust mites, viruses, tobacco smoke, and cockroaches, along with pesticides, volatile organic compounds and fumes from furnishings or construction materials can cause the same health effects. There are no tests to determine whether the symptoms are caused by the mold or something else.

There are more than 100,000 types of mold. Some molds, like *Stachybotrys*, produce toxic substances called mycotoxins. These molds generally have a higher water requirement than common household molds and tend to thrive only under conditions of chronic and severe water damage. Presently we don't know all that much about the health effects of most mycotoxins on humans. Most of what we know about mycotoxins comes from exposure of farm animals to moldy grain or hay. **We don't have any tests that can determine whether mycotoxins are the cause of someone's illness. We can't easily or reliably measure the level of mycotoxins in air samples to determine exposure**

**levels.** Currently there are only guidelines and no regulations regarding indoor mold. There may never be any regulations on exposure to mold, because even the lowest levels bother people with severe hypersensitivity. Believe it or not, allergic responses can come from exposure to dead as well as to living mold spores. Therefore, killing mold with bleach and or other disinfectants may not prevent allergic responses.

What about black mold? *Stachybotrys* is a mycotoxin producing mold and usually associated with black mold. It's one of several that are very unhealthy but gets all the attention. *Stachybotrys* does not easily grow indoors and requires large amounts of moisture to grow. The known health effects from exposure to *Stachybotrys* are similar to other common molds, but have been inconclusively associated with more severe health effects in some people. Testing for it is expensive; the results are difficult to interpret and often inconclusive.

From a 2004 report by the Institute of Medicine:

There are no existing effective, reliable measurement processes for mold and that such assessment techniques should be developed. The entire process of fungal-spore aerosolization, transport, deposition, re-suspension, and tracking, all of which determine inhalation exposure, is poorly understood, and methods for assessing human exposure to fungal agents are poorly developed. In clinical medical practice, there is no known dose-response relationship between a specific ambient fungal concentration and any human health effects. There is no significant clinical evidence that humans have adverse effects of immunotoxic, neurologic, respiratory or dermal responses after exposure to mold other than allergic reaction and that, in the clinical medical field, there is no known dose response relationship between a specific ambient fungal concentration and any toxic human health effect. **Therefore, there is no valid data available to support sampling since an assessment of risk-relevant exposure cannot be produced.**

The following are statements from the Scientific Community:

- The Texas Medical Association's Council on Scientific Affairs released a report in September 2002 stating that there is no significant evidence connecting "black mold" to human disease.
- The American Academy of Otolaryngology – Head and Neck Surgery has reported that there is no convincing evidence of a causal association between the black mold *Stachybotrys* and human disease.

- The American College of Occupational and Environmental Medicine states that, except for persons with severely impaired immune systems, indoor mold is not a source of fungal infections. Current scientific evidence does not support the proposition that human health has been adversely affected by inhaled mycotoxins in homes, schools or office environments.
- The U.S. Chamber of Commerce reported July 2003 that in “A Scientific View of the Health Effects of Mold,” a team of scientists found that mold can cause reactions for those who are prone to allergies. Infections caused by mold are rare, except for those who are “immune compromised.” The study concludes that “there is no sound scientific evidence that mold causes ‘toxicity’ in doses found in home environments.”
- Dr. Gailen Marshall, Jr., Director, Division of Allergy and Clinical Immunology at the Medical School, University of Texas Health Science Center at Houston, states that some people do develop allergies and experience symptoms of asthma or hay fever when exposed to some mold spores. “There also are a few mold-related diseases that can be serious, but those are rare. So what about the ‘experts’ who claim to diagnose all sorts of mold-related illnesses such as memory loss or learning disabilities? There is no proof to support those claims.”
- The Institute of Medicine of the National Academies, in its report issued in May 2004, failed to find evidence of a causal link with (mold) and a wide variety of other health conditions.
- The National Center for Environmental Health states that at present there is no test that proves an association between *Stachybotrys Chartarum* and particular health symptoms.
- The Environmental Protection Agency states that the standards or threshold limit values for airborne concentrations of mold or mold spores have not been set. Currently, there are no EPA regulations or standards for airborne mold contaminants.
- The American Industrial Hygiene Association states that some molds produce toxic substances called mycotoxins. Airborne mycotoxins have not been shown to cause health problems for occupants in residential or commercial buildings.

