



## ENVIRONMENTAL HEALTH SERVICES

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# TULSA HEALTH DEPARTMENT

## MOLD INFORMATION GUIDE

In response to numerous concerns and requests for information about the health effects of mold growing in private homes, schools and businesses, the Tulsa City-County Health Department is providing this information to assist and educate the public in addressing mold problems. While mold and mold spores can cause some adverse health effects in certain people, it is not as serious a health problem as it is currently being reported. We all live with some exposure to mold and mold spores all the time. Mold is part of the natural environment. Without mold and other types of fungi, most organic matter (leaves, wood, plant materials, etc.) would not decompose very well. Mold is not a single organism, it is a colony of organisms, composed of different types that are similar in many ways, yet are distinctive in their very own way. Several of these different types (genera) are known to have the potential to cause or aggravate various respiratory diseases (asthma, fungal lung infections, bronchitis, allergies, etc.). In the great scheme of human diseases, however, mold is not a serious cause of human disease. For example, the “flu-bug” (virus) has a greater impact on human health than mold.

People have asked us about testing the mold in their homes, schools, and businesses. While some private firms can do this, the Tulsa City-County Health Department does not provide this service. The question that needs to be asked is “Is this testing really necessary in the first place?” and as a corollary question, “Will the result of the identification have any significant impact on corrective measures taken?”. Since mold is a natural organism occurring everywhere in the environment, you would expect to find a number of types of mold during a test, including some of those that are considered more dangerous forms than others. Identifying the specific types of mold does little to reduce the problem. In addition, knowing the specific types of mold present does not alter corrective measures that may be utilized.

The following information about mold comes from the Centers for Disease Control (CDC), the federal agency concerned with human diseases and the California Department of Health Services.

### Centers for Disease Control and Prevention

#### **Questions and Answers on *Stachybotrys chartarum* and other molds:**

(<http://www.cdc.gov/nceh/asthma/factsheets/molds/default.htm>)

March 9, 2000

**Q. I heard about toxic molds that grow in homes and other buildings. Should I be concerned about a serious health risk to me and my family?**

A. The hazards presented by molds that may contain mycotoxins should be considered the same as other common molds which can grow in your house. There is always a little mold everywhere in the air and on many surfaces. There are very few case reports that toxic molds (those containing certain mycotoxins) inside homes can cause unique or rare, health conditions such as pulmonary hemorrhage or memory loss. These case reports are rare, and a causal link between the presence of the toxic mold and these conditions has not been proven. A common-sense approach should be used for any mold contamination existing inside buildings and homes. The common health concerns from molds include hay-fever like allergic symptoms. Certain individuals with chronic respiratory disease (chronic obstructive pulmonary disorder, asthma) may experience difficulty breathing.

B. Individuals with immune suppression may be at increased risk for infection from molds. If you or your family members have these conditions, a qualified medical clinician should be consulted for diagnosis and treatment. For the most part, one should take routine measures to prevent mold growth in the home.

**Q. How common is mold, including *Stachybotrys chartarum* (also known by its synonym *Stachybotrys atra*) in buildings?**

A. Molds are very common in buildings and homes and will grow anywhere indoors where there is moisture. The most common indoor molds are *Cladosporium*, *Penicillium*, *Aspergillus*, and *Alternaria*. We do not have accurate information about how often *Stachybotrys chartarum* is found in buildings and homes. While it is less common than other mold species it is not rare.

How do molds get in the indoor environment and how do they grow?

A. Molds naturally grow in the indoor environment. Mold spores may also enter your house through open doorways, windows, heating, ventilation, and air conditioning systems. Spores in the air outside also attach themselves to people and animals, making clothing, shoes, bags, and pets convenient vehicles for carrying mold indoors. When mold spore drop on places where there is excessive moisture, such as where leakage may have occurred in roofs, pipes, walls, plant pots, or where there has been flooding, they will grow. Many building materials provide suitable nutrients that encourage mold to grow. Wet cellulose materials, including paper and paper products, cardboard, ceiling tiles, wood, and wood products, are particularly conducive for the growth of some molds. Other materials such as dust, paints, wallpaper, insulation materials, drywall, carpet, fabric, and upholstery, commonly support mold growth.

