

A microscopic view of mold spores, showing several spherical spores with a textured, fuzzy surface. The spores are in various colors, including yellow, orange, and blue, and are set against a dark, textured background. The lighting is dramatic, highlighting the intricate details of the spores.

HEALTH
MEANS®

TOXIC MOLD

HOW TO PROTECT YOUR HOME AND YOUR HEALTH

by HEALTHMEANS

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THE PROBLEM WITH TOXIC MOLD

MOLD, SPORES AND MYCOTOXINS, OH MY!

Mold is a type of fungus that occurs in nature, is ubiquitous and has been around for millions of years. It is an important part of the natural ecosystem that helps with the decomposition of organic matter, such as dead leaves. Many mold species are beneficial to humans or are completely harmless, but some molds produce biotoxins that are harmful and even deadly to humans and animals. These toxic molds have a self-protective mechanism called mycotoxins. When the toxic mold is disturbed or threatened, it will release mycotoxins to defend itself and mold spores to further propagate. Even after the mold is removed, the threat of mycotoxin exposure remains unless the spores and mycotoxins are removed from the environment [1, 2].

Common indoor toxic mold species include *Aspergillus*, *Cladosporium*, *Alternaria*, *Fusarium*, *Penicillium* and less often *Stachybotrys*, aka black mold. These molds produce several toxic metabolites called mycotoxins, including aflatoxins, citrinin, ergot alkaloids, fumonisins, ochratoxins, patulin, trichothecenes and zearalenone. Many of these mycotoxins are so toxic to human and animal life that several governments have developed them into biological weapons [1, 3].

According to the World Health Organization (WHO), “the most important means for avoiding adverse health effects is the prevention (or minimization) of persistent dampness and microbial growth on interior surfaces and in building structures” [4].



Dr. Stephen Redd, the lead CDC scientist on air pollution and respiratory health states, “We do know that exposure to high levels of molds causes some illnesses in susceptible people. Because molds can be harmful, it is important to maintain buildings, prevent water damage and mold growth and clean up moldy materials” [5].



Mold spores are like hardy mold seeds that are invisible to the naked eye. Mold spores enter our homes through open windows, doors and vents, or they hitch a ride inside on our clothing, our pets or items that we bring inside our homes. Every home contains mold spores, but they remain just that, spores, until they germinate and become mold once they gain access to both water and a food source. Our homes contain many potential mold food sources such as drywall, mattresses, carpeting, ceiling tiles, clothing, paper, cardboard and upholstery, just to name a few. When these materials become wet from roof leaks, plumbing leaks, damp basements

or from high humidity and condensation, the mold spores that are present can begin to germinate with mold growth within 24-48 hours. Given the proper conditions, mold can thrive in hidden locations inside your home and, by the time it is noticed, it may have colonized across a basement, an attic, an interior wall, underneath carpeting or above the ceiling tiles [6].

YOUR HOME – ENERGY EFFICIENCY VS. INDOOR AIR QUALITY

Mold has become a bigger problem for homeowners due to changes in how homes are constructed. The energy crisis of the 1970s spurred government regulations by the United States Environmental Protection Agency (EPA) called Energy Star. These regulations encouraged decreased energy consumption through houses that were built tighter with more energy efficiency but with less ventilation. As a result, energy use and cost has decreased but so has ventilation and indoor air quality. In fact, EPA studies show that indoor air is 2-5 times worse than outside air, and in some cases, it can be up to 100 times more toxic than outdoor air. This is especially concerning because we tend to spend 90% of our time indoors [7]. Now with a global pandemic, our time at home has increased even further and our potential daily exposure to mycotoxins has greatly increased.

The EPA has recently introduced an indoor air quality program called Indoor Air Plus. This home certification gives builders guidelines for home builds that are designed to increase ventilation and improve indoor air quality. These building specifications should help with improving home ventilation and reducing indoor toxins [8].



