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Mold in Schools: a health alert

By Arnold Mann

Last December, USA WEEKEND reported on a Texas family driven from their new home by mold. The story drew an unusually large response from readers, government officials and other media. The federal government requested reprints for flood victims, and CBS' "48 Hours" reported on the same family after our story. This week, we look at the emerging problem of mold in schools.



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It seemed like a harmless enough idea, and a good project for Mrs.

Roueche's environmental science class in Greenville, S.C.: scrape mold samples from the ceiling tiles at Eastside High and send them off to be analyzed.

Roueche knew about molds and how they can make kids sick. Her own children, who attended Buena Vista Elementary just down the road, had been sick for years. First came the nosebleeds, then the headaches, chronic sinus infections and coughing. Nobody suspected the cause might be mold growing in the school building until *The Greenville News* reported that the highly toxic mold *Stachybotrys* had been found at Buena Vista. Angry parents started pulling their kids out of school. By the time it was over, the county had spent \$1.9 million removing mold from the school, with kids herded into temporary classrooms while men in protective clothing suitable for contact with toxic materials cut out every bit of mold-infested ceiling tile, wallboard and timber and hauled it off for burial as toxic waste (the only safe way to get rid of *Stachybotrys*).

The lab results came back on the samples from Eastside High in January 1999: *Stachybotrys*, just like Buena Vista. "We really didn't expect to find what we did," Roueche says.

Now, after months of cleanup, many Eastside students are as sick as -- or sicker than -- the kids at Buena Vista. Three Eastside students have

Telltale signs of mold at home or school

Moist carpeting or stained ceiling tiles, indicating unattended leaks.

Musty odors. These often signal mold growth.

Obvious cosmetic fixes. Replacing ceiling tiles or painting stained wallboards can disguise an underlying moisture problem, such as a leaky roof.

High humidity. Keep a temperature-humidity gauge in the classroom or your living room. Relative humidity should be consistently below 60%.

Heat or air conditioning being shut down for long periods (summer vacation, for example), especially in hot or humid areas.

Cabinets, blackboards or large furniture positioned against outside walls in hot, humid climates. This can impede air flow and drying, and promote condensation between these objects and the cool outside wall.

Lots of plants. Indoor plants are just another source of moisture that can raise humidity and contribute to mold growth.

-- A.M.

been placed on home study by their doctors for health reasons in the past year. David Vass, 15, has had headaches, congestion, ear infections and shortness of breath since he came to Eastside last August. Ashley Reece, 18, says she coughs for weeks and loses her voice. "Just when I'm starting to get it back," she says, "it starts again." Jon Buchanan, 18, has spontaneous nosebleeds. Alicia Moose, 16, has been hospitalized twice for headaches, partly because of mold, and had to be home-schooled for two months last fall. Memory problems also are common. Missy Minock, 18, says she can recall every class and teacher she's had from kindergarten on, "but I can't remember the classes I had last semester."

Mold in schools is on the rise and making children sick. According to a Government Accounting Office report, 20% of the USA's 80,000 public schools have indoor air quality problems. "I'm inundated with schools," says Richard Shaughnessy, program manager of Indoor Air Research at the University of Tulsa and an instructor in the U.S. Environmental Protection Agency's Tools for Schools indoor air quality training program. Shaughnessy travels around the country teaching districts how to keep their schools free of indoor contaminants. (EPA chief Carol Browner says the agency "has been committed to providing school administrators with simple, low-cost methods that improve air quality and have a significant impact on children's health.")

Microbiological contaminants -- particularly molds -- account for half of indoor air health complaints, says Marilyn Black, chief scientist at Atlanta-based Air Quality Sciences, a leading indoor air quality testing firm. That means as many as 7,500 public schools have indoor air problems related to mold. Mold can start growing any time water leaks, Black says, and schools, many of which have flat roofs that collect water, are "notorious" for leaks.

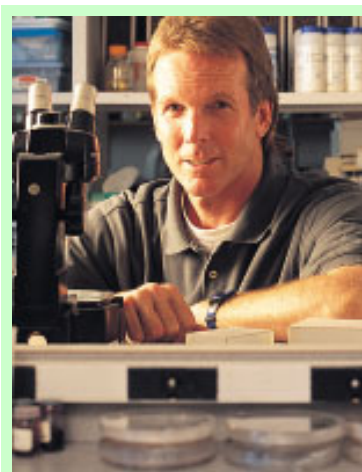
Chronic leaks can turn ceiling tiles, wallboard or wood into ready-to-eat mold food. Common molds like *Cladosporium* and *Penicillium* can grow to toxic levels, triggering allergic reactions, including asthma, as well as sinus infections, headaches, coughing, and eye and throat irritation. Others, like *Stachybotrys*, *Memmoniella* and *Aspergillus versicolor*, produce airborne toxins, called mycotoxins, which can cause even more serious problems, including chronic fatigue, loss of balance and memory, irritability, and difficulty speaking.

