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Should you be concerned about mold?

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Joining asbestos, lead and PCBs, mold in buildings has captured the public's attention as a potential health hazard requiring special care.

We're all familiar with the costly mechanical and structural damage caused by the presence of water in buildings. In recent years however, building owners, managers and tenants have discovered that water damage (condensation, leakage or entry during new construction) also creates genuine or perceived health hazards to occupants.

Recent attention to the issue of mold in buildings, particularly Stachybotrys, has fueled a new level of concern. In some cases this attention is justified. In other cases, the concern goes beyond the actual risk, resulting in difficult and sensitive risk communication issues.

Are there reasons to be concerned about mold in buildings?

Yes, if excessive exposure might occur. Molds produce spores, very tiny particles which become invisible airborne particulate, similar to asbestos or lead particles. The spores sometimes contain chemicals, designed to kill other competing life forms (remember, it's a jungle out there). These substances, known as mycotoxins, adversely affect human health.

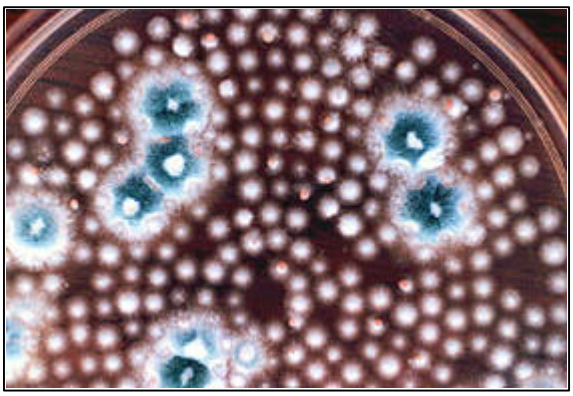
Exposures occur when the spores containing these chemicals are inhaled. Interestingly, it doesn't matter if the spores are dead or alive, since breathing the spores doesn't cause an infection like breathing tuberculosis bacteria or common cold viruses would. The spores' health effects include suppressing the immune system because of the chemical toxins they contain.

While not all molds produce such mycotoxins, all mold spores contain other substances irritating to the human respiratory tract, and can elicit allergic symptoms in sensitive individuals.

Spores from numerous species of outdoor molds are typically found inside buildings at levels ranging from 10 percent to 50 percent of their levels in outdoor

air. The concern for mold in buildings is not related to these species or to the outdoors as a source. Problems occur when uncommon species of molds grow indoors on building materials, especially those containing cellulose.

You may think of sheetrock as a gypsum-and-paper sandwich. I think of sheetrock as a sponge with food pasted to both sides. The gypsum insures a consistent long-term source of moisture for the non-outdoor molds growing on the paper and deposited dust. This provides an ideal environment for molds to reproduce.



Mold looks nice growning in a petri dish . . .
Photo by the Cohen Group

As they proliferate, these non-outdoor molds release spores, creating immediate and possibly future exposures for occupants. Mold growing indoors is unacceptable; remediation requires identifying and removing the porous substrate upon which they are growing, removing the source of moisture and then cleaning up the residual spore-containing dust.

How many spores are too much? This determination requires a situation-specific evaluation, considering many factors including whether or not related health effects are being experienced by occupants. A consensus has emerged among microbiologists, certified industrial hygienists and other qualified health professionals that it is unacceptable to have ongoing mold growth in occupied buildings.

Unlike other contaminants of indoor air, indoor sources of fungal growth can be prevented and eliminated. Conducting site evaluations, sampling and interpreting air monitoring data, and providing guidance on remediation is highly complex and controversial, requiring specialized and experienced certified industrial hygienists.

How mold gets into buildings

From water entry during construction. A tilt-up concrete addition on a concrete slab was assembled without protection from the rain. Six months later, employees began to feel sick and evacuated the building. Investigation revealed extensive mold growth on the plywood underside of the roof, throughout the 2 x 4 studs used to support the interior sheetrock, and on the back side of the sheetrock.

. . . but not so nice growing on a wall.
Photo by Prezant Associates

Employees recalled the sheetrocker working in rubber boots because the concrete slab was wet during construction. Sufficient moisture had been retained within the structure during construction to permit extensive growth of Aspergillis and Penicillium, with elevated airborne levels of both.

Remediation required extensive cleaning and demolition over a 12-month period.

During construction of a large commercial building, numerous packaged fans were rained on prior to the roof being installed. Insulation within these units became wet and moldy. Construction was delayed and ultimately the units had to have the internal insulation removed and replaced.

Flooding. Floods in Western Washington in 1994 resulted in numerous buildings being inundated with water. One flooded building, a one-story convalescent home, was cleaned extensively and reoccupied after receiving 6 to 12 inches of water. Water wicked up the sheetrock and mold grew within the wall cavities until the sheetrock dried. While the mold was no longer alive, it left behind extensive spores which were able to migrate through the wall and create unacceptable exposures to building occupants.

A kitchen located above an office had plumbing which repeatedly leaked water over a one- to two-year period. Mold growth within the office resulted in extensive illness and evacuation of the building.

The masonry exterior of a school building was wet from a misplaced sprinkler during the summer. The following fall, teachers noticed mold bleeding through the sheetrock behind a cabinet. Water had been retained and slowly released for many months by the wet masonry, providing ideal conditions for mold growth.

Remodeling. Disturbance of the exterior of a hospital building during exterior and interior renovation created airborne Aspergillis spores. Because Aspergillis is one of a select few molds which can cause incurable infections in humans, extensive isolation and verification was required to insure that immuno-compromised patients were not exposed.

Condensation. A building in a hot, humid climate was constructed without a vapor barrier on the outside of the building. The air conditioning system was creating a negative pressure indoors relative to outdoors, allowing hot, moist air to migrate inward. The first vapor barrier reached was the vinyl-covered wall on the occupied side of the sheetrock. Because the interior of the building was cold, the humid air leaking inward cooled and released its water content on the back side of

the sheetrock. Peeling the vinyl wall covering off revealed extensive growth of Stachybotrys and other molds throughout the sheetrock.

A building was constructed with ventilation supply ducting in the concrete slab. Unfortunately, the slab was chronically wet. As a result, warm supply air picked up moisture which condensed on the colder exterior surfaces of the building, including windows and interior wall cavities at the cold exterior wall. Extensive mold growth was present in the walls.

In many of the above cases, removal of porous materials such as carpeting and sheetrock, and cleaning of non-porous materials was required. These tasks, along with removal of the water source and HEPA vacuuming of remaining dusts, prevented potential mold spore exposures.

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