- Drs. Chapman, Terr, Jacobs, Charlesworth and Bardana report the conclusion of their recent study in the September 2003 issue of *Annals of Allergy, Asthma & Immunology*: “When mold related symptoms occur, they are likely the result of transient irritation, allergy, or infection. Building-related illness due to mycotoxicosis has never been proved in the medical literature. Prompt remediation of water-damaged material and infrastructure repair should be the primary response to fungal contamination in buildings.”

There are several ways to test for mold. In bulk sampling, samples (like sections of drywall, pieces of carpet or air filters) are collected for analysis to determine if molds are actively growing. In surface sampling, a swab or adhesive tape lifts the samples for analysis. Air sampling uses a suction type pump to sample the air. According to the HUD Healthy Homes Issue “air sampling is more technically challenging and has greater opportunity for error than source sampling. Comparative assessments of the performance of the different samplers have been inconclusive, although certain samplers have been observed to perform better for specific purposes.”

According to the New York City Department of Health, “air sampling for fungi should not be part of a routine assessment. This is because decisions about appropriate remediation strategies can usually be made on the basis of a visual inspection. In addition, air-sampling methods for some fungi are prone to false negative results and therefore cannot be used to definitively rule out contamination. Microscopic identification of the spores/colonies requires considerable expertise. These services are not routinely available from commercial laboratories.”

From another expert, Dr. Yost of the Building Science Corporation, “an increasing number of companies are offering ‘air testing for mold.’ On the surface this seems like a reasonable thing to do. The problem, however, is that the results of most air sampling for mold are meaningless for two reasons. Air sampling for mold was not developed to determine if an environment was safe or has a dangerous level of mold in the air. Air sampling was developed to help identify the location of a hidden reservoir of mold. If the source of mold is already identified, air sampling does not provide additional meaningful information. Furthermore, safe or toxic levels of airborne mold have not been established. An individual air sample for mold provides a ‘snapshot’ of what was in the air during the few minutes of sampling. The results may not be indicative of the amount of mold that is in the air during most of the day. The Center for Disease Control, the US Environmental Protection Agency and the

American Conference of Governmental Industrial Hygienists do not recommend routine air testing for mold.” “The Minnesota Department of Health does not recommend testing for mold. Instead, you should simply assume there is a problem whenever you see mold or smell mold odors. Testing should never take the place of visual inspection and it should never use up resources that are needed to correct moisture problems and remove all visible growth. Mold testing is rarely useful for trying to answer questions about health concerns.”

Again according to Dr. Yost, “Don’t test for mold. If you see it or smell it you have it. You don’t need to know what species it is to deal with it. You should deal with all mold exactly the same way. Fix the water problem that caused it. Replace the water damaged materials. Clean up the mold, dust and mold spores. If for some inexplicable reason you decide to test for mold insist that the report contains only the following things: Who did the test and when? Where were the samples taken and how? How were the samples analyzed? What are the results of the analysis? The report should contain absolutely no interpretation. Too much mold in a home is obvious. If you see mold and you smell mold – you have mold – and if you see it and you smell it you probably have too much of it. If a home has mold and the water problem that led to mold is obvious it is pointless to test for mold. Mold testing is expensive. Any money spent on mold testing will not be available for cleaning up the mold and fixing the water problem that led to the mold. Also, the samples can take days or weeks to be analyzed – time that is lost that could better be spent cleaning up the mold and fixing the water problem. No recognized authoritative public agency recommends mold testing to guide the clean-up or to direct correction of the water problem.”

So when is testing advised by the experts? Dr. Yost again: “Biological measurements sometimes provide useful information in finding hidden mold when thorough inspection has not found moisture or mold. The likelihood that airborne samples will provide evidence that inspection does not is very small. Reserve sampling for mystery cases, where things smell moldy or people complain of symptoms that are consistent with mold exposure, but no mold is found upon inspection. If an insurance company or a third party requires ‘testing to verify the presence of mold,’ simply send a piece of moldy material to a qualified lab for verification of the presence of mold.”

