



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

Mold or Moisture in My Home: What Do I Do?

(formerly *Mold in My Home—What Do I Do?*)

December 2015

This info sheet provides basic information on mold and water damage in the home. It describes molds, why they may grow indoors, health concerns related to exposures, the detection and prevention of indoor mold, and general cleanup procedures. References to additional documents and resources are provided at the end.

KEY RECOMMENDATIONS

- **CDPH has concluded that the presence of *water damage, dampness, visible mold, or mold odor* in schools, workplaces, residences, and other indoor environments is unhealthy.**
- **We recommend against measuring the number or type of indoor microorganisms to determine the level of health hazard or the need for urgent remediation. Rather, we strongly recommend addressing water damage, dampness, visible mold, and mold odor by**
 - **identifying and correcting the *source of water* that may allow microbial growth or contribute to other problems,**
 - **rapidly drying or removing *damp materials*, and**
 - **cleaning or removing *mold and moldy materials*, as rapidly and safely as possible, to protect the health of building occupants, especially children.**

Based on the CDPH Statement on Building Dampness, Mold, and Health; see the full statement at http://www.cdph.ca.gov/programs/LAQ/Documents/statement_on_building_dampness_mold_and%20health2011.pdf

ABOUT MOLD AND MOISTURE

What are molds?

Molds are simple, microscopic organisms, present virtually everywhere, indoors and outdoors. Mold growth on surfaces can often be seen as discoloration, frequently white, gray, brown, or black but also green and other colors. Molds, along with mushrooms and yeasts, are fungi and are necessary to break down dead plant and animal material and to recycle nutrients in the environment.

How are molds and moisture related?

For molds to grow and reproduce, they need only a food source—any organic matter, such as leaves, wood, or paper, even dust—and moisture. Because organic matter is almost always available, the presence of moisture usually determines if molds can grow.

How am I exposed to indoor molds?

Molds release tiny spores that travel through the air or are carried indoors on shoes and clothing as well as with fruits, vegetable, and firewood. Everyone contacts or inhales some mold every day without apparent harm. It is common to find mold spores in air and dust inside homes. In fact, most of the mold found indoors comes from outdoor sources. However, when moisture occurs in buildings, such as homes, offices, or schools, indoor mold can increase.

Should I be concerned about mold in my home?

Yes. Seeing mold, water damage, or persistently wet materials, or smelling mold, are clearly associated with a variety of health effects. ~~Persons exposed to mold can become sensitized and develop allergies to molds, and~~ other non-allergic health effects also may occur (see “Health Effects” below).

Mold growth also can damage your furnishings, such as carpets, chairs and sofas, and cabinets. Clothes and shoes in damp closets can decay and start to fall apart. Unchecked, mold growth can seriously damage the structural elements in your home, for example, floors, walls, and ceilings.

Can mold become a problem in my home?

Yes. Molds may grow and multiply whenever sufficient moisture is available. Be on the lookout for common sources and signs of moisture inside and outside your home that may lead to mold problems:

- Leaky roof
- Yard sprinkler spray hitting the house
- Plumbing leaks or overflow from sinks or sewers
- Condensation on windows or walls.
- Humidifiers or steam from showers or cooking
- Wet clothes hung indoors or a clothes dryer that exhausts indoors
- Damp basement or crawl space
- Warped floors and stains on walls and ceilings, or other water-damaged materials
- Damp or moist materials,

Note, condensation is often caused by humidity from cooking or washing, but it can also indicate an indoor combustion problem, another potential health hazard. It is important to inspect fuel-burning appliances annually, and contact your local utility or a professional heating contractor if you have questions. Information on gas appliance safety is available at: <http://www.pge.com/myhome/edusafety/gaselectricsafety/gasappliancesafety/>

HEALTH EFFECTS

What health problems can mold cause?

Molds produce health effects through allergy, inflammation, or, less often, infection. Allergic reactions (often referred to as hay fever) are common following mold exposure, but increasing evidence shows that moisture and mold also are associated with non-allergic effects. Known health risks from mold exposure include: the development of asthma, allergies, and respiratory infections; the triggering of asthma attacks; and increased wheeze, cough, difficulty breathing, and other symptoms. The more extensive, widespread, or severe the water damage, dampness, visible mold, or mold odor, the greater the health risks seem to be.

