



## MOLD - Ubiquitous and Insidious



Dr. Kate Thomsen and Silky

Mold is a member of the fungus kingdom of organisms, along with mushrooms and yeast. We all know mold. It's in our soil and it grows on our plants, our food leftovers, and our shower curtains. Molds grow best in warm, damp and humid conditions. It can appear within 24 hours of water intrusion into a home and the CDC has recommended immediate clean-up of the water to prevent mold growth. What's all the fuss about mold? It has been around forever and we have all been exposed. Why is it the newest health hazard?

Mold can affect the health of plants, animals and humans. The three manifestations of mold in humans are allergy, infection and toxicity. With mold allergy, the immune system is stimulated by mold spores and symptoms like hay fever or asthma occur. Mold can sensitize people such that they experience symptoms every time they are re-exposed to the same mold species. Allergy testing can determine if you are allergic to mold and you can be de-sensitized. More serious allergic reactions can be found in persons with prolonged exposure to high levels of mold like farmers and wood workers. A type of allergic pneumonia can occur in persons with these occupations.

Another way that mold can affect people is through infection. Fungal toenail infections are common as are vaginal yeast infections. Skin rashes are commonly due to fungi. Fungal lung infections are more common in people whose immune systems are compromised such as Aspergillus pneumonia in people with cystic fibrosis and histoplasmosis pneumonia in people with HIV.

Most of us are coexisting with molds and other fungi and making the best of it. We keep the humidity of our homes low, we clean and mop regularly, squeegee the shower stall and we throw out leftovers before we see "fuzz" growing. But we are still breathing, touching and eating mold spores. One can assume this has been

going on for a long time in most people without repercussions, BUT there are short and long term health risks from exposure to mold. Many common molds release mycotoxins – chemicals that literally poison us. Many of these chemicals are the same ones we know to be carcinogenic, immune suppressing, neurotoxic and hormone modulating such as benzene, acetone, styrene, and toluene. There are over 500,000 molds and mycotoxins known and the chemical metabolites produced by molds (mycotoxins) far outnumber those produced by viruses and bacteria. Molds are truly little chemical factories.

The earliest known mycotoxins to cause mass illness was a mycotoxin produced by the fungus, *Claviceps purpurea* or ergot. In the Middle Ages, an "outbreak" of ergotism occurred from eating rye contaminated with this fungus. The mycotoxin produced is an alkaloid chemical that causes constriction of the blood vessels. Blood supply to the limbs was reduced causing burning pain before the limbs turned black and dropped off. Another strain of the *Claviceps purpurea* (ergot) fungus produced a mycotoxin that caused hallucinations, seizures and vomiting. The contaminated rye eaten by people in the early American colonies is now believed to have been the cause of the strange behaviors prompting the Salem Witch trials.

Today we don't see "outbreaks" from an unusually rainy harvesting season and poorly stored grains. But we do see people who are living longer but living with chronic inflammatory health conditions. The medical literature clearly shows the insidious nature of mycotoxin exposure and its association with dysfunctions of almost every organ system and many symptoms. Mycotoxins suppress the immune system allowing for recurrent sinusitis, ear infections, bronchitis and interstitial cystitis. They can have estrogenic effects causing precocious puberty and breast enlargement. Some have neurologic effects causing balance or movement disorders, tremors, dementia, depression and cognitive dysfunction. Some are associated with joint pain, stiffness, numbness and tingling, fatigue, weakness and headache. Several have a well-documented association with cancer (aflatoxin b1 and liver cancer, fumonisins and esophageal cancer...).

