KRESSER INSTITUTE
FOR FUNCTIONAL AND EVOLUTIONARY MEDICINE

Environmental Toxins Basic Recommendations - Part Three

Let's move on to indoor air quality. This is a vast category, but we're just going to cover it briefly here, and a future advanced module will go into more detail. People spend up to 22 hours a day, or over 90 percent of their time now in the industrialized world, in confined indoor spaces, and the concentrations of air pollutants may be 2.5-fold higher indoors than outdoors.

Indoor air quality is influenced by a number of factors: type of sources, emission rate from those sources, ventilation rate, absorption of compounds by materials, temperature, and humidity. Improvements in building design and insulation to improve energy efficiency have unfortunately created air-tight buildings that have higher levels of contaminants. Many adverse health effects are associated with poor indoor air quality, particularly respiratory disease, as the main pathway of exposure is inhalation, but also cancer, cardiovascular disease, and generalized inflammation.

According to a report entitled *Implementing Health Protective Features and Practices in Buildings*, issued by the Federal Facilities Council, 43 percent of buildings they examined had current water damage, and 85 percent had past water damage. When water damage occurs, and relative humidity is high enough, mold can grow in as little as 24 to 48 hours. As alarming as these numbers are, they don't tell the whole story. Although water damage is probably the biggest concern, mold and other biotoxins can also develop in buildings that are not water damaged but just have indoor relative humidity levels above 50 to 60 percent. In fact, many experts recommend maintaining indoor humidity levels between 40 and 50 percent for preventing the growth of mold and other biotoxins.

Partial list of toxins in WDB

Fungi
Bacteria (possibly including Borrelia, Babesia, and other organisms transmitted by tick bites)
Actinomycetes (gram-positive bacteria from the order Actinomycetales)
Mycobacteria
Mold
Mold spores
Endotoxins (aka lipopolysaccharides, or LPS; cell wall components of gram-negative bacteria)
Inflammagens (irritants that cause inflammation and edema)
Beta-glucans (diverse group of polysaccharides)
Hemolysins (exotoxins produced by bacteria capable of destroying cells)
Microbial volatile organic compounds (mVOCs; organic compounds released by microorganisms when there is adequate food supply for such "secondary metabolite production")

It's not just mold that is a concern in water-damaged buildings. There are many other toxins as well, and I've included a partial list on this slide. They include fungi, bacteria, actinomycetes, mycobacteria, endotoxins, inflammagens, beta-glucans, hemolysins, and microbial VOCs, or volatile organic compounds.

What we often refer to as mold illness is actually a much more comprehensive and multifaceted syndrome now known as chronic inflammatory response syndrome, or CIRS, for short. CIRS is caused primarily by exposure to toxins in water-damaged buildings, but it can also be caused by toxins produced by certain infectious bacteria such as Borrelia, the bacteria that causes Lyme; parasites such as Babesia that are found in ticks; and toxins that are found in fish and freshwater algae such as pfiesteria and ciguatera. CIRS was originally defined by Dr. Ritchie Shoemaker, a former family physician in Maryland. Dr. Shoemaker is now retired, but he is still actively involved in raising awareness of and advancing the understanding of CIRS.

Nearly everyone will become ill when exposed to sufficient levels of these biotoxins, but most people recover once they're removed from exposure. Their detoxification system is able to recognize the biotoxins in their bodies as toxins and eliminate them via normal mechanisms. However, a minority of people have HLA, or human leukocyte antigen, genes that prevent their bodies from being able to recognize and thus eliminate biotoxins. In these people, the biotoxins will remain in the body and trigger a chronic, systemic, inflammatory response, and these are the people who develop CIRS. According to Dr. Shoemaker's research, roughly 25 percent of the population is genetically prone to develop CIRS if two conditions are met: one, sufficient exposure to biotoxins, either from a water-damaged building, bacteria, freshwater algae or fish; and two, a

priming inflammatory event, which is something that triggers and activates the immune system, such as a serious upper respiratory tract infection or a tick-borne illness such as Lyme disease.

