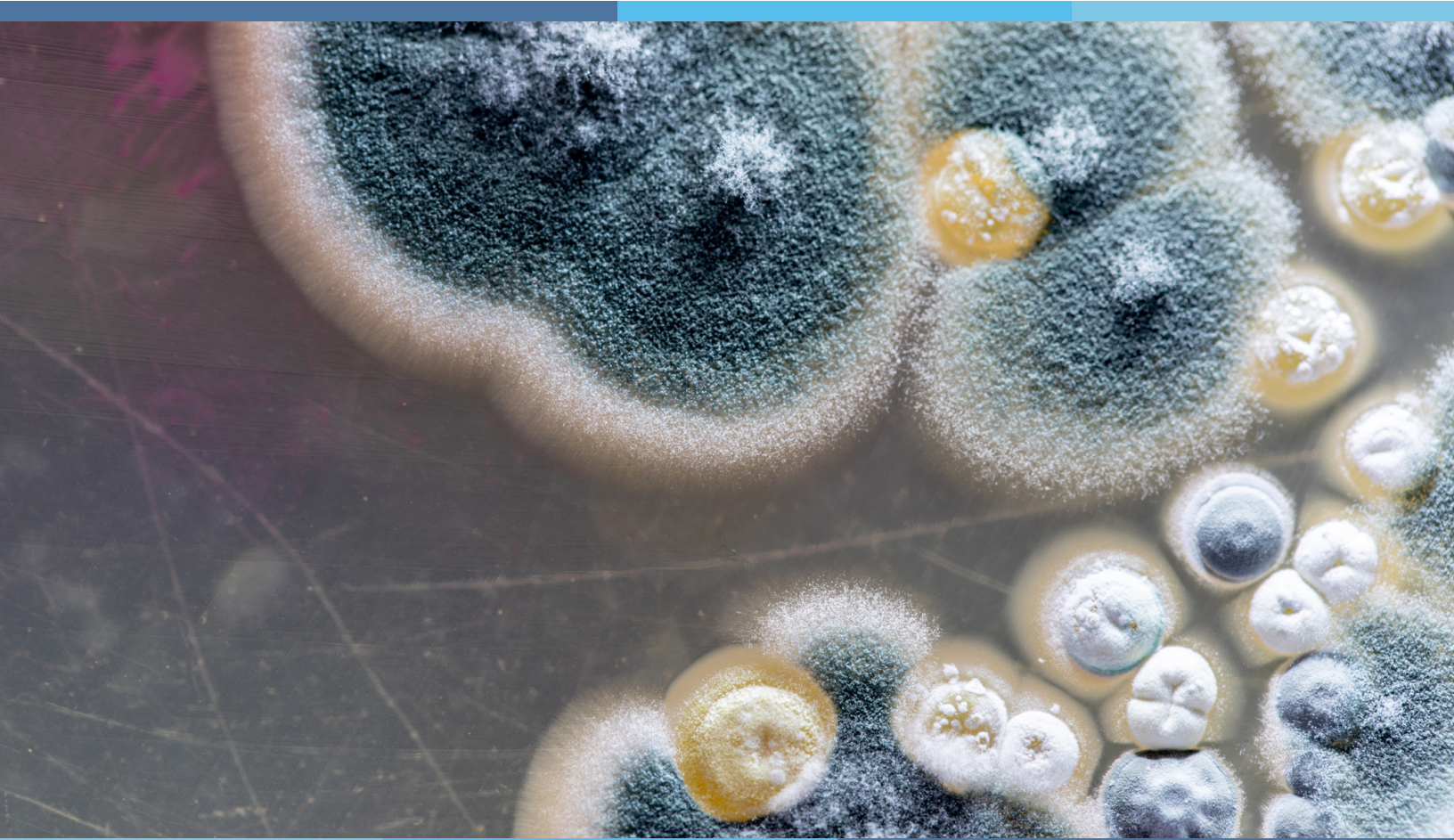


Indoor Air Quality: Health Effects of Airborne Mold & How Mold Is Measured



NAERMC

National Association of Environmentally
Responsible Mold Contractors

Health Effects of Mold

Should I be worried about mold in my home?

Yes and no. On the one hand, there will always be mold in your home in the form of mold spores and pieces/fragments of mold. The presence of mold spores/mold fragments in the air is normal, as is their presence in surface dust. Mold spores and mold fragments are a major component of house dust.

On the other hand, one should not let mold grow and multiply indoors. When this happens your level of exposure can increase, thereby increasing the risk of potential health problems for mold sensitive people.

Building materials, household goods, and furnishings may also be damaged. Mold needs to eat to survive, and it's perfectly happy eating your home if you allow it to.

How can I tell if there is mold in my home?

Indoor mold growth can often be seen or smelled. In most cases, if visible mold growth is present, sampling is not needed.