The first principle in toxicol-

ogy is to remove yourself from the exposure. In the case of mycotoxins this becomes difficult. If you don't feel well most days then noticing that you feel better when you are away on a vacation can indicate mycotoxin exposure in your home. If you always feel worse at work then there is a good chance you are being exposed there. Mold does not have to be visible for the Volatile Organic Compounds (VOCs) we are calling mycotoxins to be present. They can be emitted from behind walls and closed spaces and from molds too small to see. A reputable mold inspector can come to your house, do a thorough inspection and take samples (air, swab and tape) for molds and wipes for mold chemicals (mycotoxins). The best inspectors know all the secret places to look, take lots of samples and may even use a microscope on site to guide the process. If toxic mold is found (not all mold produces toxins), the environment must be remediated, similarly to in the era of asbestos, because of the long term health risks. Remediation must also be performed by an experienced and reputable service that is independent of the mold inspector. Containment and negative pressure are the keys to successful remediation as recontamination is likely without meticulous attention to detail. Post remediation sampling should be done by the original inspector or a third party independent of the remediation service.

But what if you don't feel better when you are away from your work and your home? Perhaps you have multiple symptoms consistent with mycotoxin exposure and have had living situations where you remember mold being present. There are some biomarkers that can be tested in a blood sample to check immune system status, and clues that make mycotoxins a possibility. There is a new lab that tests the urine (or other samples) for 4 common mycotoxins (aflatoxin, ochratoxin, trichothecenes, gliotoxins). Mycotoxins are fat soluble and stored in the body. Since inhalation is the commonest route of exposure, the possibility exists that the sinuses and lungs are the internal reservoirs for mycotoxin producing molds. Samples taken from these areas can be tested for molds and fungi. A Mayo Clinic article from 1999 suggested the fungal sinusitis was common especially in chronic sinusitis. An Austrian study confirmed the findings and since then, more convincing evidence has mounted. The NIH

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**Some Molds and their Mycotoxins**

**Aspergillus:** Ochratoxin A, Gliotoxin, Aflatoxin, Sterigmatocystin  
**Penicillium:** Ochratoxin, Patulin, tremorgens  
**Stachybotris:** Macrocytic trichothecenes  
**Trichoderma:** Macrocytic trichothecenes  
**Fusarium:** > 20 mycotoxins (mostly food, now also in indoor environments)  
**Chaetomium globosum:** Chaetoglobosin A, C  
 Diet – aflatoxins

**Foods Highest in Mycotoxins**

Alcoholic Beverages	Barley	Peanuts
Corn	Sugar cane	Rye
Wheat	Sugar beets	Cottonseed
	Sorghum	Hard Cheeses



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recently gave the Mayo a 2.5 million dollar grant to study mold in the sinuses. Conventional medicine, always slow on the uptake, won't be offering any tests and treatments anytime soon though.

Treatment of mycotoxin related symptoms is like other detoxification protocols. First there has to be a gentle opening of the channels of elimination: getting the sweat, urine and stool to pass easily and often. One must eliminate other sources of toxic load (synthetic chemicals in personal and home care products, chemicals and additives in non-organic foods, other environmental allergens...). Optimal diversified organic nutrition and adequate sleep are needed. Immune system, gastrointestinal system, and detoxification systems should be supported. Then slowly using biofilm busters, more intense detoxification with glutathione and Phosphatidylcholine, far infrared sauna and binders, the mycotoxins will be nudged out, captured and eliminated. Inadvertent recontamination must be avoided.

Our energy efficient homes now have much fewer air exchanges per hour, the quality of some of our building materials has gone down, and we build houses in the rain. We have indoor/outdoor animals and our clothes and shoes track particulates into our homes from around the world. Climate

change has given us more flooding and water intrusion. Why aren't we all sick with mold/mycotoxin symptoms? It is because of our biochemical individuality: our genetic strengths and weaknesses in immune and detoxification systems, our lifestyle of supportive nutrition and sleep or unhealthy lifestyle, etc.... In Functional Medicine, we take into consideration that health and illness are multifactorial and each person's current status and health trajectory will be unique. AND just because you don't think you are affected by mold now, you may be in the future. Remember, you may not see it and yet it is still producing toxins.

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