**Q. What is *Stachybotrys chartarum* (*stachybotrys atra*)?**

A. *Stachybotrys chartarum* (also known as *Stachybotrys atra*) is a greenish-black mold. It can grow on material with a high cellulose and low nitrogen content, such as fiberboard, gypsum board, paper, dust, and lint. It occurs when there is moisture from water damage, excessive humidity, water leaks, condensation, water infiltration, or flooding. Constant moisture is required for its growth. It is not necessary, however, to determine what type of mold you may have. All molds should be treated the same with respect to potential health risks and removal.

**Q. Are there any circumstances where people should vacate a home or other building because of mold?**

A. These decisions have to be made individually. If you believe you are ill because of exposure to mold in a building, you should consult your physician to determine the appropriate action to take.

**Q. Who are the people who are most at risk for health problems associated with exposure to mold?**

A. People with allergies may be more sensitive to molds. People with immune suppression or underlying lung disease are more susceptible to fungal infections.

**Q. How do you know if you have a mold problem?**

A. Large mold infestations can usually be seen or smelled.

**Q. Does *Stachybotrys chartarum* (*Stachybotrys atra*) cause acute idiopathic pulmonary hemorrhage among infants?**

A. To date, a possible association between acute idiopathic pulmonary hemorrhage among infants and *Stachybotrys chartarum* (*Stachybotrys atra*) has not been proved. Further studies are needed to determine what causes acute idiopathic hemorrhage.

**Q. What if my child has acute idiopathic pulmonary hemorrhage?**

A. Parents should ensure that their children get proper medical treatment.

**WHAT ARE POTENTIAL HEALTH EFFECTS OF MOLD IN BUILDINGS AND HOMES?**

A. Mold exposure does not always present a health problem indoors. However some people are sensitive to molds. These people may experience symptoms such as nasal stuffiness, eye irritation, or wheezing when exposed to molds. Some people may have more severe reactions to molds. Severe reactions may occur among workers exposed to large amounts of molds in occupational settings, such as farmers working around moldy hay. Severe reactions may include fever and shortness of breath. People with chronic illnesses, such as obstructive lung disease, may develop mold infections in their lungs.

**Q. How do you get the molds out of buildings, including homes, schools, and places of employment?**

A. In most cases, mold can be removed by a thorough cleaning with bleach and water. If you have an extensive amount of mold and you do not think you can manage the cleanup on you own, you may want to contact a professional who has experience in cleaning mold in buildings and homes.

**Q. What should people do if they determine they have *Stachybotrys chartarum* (*Stachybotrys atra*) in their buildings or homes?**

A. Mold growing in homes and buildings, whether it is *Stachybotrys chartarum* (*Stachybotrys atra*) or other molds, indicates that there is a problem with water or moisture. This is the first problem that needs to be addressed. Mold can be cleaned off surfaces with a weak bleach solution. Mold under carpets typically requires that the carpets be removed. Once mold starts to grow in insulation or wallboard the only way to deal with the problem is by removal and replacement. We do not believe that one needs to take any different precautions with *Stachybotrys chartarum* (*Stachybotrys atra*), than with other molds. In areas where flooding has occurred, prompt cleaning of walls and other flood-damaged items with water mixed with chlorine bleach, diluted 1 part water to 1 part bleach, is necessary to prevent mold growth. Never mix bleach with ammonia. Moldy items should be discarded.

**Q. HOW DO YOU KEEP MOLD OUT OF BUILDINGS AND HOMES?**

A. As part of routine building maintenance, buildings should be inspected for evidence of water damage and visible mold. The conditions causing mold (such as water leaks, condensation, infiltration, or flooding) should be correct to prevent mold from growing.

**Specific Recommendations:**

- Keep humidity level in house below **50%**.
- Use air conditioner or a dehumidifier during humid months.
- Be sure home has adequate ventilation, including exhaust fans in kitchen and bathrooms.
- Use mold inhibitors-which can be added to paints.
- Clean bathroom with mold killing products.
- Do not carpet bathrooms.
- Remove and replace flooded carpets.

**Summary:** In summary, *Stachybotrys chartarum* (*Stachybotrys atra*) and other molds may cause health symptoms that are nonspecific. At present there is no test that proves an association between *Stachybotrys chartarum* (*Stachybotrys atra*) and particular health symptoms. Individuals with persistent symptoms should see their physician. However, if *Stachybotrys chartarum* (*Stachybotrys atra*) or other molds are found in a building, prudent practice recommends that they be removed. Use the simplest and most expedient method that properly and safely removes mold.