CDPH has released a statement on building dampness, mold, and health that summarizes the evidence-based health risks from indoor dampness and mold:

http://www.cdph.ca.gov/programs/IAQ/Documents/statement_on_building_dampness_mold_and%20health2011.pdf.

How much mold can make me sick?

It depends. Some people are more sensitive than others to moisture-related exposures or mold, and they will experience asthma attacks or other health problems more easily. For other persons, symptoms may occur only with greater, longer, or more frequent exposures. Nonetheless, indoor moisture and mold growth are undesirable and indicate health risks. Basically, if you can see or smell mold, you should identify and eliminate sources of excess moisture, and you should clean up and remove the mold (see “General Cleanup Procedures” below). At present, measuring mold is not useful for deciding if there is enough mold to make you sick.

Are some molds more hazardous than others?

~~Available evidence does not support the usefulness of identifying specific types of fungi as more hazardous than others. Allergic persons vary in their sensitivities to mold, both as to the amount and the types to which they react.~~

Increasing evidence suggests that dampness and mold also cause health effects in some people who are not allergic to molds. This may be due to compounds with inflammatory or toxic properties produced by some molds. These compounds, if produced, may be present in both living and dead spores as well as materials that were contaminated with mold. At present there is no environmental test to determine whether specific fungi found in buildings are producing toxins, nor can blood or urine tests establish that a person has been exposed to fungal toxins.

Additional fact sheets on mold and health effects are available from the CDPH Environmental Health Investigations Branch webpage http://www.ehib.org/cma/topic.jsp?topic_key=15.

The Centers for Disease Control and Prevention (CDC) also has information on *Stachybotrys chartarum* and other molds at www.cdc.gov/mold/stachy.htm.

Are some persons at greater risk if exposed to mold?

Exposure to indoor mold is not healthy for anyone. Therefore, high moisture conditions should be identified and fixed quickly, before mold grows and health problems develop.

Some persons may have more severe symptoms or become ill more readily than others, such as:

- Individuals with existing respiratory conditions, such as allergies, asthma, or other hypersensitivities
- Persons with weakened immune systems (such as HIV-infected persons or cancer chemotherapy patients)
- Infants, young children, and older persons.

❖ Anyone with a health problem they believe to be due to mold should consult a medical professional.

MOLD / MOISTURE DETECTION

How can I tell if I have mold or moisture in my home?

Seeing moist surfaces, water stains, or water-damaged materials indicates moisture and the possible presence of mold. Evidence of current or past water damage should trigger a thorough inspection for a source of moisture. Mold growth may occur underneath water-damaged surfaces (for example, wallpaper), behind furniture, along or behind baseboards, or inside walls, floors, or ceilings. You may have mold if you see discolored patches or cottony or speckled growth on walls or furniture, or if you smell an earthy or musty odor. You also may suspect mold growth if mold-allergic individuals experience some of the symptoms listed above when in the house.

Should I test my home for mold?

There is consensus among scientists and medical experts that the traditional methods used to measure mold exposure do not reliably predict increased health risks. Therefore, CDPH recommends against measuring types or amounts of indoor microorganisms to determine the level of health hazard or the need for urgent remediation.

If for some clear and specific reason, mold measurements are considered useful, reliable air sampling for mold is expensive and requires expertise and equipment that is not available to the general public. Private home and apartment owners generally will need to hire a contractor, because insurance companies and public agencies seldom provide this service.

- ❖ If you can see or smell mold or water damage, you likely have a mold or moisture problem and should take the steps outlined below to correct it.

GENERAL CLEANUP PROCEDURES

The following information is intended as an overview for homeowners and apartment dwellers. Mold cleanup is generally unsuccessful unless persistent sources of moisture have been corrected *first*.

Judging how large a problem you have

Small mold problems—total area less than 10 square feet—can be handled by the homeowner or apartment maintenance personnel using personal protective equipment (see “Can Cleaning Up Mold be Hazardous to My Health?” below). Large contamination problems—areas greater than 100 square feet—may require an experienced, professional contractor. For in-between cases, the type of containment and personal protection will be a matter of judgment.

