Practice Prevention

Mold and Indoor Dampness

from the Learning and Developmental Disabilities Initiative
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Mold is everywhere in our environment. If growth gets out of control, especially in an indoor environment, mold can become a health risk. Unfortunately, mold can grow anywhere from wallpaper, carpets, wood, and ceiling tiles to supply ducts, humidifiers, soil and dust. Mold might need very little food or water to survive and grow. The highest growth occurs in places that have been damaged by water leaks or flooding, but growth can also be extensive in buildings when indoor humidity levels are chronically high.

Exposures to mold and indoor dampness impact our health. The consequences might be decreased respiratory function, allergic reactions, flu-like symptoms or other problems. Some molds produce compounds that can be very toxic to humans. Children and some adults are especially vulnerable to exposure to mold, so that each of the problems listed here might be more severe or life-threatening.

The best treatment is prevention. Minimizing the environmental conditions in your home or in schools and other sites that promote mold growth is critical. Equally important is to identify the clues that might suggest mold growth. If mold is found, intervene to remove both the mold and the conditions that resulted in mold. Start with the advice in this article, then go to the suggested sites to learn more.

- Larry B. Silver, MD

What is mold? What is indoor dampness?

Molds are living fungi that are part of the natural environment[1]. There are thousands of different varieties of mold in many different colors. They may appear furry, slimy or powdery[2]. All grow in damp and humid places and can feed on paper, fabric, wallpaper glue, sheetrock, wood, soap scum, leather, dust and other organic surfaces. Molds reproduce by making microscopic spores that spread in air and can lie dormant for long periods until the conditions are right for growth, such as when the humidity and moisture increase[3]. Molds do not need light to grow. Mold is not healthful in either its dormant or growing states.

Indoor dampness is marked by excess moisture on indoor materials and can lead to the growth of not only mold, but other fungi and bacteria. These emit spores, cells, fragments and volatile organic compounds into indoor air. Dampness also causes indoor materials to degrade, releasing further fragments and materials into the air. Inadequate ventilation can create indoor dampness and also keeps pollutants indoors[4].

What are the health impacts of mold and dampness?

Some people are sensitive to molds and develop allergic reactions such as respiratory symptoms – sneezing, runny nose, red eyes[1], cough, wheezing, bronchitis, and asthma[4,5]. Some molds are irritating to the eyes, skin, nose, throat and lungs of both mold-allergic and non-allergic people[1]. Molds can cause asthma attacks in people with asthma who are allergic to mold, and there is evidence that mold and/or indoor dampness can lead to the development of asthma and immunological problems[4]. Molds can cause infections that affect whole body systems in persons with impaired immunity, such as people with AIDS or uncontrolled diabetes[6]. Some studies have shown other symptoms such as persistent fatigue or headache[7].

Some molds produce toxic compounds called mycotoxins. Although more studies are needed to investigate the health effects of mycotoxins, exposure may be associated with adverse health effects including irritation, skin rash, nausea, immune system suppression, acute or chronic liver damage, endocrine effects,

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cancer, acute or chronic central nervous damage[8], neurological damage[9] and kidney failure[10]. Everyone should avoid exposures, and especially children and individuals whose immune systems are suppressed.

There are some microbial volatile organic compounds (mVOCs) produced by molds. These have a strong or unpleasant odor and may cause headaches, nasal irritation and nausea[8]. At high concentrations, these compounds may lead to eye irritation, conjunctivitis (pink eye), skin rashes, stuffy nose, laryngitis and hoarseness, cough, and even chest tightness[4]. More serious reactions may also occur for some individuals.

Exposure to molds in schools can affect the health of children and all building occupants[4]. Currently, there are no federal standards or recommendations for airborne concentrations of mold or mold spores in workplaces[6].

Symptoms of mold-related illnesses can either happen immediately after exposure or be delayed[1]. Irritation from mold exposure usually resolves when the mold exposure is removed[5]. However, the development of asthma that may be caused by mold exposure may not resolve when exposure is removed.

If you believe that mold exposures are making you sick, avoid the moldy or damp indoor environment if possible and consult your health-care provider. If your exposure is coming from a school or commercial building, raise the issue with your local school board or department of health. Visit the Center for School Mold Help at www.schoolmoldhelp.org for more information about requesting remediation.

How are people exposed to mold and indoor dampness ?

Because mold grows in many places, and because spores are easily carried into homes and other buildings, exposure can happen both indoors and outdoors throughout the year[3]. Mold growing on walls, floors, ceilings, fixtures, in dust and in and on furniture can expose us whenever we're in indoor places. Mold can hide above ceilings, in drywall, under carpets and in other damp or humid places in homes, schools, offices and other buildings. We can breathe in mold bits or spores, touch mold and even eat mold in food[2].