**Note:** Many of the callers to the Tulsa City-County Health Department are of the opinion that the Health Department should be able to make the responsible party take remedial action if any mold problems exist. At this point in time, there are **NO FEDERAL, STATE, OR LOCAL ENVIRONMENTAL OR HEALTH REGULATIONS** regarding mold contamination. There are no standards or requirements stating that mold problems must be abated. The presence of mold in a school, office, business, rental property, or private residence does not obligate the owner to take corrective measures. This means that none of these places are required to be entirely free of all mold problems. Since there are no standards or regulations regarding mold problems, neither the Tulsa City-County Health Department, the Department of Environmental Quality, nor the Environmental Protection Agency can arbitrarily tell someone to remediate mold problems.

Mold needs moisture to grow as well as organic matter. Most serious mold problems are caused by: leaking roofs allowing interiors to get wet, flooding, broken water lines, sewage back-ups, and overflows. The main solution to controlling mold growth is removing the source of moisture. The Tulsa City-County Health Department can use the City of Tulsa Housing Codes to make owners correct the problems mentioned. Once the main problem is corrected and any major damage problems are cleared up, the code does not provide for any mold problems that might arise subsequently.

Citizens with questions concerning mold contamination may contact the Tulsa City-County Health Department @ 918-595-4200.

**California Department of Health Services**  
Indoor Air Quality *Info Sheet*

**Mold in My Home: What Do I Do?**  
March 1998

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*This fact sheet provides information to people who have experienced water damage to their home and presents the health concerns related to mold exposure. It also provides general guidelines on mold detection, cleanup & removal of mold contaminated materials.*

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**ABOUT MOLD**

**What is it?** Molds are simple, microscopic organisms, found virtually everywhere, indoors and outdoors. Molds can be found on plants, foods, dry leaves, and other organic material. Molds are needed for breaking down dead material. Mold spores are very tiny and lightweight, and this allows them to travel through the air. Mold growths can often be seen in the form of discoloration, ranging from white to orange and from green to brown and black. When molds are present in large quantities, they can cause allergic symptoms similar to those caused by plant pollen.

**Should I be concerned about mold in my home?** Yes, if the contamination is extensive. When airborne mold spores are present in large numbers, they can cause allergic reactions, asthma episodes, infections, and other respiratory problems for people. Exposure to high spore levels can cause the development of an allergy to the mold. Mold can also cause structural damage to your home. Similarly, when wood goes through a period of wetting, then drying, it can eventually warp and cause walls to crack or become structurally weak.

**What does mold need to grow?** For mold to grow, it needs:

- food sources - such as leaves, wood, paper, or dirt
- a source of moisture
- a place to grow

**Can mold become a problem in my home?** Yes, if there is moisture available to allow mold to thrive and multiply. The following are sources of indoor moisture that may cause problems:

- flooding
- backed-up sewers
- leaky roofs
- humidifiers
- mud or ice dams
- damp basement or crawl spaces
- constant plumbing leaks
- house plants -- watering can generate large amounts of moisture
- steam from cooking
- shower/bath steam and leaks
- wet clothes on indoor drying lines
- clothes dryers vented indoors
- combustion appliances (e.g. stoves) not exhausted to the outdoors

**CAUTION:** If you see moisture condensation on the windows or walls, it is also possible that you have a combustion problem in your home. It is important to have sufficient fresh air available for fuel burning appliances, such as the furnace, water heater, stove/range, clothes dryer, as well as a fireplace. A shortage of air for these appliances can result in *back drafting* of dangerous gases such as **carbon monoxide** into the home. To prevent back drafting of air, you need either open vents or a ventilation system that brings fresh air into the home to replace air that is exhausted out. *Have your local utility company or a professional heating contractor inspect your fuel-burning appliances annually.*

#### **HEALTH EFFECTS**

**How am I exposed to indoor molds?** Mold is found everywhere, indoors and outdoors. It is common to find mold spores in the air of homes and growing on damp surfaces. Much of the mold found indoors comes from outdoor sources. Therefore, everyone is exposed to some mold on a daily basis without evident harm. Mold spores primarily cause health problems when they enter the air and are inhaled in large number. People can also be exposed to mold through skin contact and eating.

**How much mold can make me sick?** It depends. For some people, a relatively small number of mold spores can cause health problems. For other people, it may take many more. The basic rule is, if you can see or smell it, take steps to eliminate the excess moisture, and to cleanup and remove the mold.