YOUR HEALTH – HOW MOLD MAY AFFECT YOUR HEALTH

Mold exposure affects everyone differently. The health reactions to mold that people have generally fall into three categories:

- 1) **Mold allergies** - This includes typical allergy symptoms such as nasal congestion, runny nose, itchy or watery eyes, but it can also cause sinusitis or trigger asthma and asthma attacks in those susceptible to it.
- 2) **Mold infections/fungal colonization** - Those who are immunocompromised may be susceptible to infections in their sinuses and lungs, which may make them more likely to get additional respiratory infections like bronchitis or pneumonia.
- 3) **Toxic mold illness or sick building syndrome (SBS)** - This mold-based illness from mycotoxins can range from mild to severe and affects many body systems. Symptoms can include fatigue, weakness, aches and pains, muscle cramps, ice pick pain, headaches, light sensitivity, red eyes, blurred vision, tearing, sinus problems, cough, shortness of breath, abdominal pain, diarrhea, joint pain, morning stiffness, memory issues, focus/concentration issues, word recollection issues, learning difficulties, confusion, disorientation, skin sensitivity, mood swings, appetite swings, night sweats, temperature dysregulation, excessive thirst, increased urination, static shocks, numbness, tingling, vertigo, metallic taste and tremors [9] [17].

Symptom severity depends upon many factors, including a person's age, sex, genetics, underlying health conditions, lifestyle, length of exposure time and the level of toxicity of the molds to which they are exposed. In the same environment, some people may be severely affected while others may seem completely unaffected. Those who are the most mold sensitive tend to have full body reactions to mold, which can affect many bodily systems [9-11]. Many scientists have connected chronic fatigue syndrome (CFS/ME) to mycotoxin exposure and the resulting mitochondria damage [12].

PREVENTING TOXIC MOLD



PREVENTING MOLD GROWTH IN YOUR HOME

Your home has its own microbiome just like your gut. Maintaining that healthy balance in your home is important to maintaining healthy indoor air and keeping mold growth at bay. Rule number one in preventing mold growth is to keep your house dry [15].

Here are many ways you can prevent mold growth in your home:

- 1) Keep the humidity level under 50%** - Place humidistats to measure humidity around your home in all the areas that have potential for plumbing leaks, including bathrooms, laundry room, kitchen sink, dishwasher, water heater and basement. Buy and use dehumidifiers wherever needed when indoor humidity reaches 50%. Be sure to maintain your dehumidifiers and to empty and clean them regularly when in use. If you have air conditioning, turn it on when humidity is climbing outside.
- 2) Maintain your heating, ventilation and air conditioning (HVAC) system** - Have your HVAC system cleaned and maintained regularly by a licensed HVAC professional. Be sure the cleaning includes both the furnace and the A/C coils because A/C condensation combined with dust and debris can create an environment for hidden mold to grow. Replace the air filters on your HVAC system every 2-3 months and use a filter with a MERV 11 or 12 rating. That will filter out the most microbes without putting strain on your HVAC system.