Indoor dampness can occur when buildings experience water intrusion (seeping, flooding, leaking, dripping or other intrusions) or trap moisture. Some buildings trap moisture due to inadequate ventilation or being built too tightly.

How can you reduce your risk?

Reducing indoor dampness, removing mold from indoor places and preventing mold from growing are the best ways to reduce exposures and the risk of adverse health effects. To reduce dampness and prevent mold growth indoors, follow these steps:

- Remove or repair sources of excess moisture indoors: ventilate bathrooms, kitchens and clothes dryers, and fix leaky plumbing or roofs[6].
- Use a dehumidifier or air conditioning system to remove excess moisture from humid areas. Ideal humidity levels are below 60%[3].
- Do not carpet bathrooms and basements[3].
- Add mold inhibitors to paints for use in humid areas[3].
- Improve the drainage or slope around the outside of the building to channel water away from the basement and foundation[6].
- With new construction, build a sloped rather than a flat roof.

To prevent mold's regrowth, use soap and water or a bleach solution of no more than one cup of bleach in one gallon of water. Never add ammonia to

anything with bleach, for it can create toxic fumes[3]. Ventilate the area if possible by turning on a fan and/or opening windows or doors. Wear waterproof gloves and eye protection to keep both mold and bleach from contacting your skin and eyes.

Mold removal, rather than cleaning, is necessary for larger areas or for porous surfaces such as sheetrock and ceiling tiles. Many times, visible mold is an indicator of a dampness or leak problem, with much larger amounts of mold behind the walls or above the ceilings. Removal requires special techniques to protect workers and control the spread of mold spores and fragments[11]. See the Resources section of this publication for specific instructions on cleaning and removal of mold. Hiring a reputable, trained professional is best for larger jobs.

More information about remediation in schools and commercial buildings is available from the Center for School Mold Help, www.schoolmoldhelp.org/content/view/99/40/.

Outdoors, sensitive and asthmatic individuals should avoid areas that are likely to have mold, such as compost piles, cut grass, and wooded areas[3].

Keep food and drink, tobacco products and cosmetics away from affected areas to prevent contamination[6].

Additional resources

Centers for Disease Control and Prevention. Mold: Basic Facts
http://www.cdc.gov/mold/faqs.htm

EPA's Mold Remediation in Schools and Commercial Buildings
http://www.epa.gov/mold/mold_remediation.html

New York City Department of Health and Mental Hygiene. Facts about Mold
http://www.nyc.gov/html/doh/html/epi/epimold.shtml

The Center for School Mold Help
http://www.schoolmoldhelp.org/

This and other Practice Prevention columns are written and published by LDDI staff at the Collaborative on Health and the Environment, with an introduction provided by **LDDI Medical Advisor Dr. Larry B. Silver.** Dr. Silver is a child and adolescent psychiatrist and clinical professor of psychiatry at Georgetown University Medical Center. He has published several popular books for parents, educators and clinicians about learning disabilities, attention deficit hyperactivity disorder, health and mental health. Past president of the Learning Disabilities Association of America, he received their Learning Disabilities Association Award. He also received the Berman Lifetime Achievement Award from the American Academy of Child and Adolescent Psychiatry for his contributions to the study and treatment of learning disabilities. More information about Dr. Silver is available on the LDDI website: www.healthandenvironment.org/initiatives/learning/r/prevention.

For more information or for other Practice Prevention columns, visit the Learning and Developmental Disabilities Initiative online at www.disabilityandenvironment.org or call 360-331-7904.

Footnoted resources

1. US Environmental Protection Agency. Reprinted September 2010. A Brief Guide to Mold, Moisture, and Your Home. www.epa.gov/mold/moldbasics.html, viewed November 13, 2010.

2. New York City Department of Health and Mental Hygiene. Facts about Mold. www.nyc.gov/html/doh/html/epi/epimold.shtml, viewed December 12, 2010.

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5. Yang C, Chiu J, Chiu H, Kao W. Damp housing conditions and respiratory symptoms in primary school children. Pediatric Pulmonology; 1998; 24(2):73-7.

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9. Karunasena E, Larrañaga MD, Simoni JS, Douglas DR, Straus DC. Building-associated neurological damage modeled in human cells: a mechanism of neurotoxic effects by exposure to mycotoxins in the indoor environment. Mycopathologia. 2010 Dec; 170(6): 377-390.

10. Sorenson WG. Fungal spores: Hazardous to health? Environmental Health Perspectives Supplements. 1999 Jun; 107(S3): 469-72.

11. New York City Department of Health and Mental Hygiene. Guidelines on Assessment and Remediation of Fungi in Indoor Environments. www.nyc.gov/html/doh/html/epi/moldrpt1.shtml, viewed April 28, 2011.