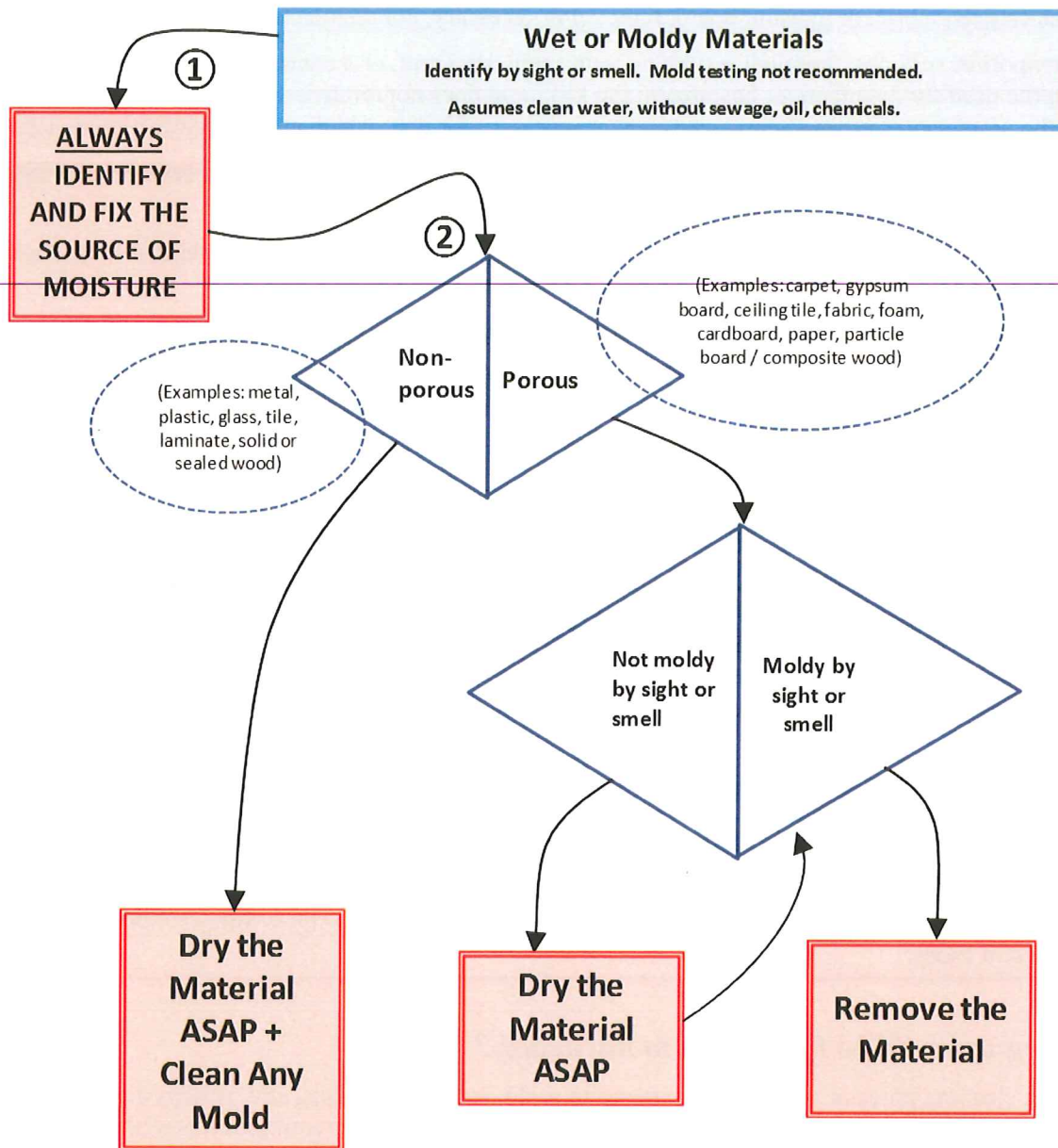
What can I save? What should I toss?

