

# Mold Inside Our Homes

## Instructor Directions

### Objectives:

- Learn about mold, what does mold need to grow?
- Is mold a health concern?
- How to tell if there is a mold problem
- How to fix a mold problem
- Steps to protect yourself during clean up

### Materials needed:

- Leader lesson
- Participant handout- Basic Mold Clean-Up

### Sources:

- EPA- Indoor Air Quality
- Flood Survival and Recovery Fact Sheets Kansas Extension
- LSU Ag Center Research and Extension
- Minnesota Health Department
- Purdue Disaster and Emergency Management Resources

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## What Is Mold?

Molds are a category of fungi. They serve as nature's recycler by helping to break down dead materials. Molds produce tiny cells called spores that float through the air, they are just about everywhere. Live spores act like seeds, forming new mold growths (colonies) when they find the right conditions- moisture, nutrients (nearly anything organic) and a suitable place to grow. Of these moisture (in either liquid or gas form) is the key factor for growth and for control.

## Should I Be Concerned About Mold In My Home?

Although mold spores are everywhere, especially in a humid climate, mold colonies should **not** be allowed to grow and multiply indoors. Mold problems can result in damage to materials and health problems. The longer mold is allowed to grow indoors, the greater the risk and the harder it is to remedy. If you find mold in your home, don't delay correcting the problem.

## HEALTH HAZARDS

### Will Mold In My Home Make Us Sick?

Exposure to molds can affect health. People are mainly exposed by breathing spores or other tiny fragments. People can also be exposed through skin contact (for example, touching moldy surfaces) and by eating mold contaminated food.

The types and severity of health effects from mold vary widely and are usually hard to predict. It depends on the sensitivity of the person, the amount and type of exposure, the length of exposure, the types of mold and many other factors. Because it is typically not possible to establish a clear dosage and response threshold or trigger point, there is not enough scientific evidence to prove cause and effect for many of the potential or suspected health risks of indoor mold problems.

The most common health problems caused by indoor mold are allergic reactions. People who are allergic or sensitive to mold commonly report: nasal and sinus congestion, coughing, wheezing/breathing difficulties, sore throat, skin and eye irritation, sinus and upper respiratory infections. Both live and dead mold spores can affect people.

Although there is a wide variation in how different people are affected by indoor mold, long term or high exposure may eventually become unhealthy for anyone. Exposure to mold can trigger asthma attacks, may suppress the immune system or have other effects.

## **Who Is Most At Risk?**

At greater risks of being affected more severely and sooner than others are: children, elderly people, individuals with respiratory conditions or sensitivities such as allergies and asthma, and persons having weakened immune systems (example; people with HIV infections, chemotherapy patients, organ transplant recipients).

If you feel you or your family's health is affected by indoor mold or you have special health concerns that increase your risk, you should visit and tell your doctor or health professional about your symptoms and mold exposures.

## **What Is "Toxic Mold"? Is It Dangerous?**

Some types of mold can produce harmful chemical compounds called *mycotoxins*, in certain conditions, but don't always do so. Molds that are able to produce toxins are common. If a toxin is produced, it may be present in live and dead spores and fragments in the air.

Although potential damaging effects of specific *mycotoxins* are known and varied, identifying a mold that can produce *mycotoxins* does not tell you whether or not you have been or will be exposed to a toxin. Still, all indoor mold growth is potentially harmful and should be removed promptly, no matter what type of mold is present or whether or not it can produce a toxin.

## **What Is Black Mold? Isn't It The Most Dangerous Type?**

"Black mold" is a misleading term since many types are black. It has become a popular label for *Stachybotrys*, a toxigenic mold that has received major media attention for its suspected, yet unproven, connection to serious conditions and infant deaths. This type of mold is not as common as others since it grows only on cellulose (wood, paper, etc) that has stayed very wet for at least a week.

# **MOLD INVESTIGATION**

## **How Do I Tell If I Have A Mold Problem?**

First and foremost, inspect. The most practical way to find a mold problem is by using your eyes to look for mold growth and wetness, and by using your nose to locate a suspicious odor. If you see mold or if there is an earthy or musty smell you should assume a mold problem exists. Other clues are signs of excess moisture or the worsening of allergy-like symptoms. A moisture detector can be a helpful tool.

Look for visible mold growth- it may appear cottony, velvety, granular, or leathery and have varied colors of white, gray, brown, black, yellow, green. Mold often appears as discoloration, staining or fuzzy growth on the surface of building materials or furnishings, or behind vinyl wallpaper.