Small to moderate amounts of mold hidden inside of walls or attics is not a concern from a health perspective. Mold spores and associated allergens, irritants and/or toxins do not penetrate walls or ceilings. The concern is exposure. Breathing mold spores. Only airborne mold that you breath results in exposure.

Generally, you can tell if there are hidden mold problems in your home resulting in exposure if you find that you or your family wake up in the morning with irritated eyes or swollen sinuses but when away from the home are fine. And/or there is a musty smell throughout the home that is not associated with a particular wall or room. The exposure causing the irritation is almost always mold related contamination in your AC, AC closet, and/or ducting. Why? Again, because even moderate to high levels of mold inside of walls or ceilings does not result in significant exposure/irritation since mold does not penetrate sealed walls/ceilings. But even very small amounts of mold growth inside AC, ducting and/or AC closets can result in significant exposure.

What are the common health effects from mold?

There are three commonly recognized symptoms from breathing elevated levels of mold spores that are of potential concern for mold sensitive people: (1) Allergy-like symptoms; (2) Irritant effects; And to a lesser extent (3) Toxic effects.

For people that are sensitive to mold (10-15% of the population), symptoms such as nasal and sinus irritation or congestion, dry hacking cough, wheezing, skin rashes or burning, watery or reddened eyes may occur. People with severe allergies to molds may have more serious reactions, such as hay-fever-like symptoms or shortness of breath.

Molds can also trigger asthma attacks in persons with asthma. Headaches, memory problems, mood swings, nosebleeds, and body aches and pains are sometimes reported in mold complaints, but the causes of these physical symptoms are not well understood.

Very little is known regarding the health risks from breathing in or skin contact with mold toxins.

Allergic disease is considered the most likely health problem related to mold exposures. Research into the health effects related to mold exposure is on-going. But we do know that in almost all cases, once the mold exposure is eliminated/remediated, symptoms quickly go away on their own without Medical treatment, especially in people with otherwise healthy immune systems.

How Mold Is Measured

How is mold measured in Indoor Environments?

A visual inspection, sometimes supplemented by surface and air sampling, can often be an appropriate method to assess indoor environments for mold and mold related illness. But not always.

SURFACE SAMPLING

The presence of mold spores or growth on surfaces can be detected with surface sampling techniques such as tape-lift or swab samples. These techniques can differentiate the presence of mold spores and growth from stains, dirt, soot, plaster efflorescence, and insect frass. Mold spores or growth collected from surfaces are most commonly analyzed directly under a microscope by DME (Direct Microscopic Examination), or less commonly grown on nutrient agar and the resulting mold colonies examined visually without needing DME.

Results from surface samples analyzed by DME are reported differently by different laboratories. DME surface sample results may be reported as spores/cm² or Usual/Unusual or other reporting methods.

Surface sampling cannot be used to estimate airborne spore levels and therefore cannot be used to estimate potential inhalation exposure. Surface sampling methods are not reliably quantitative because sample collection and analytical techniques have not been validated and are not standardized. Surface sample results cannot be assumed to be representative of all areas of the tested environment.

ERMI OR HERTSMI SAMPLING

The US Environmental Protection Agency (US EPA) has experimented with Mold-Specific Quantitative Polymerase Chain Reaction (MSQPCR) for analysis of vacuumed dust samples from homes and has proposed the Environmental Relative Moldiness Index (ERMI) as a means of assessing damp indoor environments for the potential to cause adverse health effects in humans. MSQPCR analysis is considered a “research tool” by the US EPA and it is not intended for public use and has not been validated for use in indoor environments despite decades of research.

The US EPA does not support the use of MSQPCR in a public context.

ERMI involves determining what and how much mold DNA is present specifically in floor dust from commonly cleaned areas. The amount of DNA “spore equivalents” (which is determined by MSQPCR) is not directly related to the number of spores which is the cause of exposure/health effects. Why? Because the floor dust has not only spore DNA but also DNA from mold and mold fragments dragged in or blown in.

ERMI cannot be used to judge whether cleanup is needed or if adverse health outcomes due to mold are likely to occur.

Nevertheless, doctors often prescribe ERMI testing or HERTSMI testing which is a proprietary subset of ERMI that has a proprietary method for collecting surface samples. The “prescription” for ERMI/HERTSMI testing includes proprietary surface sampling procedures defined in such a way as to always result in elevated mold.

Again, studies have shown that such surface testing in no way is a measure of exposure. Yet surface sampling (always comes back elevated) is popular as a scare tactic to drive patients to medical treatment. Testing conclusion by Medical professional: There is mold in the house dust. Therefore, mold is making you sick. Now that we know what is making you sick we can treat you.

But there is always mold and mold spores in house dust because mold/mold spores are one of the main components of house dust. If there is mold in analyzed house dust (always), clean the dust and the mold in the dust will be gone.