Discard moldy items, such as porous materials, from which it will be difficult to remove mold completely. (Some guidelines suggest that wet porous materials can be cleaned and retained if wet for less than 24–48 hours, but this is inadvisable if visible mold or a moldy smell is already present.) Nonporous materials generally can be kept after they are thoroughly cleaned. (See the Flow Chart on the next page.)

- First, fix the moisture problem and remove excess water.
 - A wet/dry vacuum cleaner may help remove water and clean the area.
- Contain the area in which you work to reduce the spread of dust to other areas, for example, close the door or use plastic sheets to separate the room and run a suction fan that exhausts the air outdoors.
- Discard porous materials, for example, mold-damaged drywall or gypsum board, ceiling tiles, carpeting, drapes, upholstered furniture, and composite wood products. Spores are more easily released into the air when moldy materials dry out, so remove moldy items as soon as possible.
 - Carpet is often difficult to clean thoroughly, especially if the backing or padding is moldy, in which case it should be discarded.
 - If properly bagged or enclosed, mold-contaminated items can be discarded with household trash (unless the material contains asbestos, lead, or the like).
 - If there has been flooding, remove drywall to a level above the high-water mark. Visually inspect the interior, and remove any mold-contaminated material, such as insulation.
- Clean nonporous materials, for example, glass, plastic, metal, and ceramic tiles.
 - Wear gloves, an N-95 respirator, and eye protection.
 - Use a non-ammonia soap or detergent, or a commercial cleaner, in hot water, and scrub the entire mold-affected surface.
 - Use a stiff brush or cleaning pad on cement-block walls and other uneven surfaces.
 - Rinse cleaned items with water and dry thoroughly.

*For further details, consult the more thorough documents listed in the **USEFUL PUBLICATIONS** section below.*

Flow Chart: Recommended Response to Indoor Moisture or Mold



Note:

Some agencies recommend discarding only porous materials wet for more than 24-48 hours, but this is not always correct. Removal of porous materials is needed if mold growth has begun. The time required for mold growth depends on the material, the amount of moisture, and environmental conditions such as temperature. Growth occurs more quickly in warm, moist conditions. A porous material with evident mold, from either prolonged wetting or repeated wetting, should be removed.

However, porous materials like cloth can sometimes be thoroughly cleaned of mold and re-used; other materials like wall-to-wall carpeting or foam cushions are unlikely to be adequately cleanable, and should be removed.

Disinfection of contaminated materials

We do not recommend the use of bleach or similar products for disinfection of mold. For porous materials that are moldy, such as carpets, fabric, or gypsum board, removal is necessary, not disinfection.

For smooth nonporous surfaces, thorough scrubbing with soap, detergent, or a commercial cleaner will remove mold, without the need for disinfection. Disinfecting to kill mold does not remove any allergenic or toxic properties of the mold spores or fragments—removal is necessary for that, which makes disinfection unnecessary.

Disinfection would only be advisable to control waterborne infectious agents, such as from sewage, and this is not involved in most cases of indoor moisture and mold.

Disinfection is thus not usually necessary. We do not recommend the use of bleach for mold, for several reasons. Bleach...

- is unnecessary in areas that can be kept dry; thorough cleaning is sufficient
- is ineffective in killing mold unless materials have already been thoroughly cleaned
- will not disinfect inside a material, such as wood
- has no residual mold-killing effect
- will not remove mold spores—even dead mold may cause health effects
- can be toxic for humans and cause injuries and increased asthma risk.

Therefore, on balance, we do not recommend the use of bleach for disinfection of moldy surfaces, except for unusual circumstances, and then only with stringent precautions (such as wearing gloves and eye protection, and ventilating the area well during and after use). Thorough cleaning is generally preferable for mold removal.

CAUTION

- ❖ *Do NOT use disinfectants instead of, or before, cleaning nonporous materials with soap or detergent.*
- ❖ *Never mix bleach with ammonia or anything other than water (unless product label allows for mixing) because this may produce toxic fumes.*
- ❖ *Bleach fumes can irritate the eyes, nose, and throat, and spilled bleach can irritate skin and damage clothing and shoes.*

Can cleaning up mold be hazardous to my health?