**Who is at greater risk when exposed to mold?** Exposure to mold is not healthy for anyone inside buildings. It is important to quickly identify and correct any moisture sources before health problems develop. The following individuals appear to be at higher risk for adverse health effects of molds:

- Infants and children
- elderly
- immune compromised patients (people with HIV infection, cancer chemotherapy, liver disease, etc.)
- pregnant women
- individuals with existing respiratory conditions, such as allergies, multiple chemical sensitivity, and asthma.

**People with these special concerns should consult a physician if they are having health problems.**

**What symptoms are common?** Allergic reactions may be the most common health problem of mold exposure.

Typical symptoms reported (alone or in combination) include:

- respiratory problems, such as wheezing, and difficulty in breathing
- nasal and sinus congestion
- eyes-burning, watery, reddened, blurry vision, light sensitivity
- dry, hacking cough
- sore throat
- nose and throat irritation
- shortness of breath
- skin irritation
- central nervous system problems (constant headaches, memory problems, and mood changes)
- aches and pains
- possible fever

**Are some molds more hazardous than others?** Allergic persons vary in their sensitivities to mold, both as to amount and type needed to cause reactions. In addition, certain types of molds can produce toxins, called *mycotoxins*, that the mold uses to inhibit or prevent the growth of other organisms. Mycotoxins are found in both living and dead mold spores. **Materials permeated with mold need to be removed, even after they are disinfected with cleaning solutions.** Allergic and toxic effects can remain in dead spores. Exposure to mycotoxins may present a greater hazard than that of allergenic or irritative molds. Mycotoxins have been found in homes, agricultural settings, food, and office buildings.

#### **DETECTION OF MOLD**

**How can I tell if I have mold in my house?** If you can see mold, or if there is an earthy or musty odor, you can assume you have a mold problem. Allergic individuals may experience the symptoms listed above. Look for previous water damage. Visible mold growth is found underneath materials where water has damaged surfaces, or behind walls. Look for discoloration and leaching from plaster.

**Should I test my home for mold? The California Department of Health Services does not recommend testing as the first step to determine if you have a mold problem.** Reliable sampling for mold can be expensive, and requires equipment not available to the general public. Residents of individual private homes must pay a contractor to carry out such sampling, as it is not usually done by public health agencies. Mold cleanup is usually considered one of the housekeeping tasks of the private citizen, along with roof and plumbing repairs, sweeping and house cleaning.

Another problem is that there are few available standards for judging what **is** an acceptable quantity of mold. In all locations, there is some outdoor levels of molds. If sampling is carried out, an outdoor air sample needs to be taken at the same time as the sample indoors, to provide a baseline measurement. Since the susceptibility of individuals varies so greatly, sampling is at best a general guide.

**The simplest approach is: if you can see or smell mold, you have a problem.** Once you know the problem exists, follow the procedure given next.

**Unless the source of moisture is removed and the contaminated area is cleaned and disinfected, mold growth is likely to reoccur.**

#### **GENERAL CLEAN-UP PROCEDURES**

- Identify and correct the moisture source
- Clean, disinfect, and dry the moldy area
- Bag and dispose any material that has moldy residues, such as rags, paper, leaves, or debris.

**What can I save? What should I toss?** Substances that are porous and can trap molds, such as paper, rags, wallboard, and rotten wood should be decontaminated and thrown out. Harder materials such as glass, plastic, or metal can be kept after they are cleaned and disinfected.

Ultimately, it is critical to remove the source of moisture first, before beginning remedial action, since mold growth will return shortly if an effected area becomes re-wetted.

**Removal of Moldy Materials** After fixing the moisture source and removing excess moisture, the cleanup can begin:

- Wear gloves when handling moldy materials
- Remove porous materials (examples: ceiling tiles, sheetrock, carpeting, wood products)
- Carpeting can be a difficult problem -- drying does not remove the dead spores. If there is heavy mold, disposal of the carpet should be considered
- Bag and discard the moldy substances
- Allow the area to dry 2 or 3 days
- If flooded, remove all sheetrock to at least 12 inches above the high water mark. Visually inspect the wall interior and remove any other intrusive molds. (This step may have to be carried out by a licensed contractor).

**CAUTION: Spores are easily released when moldy material is dried out.**

#### **Soap Cleanup**

Before disinfecting contaminated areas, clean the areas to remove as much of the mold (and food it is growing on) as possible.