### **Should I Test For Mold?**

When mold is visible, testing is usually not needed nor even recommended. 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 delay or use up resources that are needed to correct moisture problems and remove the mold.

### **When Is Testing Useful?**

Sometimes, mold growth is hidden and difficult to locate. In such cases, a combination of air (outdoor and indoor air samples) and bulk (material) samples may help determine the extent of contamination and where cleaning is needed. However, mold testing is rarely useful for trying to answer questions about health concerns. Some insurance companies and legal services may suggest sampling as a form of documentation of microbial contamination. Professional mold remediation contractors may test before and after clean-up to provide evidence of the clean-up's effectiveness. These situations should be addressed on a case-by case basis.

## **MOLD REMEDIATION**

### **How Do I Fix a Mold Problem?**

To clean up, and remove indoor mold growth in small quantities, follow these steps as they apply to your home. (Refer to the EPA guidelines: A Brief Guide to Mold, Moisture, and Your Home or Mold Remediation in Schools and Commercial Buildings available online at [www.epa.gov/iaq](http://www.epa.gov/iaq))

- Find the cause of excess moisture and correct it
- Seal off the work area from the rest of the house and ventilate it to the outdoors
- Cover (to prevent spore release), remove and dispose of mold contaminated materials
- Clean surfaces
- Speed drying of wet materials
- Remain on mold alert.

## **Find & Fix the Moisture Problem**

The most important step in solving a mold problem is to identify and correct the moisture source that allowed the growth in the first place.

### ***Common Sources of Moisture Problems Include:***

- Flooding, inadequate maintenance and failure of building materials and systems
- Roof leaks
- Leaks at windows or other wall openings
- Plumbing leaks
- Overflow from tubs, sinks, toilets or drain pans
- Firewood stored indoors
- Humidifier use
- Inadequate venting of kitchen and bath humidity
- Improper venting of combustion appliances
- Failure to vent clothes dryer exhaust outdoors
- Line drying laundry indoors
- House plants- watering them can generate large amounts of moisture
- Condensation, caused by indoor humidity that is too high or surfaces that are too cold
- Duct system leaks
- Oversized air conditioners that don't remove enough humidity
- Water movement through slabs and foundations; poor drainage around house
- Water vapor driven through walls from hot to cool sides
- Dead air spaces- where air doesn't move much

## **Drying the Indoor Environment**

To keep indoor surfaces as dry as possible, try to maintain the home's relative humidity between 30-60 percent. You can buy basic relative humidity monitors at some home supply or electronics stores. Important ways to control high humidity, condensation and other moisture problems in a warm, humid climate include: seal outside air leaks and duct leaks, use properly sized air conditioners and heaters, insulate or warm cold surfaces, avoid vinyl wallpaper, improve drainage to keep rainwater away from the foundation, inspect and fix roof and window flashing flaws, provide airspace between exterior walls and mirrors, pictures or furnishings, reduce moisture sources inside the home, and when needed, use a supplemental dehumidifier.

## **Seal off Work Area and Ventilate to Outdoors**

Disturbing mold colonies can cause a massive release of spores. To reduce the spread of mold spores to the rest of the home, seal off the contaminated area. Cover central air registers and outlets with plastic and seal gaps around doors. Place a fan in a window of the work room to exhaust air to the outdoors.

## **Take Steps to Protect Yourself**

Using protective equipment when handling mold contaminated materials is a wise precaution. The following equipment can help minimize exposure to mold:

- Rubber gloves and eye goggles
- Outer clothing (long sleeves and long pants) that can easily be removed in the work area and laundered or discarded
- Medium-efficiency or high-efficiency filter mask (can be found at safety equipment suppliers, hardware stores, paint stores or some other home centers) at a minimum, use an N-95 or equivalent mask or respirator.

## **Remove & Dispose of Mold-Contaminated Materials**

Items which have absorbed moisture- porous materials and which have mold growing on them need to be removed, bagged and thrown away. Such materials may include gypsum wallboard, insulation, plaster, carpet/ carpet pad, ceiling tiles, processed wood products (other than solid wood- and paper products). Likewise, any porous materials that have contacted sewage should also be bagged and thrown away. Non-porous materials with surface mold growth may be saved if they are cleaned well and kept dry.

