Frequently Asked Questions about Mold

How can mold affect me?

Health effects associated with airborne mold exposure are allergic reactions, eye and respiratory irritation, infection and toxicity. About 10% of the population is allergic to one or more types of mold. Many of these people will be affected by outdoor as well as indoor exposures to mold.

**Respiratory mold infection** (growth in the lungs) can occur, but is rare. Occurrence is limited almost exclusively to immune-compromised patients, including those with transplants, chemotherapy, AIDS, neonates, etc. Toxicity is related to the ability of some molds to produce mycotoxins. There is not sufficient evidence to link health effects to indoor exposure to airborne mycotoxins, although ingestion of moldy food with mycotoxins has resulted in illness. Anyone suspecting they are ill from mold exposure should seek treatment and advice from a medical doctor. It should also be noted that other factors can influence indoor air quality such as other organisms, chemicals such as solvents and pesticides, or gases such as carbon monoxide. Such factors may warrant consideration in some cases. If you experience health symptoms you should see a doctor.

When is mold considered toxic?

The term "toxic mold" is misleading. Molds may produce substances called mycotoxins that modify their environment. Some of these substances are useful as antibiotics; but others are potentially harmful, especially if eaten. However, there is little evidence that breathing mycotoxins in mold-contaminated buildings represents a health hazard. The American College of Occupational and Environmental Medicine states, "Current scientific evidence does not support the proposition that human health has been adversely affected by inhaled mycotoxins in the home, school, or office environment." Current guidance of federal and professional organizations is that mold growth should be controlled in an appropriate manner, regardless of the type of mold.

Can mold affect people with asthma?

A person with asthma who is sensitive to molds could have an asthma attack triggered by either indoor or outdoor exposures. With respect to allergy, the American College of Occupational and Environmental Medicine (ACOEM) states, "While indoor molds are well-recognized allergens, outdoor molds are more generally important." All of the indoor air quality testing on the MTSU campus to date has indicated that airborne mold levels indoors are about 30% of the mold levels outdoors. However, a doctor should be consulted if mold exposure may be a concern. For people with asthma, a common health strategy is to avoid exposure by minimizing the amount of dust in the home. Humidity control is also very important. ACOEM supports indoor moisture control and the broad array of indoor respiratory challenges it affects. Moisture control is also strongly supported by the National Academy of Sciences as outlined in its report, Damp Indoor Spaces and Health.

What is a safe level of mold in air?

There is no specific number that defines either safe or unsafe mold exposure. Some experts have proposed airborne mold guidelines, however none of these have been adopted by regulatory agencies. Mold concentrations outdoors vary greatly with respect to time, species, and amount. Exposure to airborne mold outdoors, where levels often exceed thousands of spores per cubic meter, is considered safe for the general public. All of the indoor air quality testing on the MTSU campus to date has indicated that airborne mold levels indoors are about 30% of the mold levels outdoors. Except in buildings with extensive mold growth, the amount of mold found in indoor air is usually much less than what is found outdoors. For people with allergies to mold however, there may be no practical level of exposure, either indoors or outdoors, that would not create discomfort or harm. It is therefore wise to remove and prevent indoor mold growth.
When should I evacuate because of mold?

Evacuation in response to mold should be rare. There is no established level of airborne mold that is accepted as unsafe for the general population. Those cases where evacuation may be warranted include spaces undergoing mold removal activity, and spaces that are occupied by sensitive populations, such as infants, elderly, the immune-suppressed, and those with medically confirmed symptoms related to mold exposure. It is generally recommended that exposure to mold indoors be minimized. However, it must accepted that mold exposure is inevitable in the world in which we live. We are exposed to many of the same mold species indoors as well as outdoors. Ultimately the decision to vacate a space should rest with the individual occupant, parent or guardian and be based on the amount of exposure, individual sensitivity and the advice of a medical doctor.

Does the type of mold determine the clean up plan?

No. The current guidance from federal agencies and professional organizations is that mold growth in indoor environments should be controlled in a proper manner regardless of the type of mold.

How can I tell if remediation (cleaning) has been effective?

The source of moisture responsible for the mold growth must have been corrected. No visible mold or related odors should remain in the work area. There should also be no debris present. For projects where extensive mold growth was identified, work should have been done under containment conditions (a plastic enclosure under negative pressure evident by the inward movement of plastic walls). The work area should have been thoroughly cleaned using wet methods such as wet wiping with a detergent solution and by vacuuming with a HEPA vacuum. Sampling is generally not recommended due to the high variability inherent in mold levels.

How do you test for mold?

While testing can be useful in some cases such as for conducting health-related research or investigating fungal species-specific health effects, deciding what to do about mold should be based primarily on visual assessment, knowledge of the building structure, and the history of water damage in the building. There are many methods of assessing mold exposures; all of them have limitations. Further, mold levels within a structure are highly variable and large sample number is required to obtain meaningful data. Some research suggests that there may be less variability in data for components of microbiological cell walls, than for entire organisms, but questions regarding how well such data correspond to true exposure remain.

How many samples are necessary to find a mold problem?

The proper number and location of air samples is often a matter of debate and depends on the questions to be answered, strength of desired conclusions and on cost. Mold levels vary greatly with season, temperature, humidity and time of day. This variability requires that multiple samples be collected at each location to be sure the observed difference is real and not just due to chance. A report recently released by the National Academy of Sciences addresses the difficulties associated with sampling. "Thus, because only sparse data are available on variation of exposure to biologic agents in the home environment, it is not possible to recommend how many samples should be taken to produce an accurate assessment of the risk-relevant exposure. However, there is a strong suggestion that airborne concentrations are characterized by high variability over time, an indication that one sample per home is unlikely to be sufficient even when acute health effects are being considered, because variations in exposure occur over very short periods." Sampling plans, when used, should be designed by an experienced professional to answer specific questions. The design should be statistically robust and the goals and strength of the plan should be adequately defended prior to proceeding.
Why are outdoor mold counts important?