Yes. During the cleaning process, you may be exposed to mold, strong detergents, and perhaps disinfectants. Spore counts may be 10 to 1000 times higher than background levels when mold-contaminated materials are disturbed.

Take steps to protect your and your family's health during cleanup:

- Ask family members and bystanders to leave areas that are being cleaned.
- Use a respirator when handling or cleaning moldy materials to protect yourself from inhaling airborne spores.
 - You can purchase respirators from hardware stores. Select an N-95 respirator that is effective for particle (particulate) removal.
- If you are susceptible to mold, have a history of mold-related health effects, or are not medically fitted for a respirator, consider having another person or a professional do the work.

- Wear protective clothing that is easily cleaned or discarded.
 - Use rubber gloves. Consider eye protection as well.
- Clean a test area first.
- Work for short time periods and rest where you can breathe fresh air.
- If weather permits, air out your home well during and after the work.

- ❖ *Beware that respirators that remove particles will not protect you from fumes, such as from bleach. When using bleach or other disinfectants, minimize exposure by ventilating the area well.*
- ❖ *Never use a gasoline engine indoors (e.g., a water pump, pressure washer, or generator) as you could expose yourself and your family to toxic carbon monoxide.*

Who can I hire to do this work?

If cleaning a test area bothered you or you have health concerns, consider hiring a licensed contractor or other experienced professional to carry out the work. The California Department of Consumer Affairs (CDCA) provides information on how to hire a contractor and describes the different classifications of licensed contractors:

What Kind of Contractor Do You Need?

http://www.cslb.ca.gov/Consumers/Hire_A_Contractor/What_Kind_Of_Contractor.aspx

Licensing Classifications. http://www.cslb.ca.gov/About_Us/Library/Licensing_Classifications/

Finding the Right Licensed Contractor.

http://www.cslb.ca.gov/Consumers/Hire_A_Contractor/Finding_The_Right_Contractor.aspx

Can air cleaners help remove indoor mold or reduce odors?

A particle-removing air cleaner should only be used as a short-term means to reduce mold exposure, and odor-removing air cleaners will not reduce mold exposures. The underlying moisture problem must be identified, and moldy materials must be removed or cleaned.

Ozone-generating air cleaners, in particular, are not effective in controlling indoor molds and other microbial contamination, even at concentrations far above levels safe for humans. Ozone is a strong oxidizing agent and a known lung irritant, and it can permanently damage one's lungs. Ozone also may damage materials in the home, for example, rubber and plastic items may become brittle.

- ❖ For these reasons, CDPH strongly recommends that you NOT use an ozone-producing air cleaner in any occupied space.
- ❖ For more information, refer to the California Air Resources Board, *Hazardous Ozone-Generating 'Air Purifiers'* <http://www.arb.ca.gov/research/indoor/ozone.htm>.

How can I prevent indoor mold problems in my home?

Inspect your home regularly for the signs and sources of indoor moisture and mold listed on page one. Take steps to eliminate water sources as quickly as possible. Act immediately if a leak or flooding occurs.

- Ventilate whenever moisture is being produced; for example, by venting clothes driers to the outside, using an exhaust fan or open window when showering or bathing, and using an exhaust fan vented to the outside or an open window when cooking.
 - Stop any source of water leak or flooding.
 - Remove excess water with mops or a wet vacuum.
 - Move wet items to a dry, well-ventilated area or place them outdoors to speed drying.
 - Move rugs and pull up wet carpet as soon as possible.
 - Open closet and cabinet doors and move furniture away from walls to increase circulation.
 - Open wall cavities, remove baseboards, or pry open wall paneling, if necessary, to allow the area to dry thoroughly.
 - Run portable fans to increase air circulation.
 - Run dehumidifiers to remove moisture from the air.
 - Depending on the time of year, determine if a window air conditioner or portable heater would help dry the area.
- ❖ Do NOT use the home's central blower if it or any of the ducts were flooded because this could spread mold throughout the home.
 - ❖ Do NOT use fans if mold has already started to grow as this also could spread it.