CIRS signs/symptoms

Onset of symptoms after moving into new house or starting job at new location
Fatigue, weakness
Post-exertional malaise
Memory problems, difficulties with concentration and executive function
Disorientation and confusion
Headaches
Vertigo, lightheadedness
Muscle aches, cramping, joint pains without inflammatory arthritis
Hypersensitivity to bright light, blurred vision, burning or red eyes, tearing
Cough, asthma-like illness, shortness of breath, chronic sinus congestion
Air hunger or unusual shortness of breath at rest
Chronic abdominal problems including nausea, cramping, secretory diarrhea
A propensity to experience static shocks

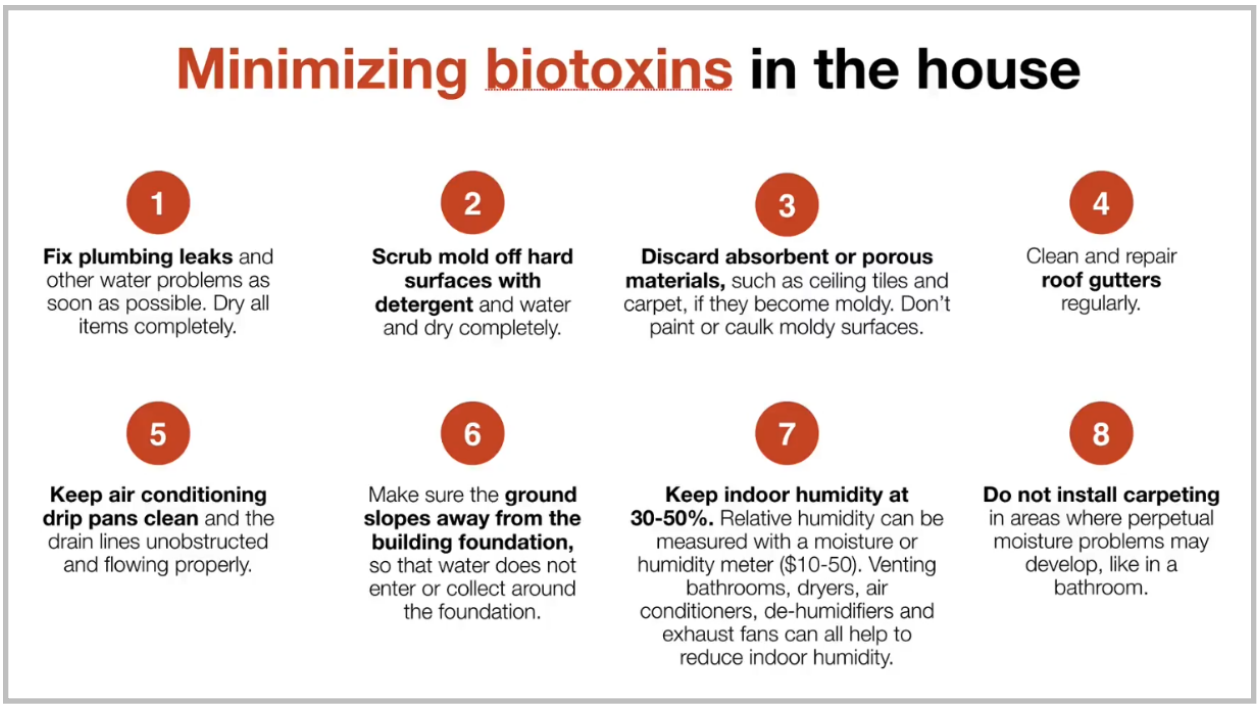
Unfortunately, the vast majority of patients with this condition have not been properly diagnosed or treated because conventional doctors and even many functional and integrative medicine specialists aren't looking for it. The fact that CIRS patients also typically meet the criteria for other syndromes and diseases such as fibromyalgia, ME/CFS, post-treatment Lyme syndrome, and multiple sclerosis compounds the problem. If you have patients you suspect may have CIRS, refer them to a Shoemaker-certified physician if possible. You can find them at survivingmold.com, unless you have expertise in this yourself. Unfortunately, there aren't very many certified Shoemaker physicians yet, but the number is growing at a fairly consistent rate at the time of this recording, so hopefully that will change soon.