In most instances, indoor mold levels will closely parallel outdoor levels, both in type and amount. In naturally ventilated buildings such as many homes, air from the outside enters the building whenever the windows or doors are open. Mold is present outdoors and can enter buildings in many ways, such as when windows and doors are open and people are entering and leaving. Depending on the effectiveness of the building air cleaning devices, outdoor fungi can be removed somewhat from the air stream. The extent to which such a reduction occurs depends on the efficiency of the filtration system and how "open" the building is to the outdoors. Outdoor counts will vary greatly and may in turn cause similar variation in indoor levels. Because of this variability, it can be difficult to differentiate true difference between outdoor and indoor samples without taking a large number of samples. Soil and plant materials are major sources of airborne mold. Studies indicate that outdoor fungal levels vary greatly by region, season, weather conditions, and air movement. According to data published by the American Academy of Asthma, Allergy and Immunology (www.aaaai.org) (exit DHFS) outdoor mold counts for major U.S. cities regularly exceed 10,000 spores per cubic meter of air during much of the year.

What is an acceptable level of mold in surface dust?

Surface or bulk material sampling is often used to determine if mold is present on surfaces or materials such as carpeting and textiles. However, this may not always be necessary. Often, HEPA vacuuming or laundering may be sufficient to clean surfaces where mold spores had accumulated. When mold growth occurs on the surface, professional cleaning or replacement may be required. Methods of sampling surfaces include tape samples (or tape-lift samples), swab samples, and vacuum samples. As with air samples, guidelines have been offered to help define "normal" levels of mold particles in surface dust. However, these numbers can be misleading and care must be exercised in the interpretation of sample data. The weight of the sample can also affect the result obtained. In addition to mold per unit weight and mold per unit area, total dust per unit area should also be recorded. Perhaps of greatest importance is evaluation of the microbial flora reported in the sample data. This can provide insight into the moisture conditions of the building. A mycologist should be consulted for assistance with data interpretation.

How can I respond to a mold problem?

The first step is to identify and repair the moisture problem. Mold will not grow unless sufficient moisture is present. Small amounts of mold growing on visible surfaces can usually be easily cleaned by custodians or maintenance personnel. Care must be taken to control dust related to the cleaning and repair efforts. Larger amounts of mold may require more extensive evaluation, repair or replacement, and dust control. Professional assistance may also be necessary.

What are appropriate control methods for mold remediation?

There are a number of options available to clean up a mold condition, depending on the size and type of surfaces affected. Most important is the need to control dust associated with the clean-up activity. Dust should be controlled using damp cleaning methods and by using HEPA vacuuming. HEPA refers to High Efficiency Particulate Air meaning that the vacuum filter is capable of removing particles that are 0.3 um (micron: one millionth of a meter) in diameter at 99.97% efficiency. Typical vacuum filters will not capture spores as efficiently and may further disperse them in air. When the size of the area with visible mold growth is large or when sensitive people (defined above) are nearby, containing the work area in a plastic enclosure is appropriate. The air inside the enclosure should be actively exhausted to the outdoors by placing the enclosed environment under negative pressure with respect to the rest of the room or building. This means if there are any leaks in the enclosure, that air will move from the cleaner areas outside the enclosure into the enclosure, and minimize air movement in the opposite direction.
How should I handle carpet, drywall and other porous materials that got wet?

When porous items such as drywall and carpet get wet, they should be dried within 48 hours or discarded. Porous items or surfaces are those that can soak up water easily. They include drywall, clothing, textiles, upholstered furniture, leather, paper goods, and many types of artwork or decorative items. Many soft materials can be a food source for mold. When these materials soak up water, moisture can be retained for extended periods increasing the potential for mold growth. Foam carpet pads can retain moisture long enough to support mold growth. In addition to flooding, extended periods of high interior humidity can lead to mold growth. This is sometimes indicated by a musty odor. If sewage or gray water is involved, the materials should be discarded. For assistance on structural restoration from water damage, consult a professional.

How can settled spores be removed from porous items?

In environments where the porous materials have not been wet, but there has been extensive visible mold growth on nearby building surfaces, removing settled mold spores is possible using various cleaning methods. HEPA vacuuming is a good method to consider. If the materials show visible mold growth or are subjected to high humidity for extended periods, cleaning is much less effective. Unless the item has high value, disposal is often the most cost-effective solution.

How can I clean mold on hard surfaces?

After the source of moisture has been controlled, visible mold growth on hard (non-porous) can be scrubbed using detergent and water. Some stains may still be seen on the surface after cleaning. Various strengths of bleach solutions have also been recommended for disinfecting, but proper safety precautions should be taken to prevent skin, eye and respiratory damage when bleach is used. There is no evidence that bleach is more effective than detergents in removing mold from non-porous surfaces. The exception to this is when the water damage is related to sewer backups where there is a concern for infectious disease transmission. Following cleaning, the surfaces should be rinsed and thoroughly dried to reduce the potential for more mold. The underlying cause of the mold growth (water or moisture) should be corrected to prevent re-growth.

Do ozone generators work for mold?

Ozone generators are not recommended for mold control.

Who is qualified to do mold work?

Individuals involved in mold assessment and remediation must commit to following standards of care. A number of federal agencies and professional organizations have produced helpful references that help define standards of care for mold practice. There are no national or state recognized mold certifications.