LOCAL ASSISTANCE

Your city or county health department may be able to answer questions or provide assistance on handling mold problems. For links to local California health departments, see:

<http://www.cdph.ca.gov/programs/immunize/Pages/CaliforniaLocalHealthDepartments.aspx>.

If you rent your home, the California Housing Code (enforceable by county or city health inspectors) considers homes with dampness in habitable rooms or ineffective waterproofing, to an extent that endangers the health of occupants, to be substandard (but does not mention mold). However, as of January 1, 2016, mold will be considered a substandard housing condition in Health and Safety Code 17920.3, and local enforcement agencies will have clear authority to address mold complaints. See <http://www.cahealthyhousing.org/>.

The California Department of Consumer Affairs offers *A Guide to Residential Tenants' and Landlords' Rights and Responsibilities*: www.dca.ca.gov/publications/landlordbook/.

PROGRAM INFORMATION

CDPH Indoor Air Quality Program

Contact: staff.caliaq@gmail.com
850 Marina Bay Parkway (EHLB)
Richmond, CA 94804-6403.

USEFUL PUBLICATIONS

General Information

U.S. Environmental Protection Agency. *The Key to Mold Control is Moisture Control.*

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

U.S. Centers for Disease Control and Prevention. *Mold Information.* Information on mold and health; an inventory of state indoor air quality programs; advice on assessment, cleanup efforts, and prevention of mold growth, and links to resources. <http://www.cdc.gov/mold/default.htm>

NIOSH. *Preventing Occupational Respiratory Disease from Exposures Caused by Dampness in Office Buildings.* <http://www.cdc.gov/niosh/docs/2013-102/>

CDPH Occupational Health Branch. *Mold in Indoor Workplaces.* An overview with specific resources for workers. <http://www.cdph.ca.gov/programs/IAQ/Documents/moldInMyWorkPlace.pdf>

California Research Bureau. *Indoor Mold: A General Guide to Health Effects, Prevention, and Remediation.* A report to the California legislature. <http://www.library.ca.gov/crb/06/01/06-001.pdf>

New York City Department of Health. *Mold.* <http://www.nyc.gov/html/doh/html/environmental/mold.shtml>

Health Canada. *Residential Indoor Air Quality Guidelines: Moulds (2007).* Information on the physical and chemical properties, Causes of mold growth, Health effects, and the Canadian guideline. <http://www.hc-sc.gc.ca/ewh-semt/pubs/air/mould-moisissure-eng.php>

Mould, Dampness, and Humidity. Information on the effects of mould on health, Mould: Get rid of it, Mould in indoor air, plus other topics. <http://hc-sc.gc.ca/ewh-semt/air/in/poll/mould-moisissure/index-eng.php>

Cleanup Guidance

U.S. Environmental Protection Agency. *Mold Remediation in Schools and Commercial Buildings.* Also applicable to residences. http://www.epa.gov/mold/mold_remediation.html

U.S. Centers for Disease Control and Prevention. *Prevention and Remediation Strategies for the Control and Removal of Fungal Growth.* http://www.cdc.gov/mold/strats_fungal_growth.htm

New York City Department of Health. *Guidelines on Assessment and Remediation of Fungi in Indoor Environments.* <http://www.nyc.gov/html/doh/downloads/pdf/epi/epi-mold-guidelines.pdf>

Federal Emergency Management Agency. *Cleaning Flooded Buildings.* http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/fema_factsheet_cleaning_flooded_bldg.pdf

Initial Restoration for Flooded Buildings.

http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/fema_initialrestorationfloodbldg.pdf

Consultants, Laboratories, and Clinics

CDPH. *Guidance for Hiring IAQ Consultants.*

<http://www.cdph.ca.gov/programs/IAQ/Pages/HiringGuidance.aspx>

American Industrial Hygiene Association. Listing of laboratories accredited in environmental microbiology (although we do not recommend such testing).

http://apps.aiha.org/qms_aiha/public/pages/reports/publicScopeView.aspx?ProgramCode=38&Version=2

Association of Occupational and Environmental Clinics. *Directory of Clinics in California and Other States.*

<http://www.aoec.org/directory.htm>