There are some things you can do to help these patients in the interim while they are finding further assistance. First, have them get their home and any other environment where they spend significant amounts of time in tested for mold and other biotoxins. Unfortunately, this is easier said than done because many mold inspectors are not using comprehensive, accurate testing methods. If you call up a local mold inspector and ask him or her to come assess your property, chances are they'll do a visual inspection and take some spore trap air samples. Both of these methods can yield useful information, but on their own, they are often not enough. Spore trap air sampling doesn't allow

identification of particular species of Penicillium/Aspergillus and Wallemia, which is important because different species have different health effects. In addition, air sampling devices only collect a small sample of air from directly around the device, about the size of a grapefruit. This matters because mold spores have different molecular weights, and some do not remain airborne for long. For example, Stachybotrys chartarum, which is one of the most well-known species of mold, black mold, is heavy and tends to settle onto the ground rather than remaining airborne.

A better method of initially screening a building for mold is surface or air PCR, polymerase chain reaction. This is a quantitative PCR technique called MSQPCR, and it looks at, in the case of surface sampling, dust that has settled in buildings and sequences the mold species so you can identify the exact species. In the case of air PCR sampling, it does the same thing, but it collects a much larger volume of air over an eight-hour period and then measures the specific species of mold that are found in that air. The advantage to this kind of testing, which is sometimes referred to as ERMI testing, environmental relative moldiness index, is that it can identify the exact species of various molds present, and it will identify spores that are not airborne.

However, it is crucial to understand that not all labs that perform the ERMI surface dust test are using the correct methodology. Mycometrics is the most reliable lab and the only one at this point that I can recommend. Although I used to recommend that patients do the surface dust ERMI test themselves, I've found over time that it is best done by a professional to ensure accurate results. Again, unfortunately, this is a very challenging area for clinicians and patients because there are not many qualified and knowledgeable mold inspectors who use surface ERMI testing, and it's not something that patients can reliably do on their own. Please refer to the podcast I did with indoor environmental professional Mike Schrantz for more information, and we'll put a link to that in the resources section. Check the comments on that podcast for updates because there are now some new survey tools that homeowners can use that cannot conclusively determine whether they are likely to have mold in their home but can actually be a fairly accurate indicator of likelihood and that would justify further testing.



Here is a list of steps you can take to minimize biotoxins in the home and improve indoor air quality. Step one is fixing plumbing leaks and other water problems as soon as possible and drying all items completely. Step two is scrubbing mold off hard surfaces with detergent and water and drying completely. Step three is discarding absorbent or porous materials such as ceiling tiles and carpet if they become moldy. Step four is cleaning and repairing roof gutters regularly. That's a really important one. Step five is keeping air conditioning drip pans clean and the drain lines unobstructed and flowing properly. Step six is making sure the ground slopes away from the building foundation so that water doesn't enter or collect around the foundation. Step seven is keeping indoor relative humidity at 30 to 50 percent. Thirty percent will be difficult in most climates, but it's certainly possible to keep it below 50 percent. This may require venting bathrooms. That's always a good idea—dryers, air conditioners. You can also get an inline dehumidifer connected to your HVAC system, and in environments that are damp, that is probably necessary to maintain indoor humidity below 50 percent. Step eight is do not install carpeting in areas where perpetual moisture problems may develop such as in a bathroom. We'll have a patient handout for this, and then the EPA also has good guides, which we will list in the resources section.