- Wear gloves when doing this cleanup
- Use a non-ammonia soap or detergent, or a commercial cleaner, in hot water, and scrub the entire area affected by the mold
- Use a stiff brush or cleaning pad on block walls or uneven surfaces
- Rinse clean with water. A wet/dry vacuum is handy for this.

## Disinfect Surfaces

- Wear gloves when using disinfectants
- After thorough cleaning and rinsing, disinfect the area with a solution of 10% household bleach (e.g., 1½ cup bleach per gallon of water). Using bleach straight from the bottle will not be more effective
- **Never mix bleach with Ammonia - the fumes are toxic**
- For spraying exterior large areas, a garden hose and nozzle can be used
- When disinfecting a large structure, make sure the entire surface is wetted (floors, joists, and posts)
- Avoid excessive amounts of runoff or standing bleach
- Let disinfecting areas dry naturally overnight -- this extended time is important to kill all the mold.

**CAUTION: Bleach fumes can irritate the eyes, nose, and throat, and damage clothing and shoes. Make sure the working area is ventilated well.**

**Can cleaning up mold be hazardous to my health?** Yes. Exposure to mold can occur during the cleaning stage. Mold counts are typically 10 to 1000 times higher than background levels during the cleaning of mold damaged materials. Take steps to protect your health during cleanup:

- When handling or cleaning moldy materials, consider using a mask or respirator to protect you from breathing airborne spores. Respirators can be purchased from hardware stores; select one for particle removal (sometimes referred to as a N95 or TC-21C particulate respirator). Respirators are not as effective removing bleach fumes, so minimize your exposure when using bleach or other disinfectants.
- Wear protective clothing that is easily cleaned or discarded
- Use rubber gloves
- Try cleaning a small test patch of mold first. If you feel that this adversely affected your health, you should consider paying a licensed contractor or professional to carry out the work
- Ask family members or bystanders to leave areas when being cleaned.
- Work over short time spans and rest in a fresh air location.
- Air your house out well during after the work

**CAUTION: Never use a gasoline engine indoors (e.g. pressure washer, generator) -- you could expose yourself and your family to carbon monoxide.**

**Can Air Duct Systems become Contaminated with Mold?** Yes. Air duct systems can become contaminated with mold. Duct systems can be constructed of bare sheet metal, sheet metal with an exterior fibrous glass insulation, sheet metal with an internal fibrous glass liner, or made entirely of fibrous glass. If your home's air duct system has had water damage, first identify the type of air duct construction that you have. Bare sheet metal systems, or sheet metal with exterior fibrous glass insulation, can be cleaned and disinfected.

If your system has sheet metal with an **internal** fibrous glass liner, or are made entirely of fibrous glass, the ductwork normally will need to be removed and discarded. Ductwork in difficult locations may have to be abandoned. If you have other questions, contact an air duct cleaning professional, or licensed contractor.

**After I've cleaned everything as thoroughly as possible, can I still have mold odors?** Yes. It is possible that odors may persist. Continue to dry out the area and search for any hidden areas of mold. If the area continues to smell musty, you may have to re-clean the area again (follow the cleaning steps given in this sheet). Continue to dry and ventilate the area. Don't replace flooring or begin rebuilding until the area has dried completely.

**How can further damage to my home be prevented?** Check regularly for the following:

- 1) moisture condensation on windows
- 2) wood warping
- 3) drywall tape loosening
- 4) musty odor
- 5) cracking of plasterboard

If you see any of the above, seek out and take steps to eliminate the source of water penetration, as quickly as possible.

**Can Ozone air cleaners help remove indoor mold, or reduce odor or pollution levels?** Some air cleaners are designed to produce ozone. Ozone is a strong oxidizing agent used as a disinfectant in water and sometimes to eliminate odors. However, ozone is a known lung irritant. Symptoms associated with exposure include cough, chest pain, and eye, nose, and throat irritation. Ozone generators have been shown to generate indoor levels above the safe limit. Furthermore, it has been demonstrated that **ozone is not effective in controlling molds and fungi**, even at high concentrations far above safe health levels. Also, ozone may damage materials in the home. For these reasons, **the California Department of Health Services strongly recommends that you do not use an ozone air leaner in any occupied residential space.** Refer to the CDHS IAQ Info Sheet: *Health Hazards of Ozone-generating Air Cleaning Devices* (January 1998).