## Take Steps to Protect Others

Take steps to minimize the amount of dust generated. Plan to keep all susceptible people (children, seniors, those sensitive to indoor contaminants along with people with compromised immune systems) out of the area to help minimize their potential for exposure. The following actions can help minimize the spread of mold spores:

- Cover mold with plastic to contain spores before removing moldy material
- Enclose all moldy materials in plastic bags or sheets before carrying from the home
- Hang plastic sheeting to separate the work area from the rest of the home
- Remove outer layer of work clothing in the work area and wash separately or bag
- Damp clean the entire work area to pick up settled contaminants in dust

## Clean Surfaces

Surface mold growing on non-porous materials such as hard plastic, concrete, glass, metal and solid wood can usually be cleaned. Cleaning must remove and capture the mold contamination, because dead spores and mold particles still cause health problems if they are left in place

- Thoroughly scrub all contaminated surfaces using a stiff brush, hot water and a non-ammonia soap/detergent or commercial cleaner. Use a non-phosphate cleaner or rinse thoroughly to completely remove any phosphate residue (which can provide food for new growth)
- Collect excess cleaning liquid with a wet/dry vacuum, mop or sponge
- Rinse area with clean water and collect excess rinse water

After cleaning has removed all visible mold and other soiling from contaminated surfaces, you may choose to use a disinfectant to kill any mold missed by cleaning, if you and others are not sensitive to the disinfectant. In the case of sewage contamination, disinfection must be performed. Contact your local health department for appropriate advice.

- On color-fast, non-metal surfaces, you can disinfect with a solution of  $\frac{1}{4}$  to  $\frac{1}{2}$  cup bleach per gallon of water. DO NOT USE BLEACH IN THE AIR CONDITIONING SYSTEM.
- Milder and less corrosive disinfectants include alcohols, disinfecting cleaners and hydrogen peroxide. Follow directions carefully. Never mix bleach products with products that contain ammonia- this combination may produce a possibly fatal gas.

- Collect any run-off of bleach with a wet/dry vacuum, sponge or mop. However, do not rinse or wipe the bleach solution off the area being treated—allow it to dry on the surface.
- Always handle bleach with caution. Never mix bleach with ammonia—toxic chlorine gas may result. Bleach can irritate the eyes, nose, throat, and skin. Provide fresh air. Protect skin and eyes from contact with bleach. Test solution on a small area before treatment, since bleach is very corrosive and may damage some materials.

### **Speed Dry Wet Materials**

Dry any materials that are wet as soon and quickly as possible. Use fans and dehumidifiers, if possible, and move wet items away from walls and off floors. Check with equipment rental companies or restoration firms to see if you can rent fans and dehumidifiers. New mold colonies can form in as little as three days if cleaned materials stay wet. Wood and other materials that may look dry can still be damp enough to support re-growth.

*Remain on Mold Alert!* Continue looking for signs of moisture problems or return of mold growth. Be particularly alert to moisture in areas of past growth. If mold returns, repeat cleaning steps and consider using speed drying equipment and moisture meters to ensure sufficient dryness. Re-growth may signal that the material was not dry enough, should be removed, or that the source of the moisture problem is not corrected.

### **When Can We Rebuild?**

Rebuilding and refurnishing should wait until all affected materials have dried completely. Be patient. It takes time to dry out wet building materials. Be sure to continue dehumidification and watching out for telltale signs that the moisture problem might be recurring.

### **Can Ozone Air Cleaners Remove Indoor Mold?**

Some air cleaners are designed to produce ozone, which is a strong oxidizing agent and a known irritant of the lungs and respiratory system. Studies have shown that ozone, even at high concentrations, is not effective at killing airborne mold or surface mold contamination. Even if mold were killed by ozone, the health threats would not be reduced until mold contaminants are removed through cleaning. Health experts do not recommend the use of ozone to address mold or any other indoor air problems.

## Where Can I Get More Information About Mold and Indoor Air Quality?

<http://www.epa.gov/iag> EPA- Indoor Air Quality Clearinghouse has information on many IAQ issues involving asthma

<http://www.oznet.ksu.edu/library/Flood/> Flood Survival and Recovery Fact Sheets (Kansas State)

<http://www.health.state.mn.us/divs/eh/indoorair/mold/moldtest.pdf> Testing for Mold  
Minnesota Department of Health

<http://www.bt.cdc.gov/disasters/mold/pdf/reenterfloodedhome.pdf> Reentering Your Flooded Home (CDC)

<http://www.ces.purdue.edu/eden/disastertopics/floodstorms/> Disaster and Emergency Management Resources (Purdue Extension)

Purdue Extension Mold Team, each of the 11 areas has an Educator as a member of the mold team. Contact your local Extension Office for more information from a Mold Team member.

### ***References:***

EPA, A Brief Guide to Mold, Moisture, and Your Home (EPA 402-K-02-003)

EPA, Mold Remediation in Schools and Commercial Buildings (EPA 402-K-01-001, March 2001)

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