AC Ducting and Health

AIR SAMPLING

Mold spores are everywhere in the air. Air sampling methods are used to estimate airborne concentrations and potential inhalation exposure to mold spores. Air sampling is normally done over a short period of time and one sample does not represent the amount of mold spores present over long periods of time. Therefore, comparisons of indoor to outdoor concentrations of airborne mold spores based on a single sample indoors and a single sample outdoors can have limited value in evaluating exposure.

A common method for measuring airborne mold spores is known as Spore Trap sampling. Spore traps measure by Direct Microscopic Examination the total spores both dead (non-viable) as well as viable (capable of germinating/growing). Sample results are reported as spores per cubic meter of air (spores/m³).

There is always some amount of mold spores in the indoor air as a result of mold spores always being present in the outdoor air that enters the home as people enter and exit. As a result there are no Federal or State guidelines or thresholds as to what is Elevated or Not Elevated (Problem Level or Not Problem Level). Problem Level or Not Problem Level of indoor spore concentrations is quite often more of a function of sensitivity of the occupant rather than the actual spore levels.

MOLD FRAGMENTS COMING FROM THE AC AND/OR DUCTING

Mold fragments that result from the high rate of airflow over mold growth in the AC and/or ducting are invisible to both air sampling and surface sampling.

In the event that there is no visible mold in the home or active leaks and occupants feel irritated in the home but not outside, in most cases the likely problem is mold fragments coming from the AC/ducting. These fragments are again invisible to standard testing. And they are highly irritating to sensitive individuals.

The best and most reliable "testing" to determine if there are problem indoor mold levels is by questioning occupants. Does anyone wake up irritated (red eyes) or with swollen sinuses in the morning? But have no such problems outside or in other buildings? If the home is otherwise in good shape (no visible mold and no active leaks, no old/dirty carpet, no heavy clutter) then by the process of elimination the irritation is the result of breathing mold fragments being released from contaminated AC and/or ducting .

Duct cleaners in most states (including Florida) are not licensed and it may seem strange but are not actually permitted to clean ducting because this requires a licensed AC contractor to be part of the team and that rarely happens. Duct cleaners clean grills, spray deodorizers, but they do not thoroughly clean the interiors of the ducting. They do not provide any type of Warranty or Guarantee that ducts will be clean after their service... after you pay for duct cleaning. Or if irritation will be eliminated.

Certain specialty mold remediation contractors clean ducting to as new and will provide an irritation-free warranty when complete.

If irritation in a home occurs with no apparent source of mold, it is almost always the result of microbial contaminated AC and/or ducting. We then recommend having your ducting replaced or duct lining refurbished to as new. Make sure you get a cleanliness and irritation-free guarantee.

In almost all cases, once the mold exposure is eliminated/remediated (duct lining restored to "as new" clean or ducting replaced) mold-related symptoms quickly go away on their own without Medical treatment for otherwise healthy individuals.

Conclusions

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Environmental mold measurements of all types have not been shown to reliably predict the presence of or potential for human health effects in indoor environments. Instead, the extent of mold contamination is best accessed by visual inspection. However, often the problem contamination is hidden in the AC and/or ducting.

Even a small amount of contamination in the AC/ducting will result in significant exposure (breathing airborne mold or mold fragments). It may cost more to have a thorough intrusive visual inspection done inside the AC/ducting than to restore the ducting to as new clean.

If irritated when at home, but not outside of the home, and there are no obvious mold growth problems or active leaks or old/dirty carpet, by the process of elimination the irritation is from contaminated AC/ducting or problems with the AC closet. Why? Because even moderate to high levels of mold inside of walls or ceilings does not result in significant exposure/irritation since mold does not penetrate walls/ceilings. But even very small amounts of mold growth inside AC, ducting and/or AC closets can result in significant exposure.

Your AC contractor will always try to sell you a new AC and/or UV lights. But a new AC or UV lights will almost never fix the irritation problem in the home. Best bet is to have your ducting replaced or duct lining refurbished to as new. Make sure you get a cleanliness and irritation free guarantee from your chosen contractor. Again, duct cleaning is a non-licensed activity in most states (including Florida.)

Make 100% sure that no biocides/ antimicrobials or de-odorizers are sprayed/fogged inside the ducting. Go Green, Chemical-Free.

Why is duct cleaning almost never recommended by mold contractors when occupants complain about indoor irritation or musty odor throughout the home? In some state such as Florida it is illegal for a mold contractor to subcontract AC/Ducting related work to a licensed AC contractor unless the mold contractor is also a General Contractor which is very rare. So finding a problem with ducting does not pay the bills.

Most often mold contractors will conclude that the health related problems are due to mold inside of walls or above ceilings. Why? Because that is where the money is. And tearing out walls / ceilings is often covered by insurance, whereas duct cleaning / refurbishing / replacement is usually not.