Alright, your house has mold or mold-like substances. Now what? Find the cause of the moisture and fix it fast. Begin remediation. Remove damaged material (especially porous materials) that can’t be cleaned or is more expensive to clean than replace. Clean the salvaged material (non-porous).

Dry out the area before closing in a wall or ceiling. New building materials were mentioned earlier. Again, Dr Yost says, “Materials like lumber, plywood, oriented strand board (OSB), particle board, paper covered gypsum board may or may not be salvageable. The base case test is – has the material lost structural integrity? Mold growing on solid lumber is most likely a surface contamination issue, not a structural issue. It can be cleaned, dried and salvaged. If solid lumber has lost structural integrity, then it has been colonized by wood decay fungi and probably certain bacteria and that portion must be replaced.” Who should do the clean-up? “The Institute of Medicine committee studied numerous historical studies and publications on the prevention and remediation of mold. The most recent of these include remediation procedures that are based on the assumption that mold is toxic and should be remediated in a manner similar to remediation of a building with asbestos. The physician panel proposes that until medical science has evidence of mold toxicity, remediation should be based on non-clinical factors and the focus should be on moisture control and structural repair.” According to the New York City Department of Health, “there are **no** special requirements for the disposal of moldy materials.”

In summary, above all, when there’s a moisture problem, it needs to be fixed – fast. Whether it’s a leak or high humidity, time is of the essence. The source needs to be located and repaired. The affected area needs to be either cleaned or replaced and dried thoroughly.

As far as testing goes, research is very specific. It doesn’t matter what species of mold is present. The only time testing is useful is to find hidden mold or determine if an area has been adequately cleaned or remediated.

The houses we hear about in the big lawsuits had to be extremely wet for a very long time. Why didn’t anyone notice the obvious mold? Were they empty for a long period of time? Didn’t they have an inspection before they moved in?

Who is to blame when mold is found in a house - who do you sue? Nature? Father Time when a fifty year old pipe bursts? The sun because the shingles succumbed?

If the experts say that there is no connection to mold and health issues other than allergies, where did the data come from in these lawsuits to say that there is?

I hope this answers at least some of the questions and misconceptions you have about the mysterious mold issue in homes.

## Mold Resources

<http://www.aiha.org/Content/AccessInfo/consumer/factsaboutmold.htm>

[http://www.3-d-buildingsolutions.com/resources/yost\\_nathan.htm](http://www.3-d-buildingsolutions.com/resources/yost_nathan.htm)

<http://www.cdc.gov/health/mold.html>

<http://www.epa.gov/iaq/schools/tfs/guideh.html#Mold%20Clean%20Up>

[http://www.cmhc-schl.gc.ca/en/co/maho/yohoyohe/momo/momo\\_005.cfm](http://www.cmhc-schl.gc.ca/en/co/maho/yohoyohe/momo/momo_005.cfm)

<http://www.realtor.org/realtororg.nsf/pages/moldfaq>

<http://www.nyc.gov/html/doh/html/epi/moldrpt1.shtml>

<http://www.eagleih.com/mold.html>

<http://www.eagleih.com/realestate.html>

<http://www.ihs.gov/NonMedicalPrograms/IEH/documents/moldguide.pdf>

[http://www.iuoe.org/cm/iaq\\_bpconc.asp?Item=526](http://www.iuoe.org/cm/iaq_bpconc.asp?Item=526)

<http://www.epa.gov/mold/moldresources.html>

<http://www.cdc.gov/mold/faqs.htm>

[http://www.cdc.gov/mold/dampness\\_facts.htm](http://www.cdc.gov/mold/dampness_facts.htm)

<http://www.inspect-ny.com/sickhouse.htm>

<http://phys4.harvard.edu/~wilson/soundscience/mold/light.html>

<http://www.epa.gov/iaq/molds/moldresources.html>

<http://healthlink.mcw.edu/article/1031002357.html>

<http://www.paint.org/pubs/index.cfm>

[http://realtytimes.com/rtpages/20010605\\_mold2.htm](http://realtytimes.com/rtpages/20010605_mold2.htm)

[http://realtytimes.com/rtpages/20020404\\_mold.htm](http://realtytimes.com/rtpages/20020404_mold.htm)

[http://realtytimes.com/rtpages/20020403\\_mold.htm](http://realtytimes.com/rtpages/20020403_mold.htm)