Children are more susceptible to mold-related illness than adults, because their lungs and other organs are still developing, says Ruth Etzel, M.D., former chairwoman of the Committee on Environmental Health of the American Academy of Pediatrics. "Pediatricians used to consider molds a nuisance," Etzel says, "but in the last five years we've come to consider them an actual health hazard." Mold-related

respiratory problems often go undiagnosed among kids, she says, because "most pediatricians don't think about molds when they see a child with respiratory problems."

The mere presence of mold, even *Stachybotrys*, does not necessarily mean symptoms of respiratory illness are caused by that mold, cautions Claudia Miller, M.D., an environmental health expert at the University of Texas Health Science Center at San Antonio. Other factors, including volatile organic compounds and a lack of fresh air, can cause similar symptoms. But she says no amount of visible mold is appropriate at school.

When mold is cleaned up, the sick usually get better, but these cleanups are budget breakers. In 1998, California's Sacramento School District borrowed \$5 million to put new roofs on its high schools, where garbage cans had doubled as water collectors. In February, Hill Elementary School in Austin, Texas, evacuated all 777 pupils when large amounts of *Stachybotrys* and *Penicillium* due to roof leaks were found. Several teachers and kids needed medical care. This school year, pupils and staff will remain at an alternate site while Hill is gutted and renovated. El Paso has spent \$4.2 million for mold-related renovations of 14 schools, says Ed Sevcik, former director of facilities for the school district. "We're moving as fast as we can," he says. "I don't think El Paso is any different from any other district facing this problem. The funds just aren't there."



"I'm inundated with schools," says Richard Shaughnessy, a Tulsa air quality expert who travels the country teaching school districts how to avoid contaminants such as mold. He's among the experts participating in Sunday's chat at hgtv.com co-hosted by HGTV and USA WEEKEND.

Beth Roueche's environmental science class had a clear plan. The kids mapped out all visible mold in the building and selected five test sites, then Roueche scraped mold samples from water-stained ceiling tiles into plastic bags and sent them off to Mycological Testing Service, an independent mold-testing company in New Jersey. What came back shocked everyone: Two of the five samples -- from the library and the hallway -- contained *Stachybotrys*. *Penicillium*, *Cladosporium* and *Aspergillus* also were present in some samples.

The school district took its own air samples and assured everyone that the *Stachybotrys* was not airborne and therefore not a threat. Roueche

counters that "Stachy" spores are sticky and rarely show up in air samples. "They said we only found mold in five ceiling tiles, but I explained we only tested five."

Roueche says kids and teachers started getting sicker during cleanup, when workers without protective clothing started tearing out mold-infested ceiling tiles and throwing them on classroom floors, with students present. Oby Lyles, executive communications director for the Greenville County school district, confirms that workers collected and removed hundreds of ceiling tiles but says all the work was done after school hours.

Using the EPA's Indoor Air Quality Tools for Schools Kit, Roueche's class began conducting teacher surveys and monitoring rooms for temperature and humidity. Today, her classroom is full of charts documenting "hot spots."

"I won't sit back and watch this stuff cook me and my kids," teacher Sammie Liberatore said before leaving Eastside for another job. "Something's got to be done. A learning environment is one thing; a dangerous one is quite another."

Roof repairs are "ongoing" at Eastside, says communications director Lyles, with moldy ceiling tiles being replaced as needed. The roof is now being replaced, he says, and the district's custodial staff, servicing nearly 100 schools and 60,000 students, has had mold training. "Once we encountered the problems with Buena Vista," Lyles says, "it raised everyone's awareness about the danger of mold."

Teachers filed no mold-related workman's compensation claims last school year, he says, though there have been health complaints from 27 students in the past two years.

Roueche's health surveys show higher numbers. In January, 160 out of 236 students surveyed said they were having health problems, along with 37 out of 69 teachers, 10 of whom were having nosebleeds.

"It would have been easier and cheaper to tear down the school and build a new one," says state Rep. Bob Leach, of South Carolina's 21st District. He says construction of an entirely new school has been pushed up from 2008 to 2003.

But in the meantime, Roueche wonders, what will become of the Eastside kids -- especially her own daughter, Kimberly, now a sophomore there? Kimberly's old symptoms from Buena Vista came back during her freshman year. "She's had a lot of problems," Roueche says. "She's had chest pains they think are related to her pulmonary system."

One night, not too long ago, student Billy Siverling stood before the county school board and spoke for all the Eastside students. "We have a great student body and faculty," he said. "We love Eastside High. But what price can you put on good health? And how can you raise scores if the very building is making us sick?"

Arnold Mann, a contributing writer for Time magazine, also wrote USA WEEKEND's original cover story on mold.

PHOTO ILLUSTRATION by ALTER IMAGE for USA WEEKEND
PHOTO by REID HORN for USA WEEKEND

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Learn more about mold

USA WEEKEND Magazine and [HGTV.com](#) join forces to bring you an important chat on indoor air quality, and more specifically, the effects of mold in the home. The chat will take place in HGTV.com's chatroom, Sunday, August 20 at 8:00 p.m. ET, and will feature America's leading health experts on this topic.

▶ [Mold chatroom](#)

Environmental Protection Agency

In recent years, comparative risk studies have consistently ranked indoor air pollution among the top five environmental risks to public health. The EPA provides information, guides and tools for your school.

<http://www.epa.gov/iaq>

Healthy Schools Network, Inc.

<http://www.hsnet.org> This is a nationally known activist group out of Albany, NY. This group offers a wide range of information about how to keep schools healthy and will help you communicate with school boards.

CALL the American Lung Association to find out how to spot and treat mold-related respiratory problems: 1-800-LUNG USA (586-4872).

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10 Things you need to know about

mold

by Arnold Mann

1. Where mold grows.

Molds grow everywhere, from the surface of Antarctic rocks to the inside windows of Soviet spacecraft. Molds are a part of nature. We are exposed to them every day. For most people molds only become a problem when they start growing indoors and the air inside a building becomes concentrated with allergenic spores and mycotoxins, the chemical toxins that some molds produce.

2. What happens when molds come indoors.

Airborne mold spores coming from outside are not generally a problem, at least not until they find a damp indoor haven (a roof or plumbing leak, or high indoor humidity) in which to start setting up colonies and reproducing. The resulting high concentration of spores and mycotoxins is recirculated throughout the building by the HVAC system and can be a serious health problem, particularly to sensitive or allergic individuals. The elderly, infants and people who are immune compromised (people on chemotherapy, AIDS patients,etc.) are particularly at risk for mold-related health problems.

Most important is that molds need water to grow. Once a cellulose product like wood, ceiling tile, wallpaper or wallboard becomes wet, it becomes a mold food source. Without water, mold cannot survive.

3. What molds can do to your body

Molds can cause many health problems, including allergic and toxic reactions. Allergic reactions are much more common, occurring predominantly among people with a family history of allergies. Allergic reactions include: asthma attacks, chronic sinusitis and various other respiratory problems. Recent studies have also suggested that certain mycotoxin-producing molds may cause pulmonary hemorrhaging in infants and memory impairment in older children and adults. The mycotoxins appear to have toxic effects on the lungs and nervous system, though doctors are not certain exactly how the damage occurs.

Allergists tests for specific molds are not as useful as those for pollens, stinging insects, mites and pets because many molds cross-react with one another, so it is difficult for doctors to tell which mold is causing the problem. However, finding which mold you are allergic to is not as important, experts say, as getting rid of the mold, which will go a long way in helping solve the problem.

4. How to find out if mold is living in your home or office

There are numerous ways to test for mold, and no single way works all the time. If you can see mold, or if there is an earthy or musty odor, you can assume you have a mold problem. The first step is to identify the moisture source and correct it. This can often be done without bringing in experts.

Mold can grow in vast quantities behind walls, and it may not show up in air sampling, because spores may not be airborne at the time of sampling. Or some samplers cannot detect dead spores, which can also be a health threat. But, if there is mold growth in a building, a knowledgeable investigator using a good lab can usually detect it. (To find experts who can test your home for mold, contact the American Industrial Hygiene Association at www.aiha.org.)

Before hiring a building investigator, ask about their training in indoor air, particularly in mold sampling. Ask whether they use an accredited lab, and check their references. What special training and experience have they acquired for investigating mold in buildings? How will they determine if sampling is appropriate? How many types of samples do they have experience taking? Do they use a laboratory accredited for environmental microbiology?

Test results should say whether there is evidence of mold growth in a building and what kinds of mold have been found rather than providing mold counts, which alone are useless

5. Dead mold is still dangerous

Dead molds are just as undesirable as live molds; they can still make you sick. Removing molds (dead and alive) is more important than killing them.

6. Some molds are more hazardous than others

Molds that produce mycotoxins, such as *Stachybotrys* and *Trichoderma*, present a greater hazard than common allergenic molds like *Cladosporium* and *Alternaria*. Health effects will vary with the specific toxin, the concentration in the air and the age and general health of the patient.

7. You can keep mold out

Mold growth and the illnesses associated with it can be prevented by keeping buildings and the air in them dry -- ideally, indoor relative humidity should be kept below 60 percent. A dehumidifier will keep the humidity in the air low, but if it is not cleaned frequently, it can

become a source of mold contamination itself. Any significant areas of mold growth found inside a building should be removed, not just killed, by trained individuals wearing proper protective clothing and equipment. The larger the area, the more caution is required.

8. Molds are useful organisms.

Together with bacteria, they are responsible for breaking down organic matter. They are among the principal micro-organisms involved in biodeterioration, which gives us compost and many other useful things.

9. Molds make up 25 percent of the biomass of the earth.

10. Molds have been causing humans grief since time began.

The book of Genesis actually gives instructions as to how mold growth indoors should be handled and controlled.

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