- 3) **Keep a clean and decluttered home** - Maintain a clean and decluttered home by minimizing dust, debris and clutter, especially in higher-humidity areas like the basement and bathrooms. Get rid of extra paper and cardboard and use plastic storage bins in the basement, which will better protect your belongings from any water intrusion compared to cardboard boxes.
- 4) **Maintain dry, clean carpeting** - Vacuum your carpet regularly to avoid buildup of debris, dust, mold spores, bacteria and pet dander that mold may grow on. When possible, keep carpeting out of wet areas like bathrooms, kitchens and basements. Better options for those areas include tile, hardwood or luxury vinyl flooring with area rugs that are washable. Mold loves to hide under damp carpeting.
- 5) **Keep the basement dry** - Protect against water intrusion in your basement by preventing water from pooling around your foundation. Install a sump pump to help keep the basement dry when heavy rains happen. It is also a good idea to have a dehumidifier on hand if your basement registers above 50% humidity.
- 6) **Avoid buying homes with a crawl space or a swamp cooler (type of A/C unit)** - Both of these areas of the home are notorious for hidden mold growth. If you have a home with either of these, it is best to have them checked and remediated, or removed if they are an issue.
- 7) **Inspect roofs and attics** - Always check the attic for any unknown roof leaks and get your roof inspected regularly and especially after severe storms. Fix any roof issues immediately because mold can form within 24-48 hours. Be sure your attic is well ventilated so that moisture and heat do not get trapped and create a haven for mold. Some ways to increase attic ventilation are by passive attic ventilation with intake vents (often soffit vents) near the floor of the attic and an outtake vent near the roof peak. This will create a natural flow of air with air coming through intake vents and the hot air rising to be released out of the outtake vent.
- 8) **Address any excess water quickly** - Quickly address any plumbing leaks by stopping the water flow, assessing the damage and removing any saturated drywall or insulation, and continuously use a dehumidifier to help dry the area. Time is of the essence here as mold can form within 24-48 hours. To minimize time in finding leaks, there are water intrusion alarms that sound when they detect moisture. They can be placed under sinks, behind toilets, near the water heater, behind the fridge and in other areas that might collect moisture. These alarms will help alert you to water leaks before you might find them and before mold will have a chance to form. You can get these in a home improvement store or online for approximately \$30-50 for a set of three alarms.

- 9) **Keep bathrooms dry** - Use your bathroom exhaust fans for 30-60 minutes after a shower or bath. Close the bathroom door to help the fan remove the humidity from the room. Be sure your bathroom fans do NOT vent to the attic, or the humid air will build up in the attic space. The bathroom exhaust fan should vent to the outside. Bathrooms are notorious for growing mold due to the frequent humidity and multiple water sources. Be sure to replace any worn caulking around tubs, showers and sinks so that water cannot get under or behind your tubs and sinks.
- 10) **Keep bedding in good condition** - Get a new mattress every eight years and use a full-zip allergy cover over the mattress to help protect it. Regularly wash your pillows in hot water with detergent and borax. Also, every few years buy new pillows and consider using a pillow allergen cover between the pillow and the pillow case.
- 11) **Clean your air ducts** - Think of your HVAC air ducts as the lungs of your home and how important it is to keep your lungs free and clear of debris. Over time dust and debris can build up in your ductwork. This can combine with A/C coil condensation and cause mold growth, resulting in poor indoor air quality. Your network of air ducts is the ideal home-wide distribution system for mold spores and mycotoxins. Be sure to regularly hire a professional air duct cleaning company that uses vacuum suction to clean your air ducts.
- 12) **Keep A/C vents open** - Do not close off vents around the house to push A/C cooling upstairs. You want your entire house to have air flow and ventilation. Closing off vents can cause condensation in your duct work, giving mold a water source to grow.



- 13) **Avoid HVAC humidifiers** - Avoid having a whole-house humidifier because if it's not properly maintained, it can be a source of mold growth.
- 14) **Avoid using wallpaper** - Mold loves to hide behind wallpaper, especially in rooms that have plumbing, such as bathrooms and kitchens. You may think the mold would be visible, but it is often not obvious. The combination of high humidity, wallpaper and microscopic mold spores is a recipe for rapid mold growth. Often, all it takes is one corner or seam of wallpaper pulled up slightly for hidden mold to grow.
- 15) **Have your home inspected** - When buying a new house, be sure to have a professional and experienced home inspector out to look for any signs of water intrusion or home deterioration. If anything seems suspect, be sure to investigate further and consider having a mold test done such as an Environmental Mold and Mycotoxin Assessment (EMMA) or Environmental Relative Moldiness Index (ERMI) test. If you see visible mold or water damage, or it smells musty, there is mold present and you should proceed with caution.
- 16) **Maintain and regularly clean any appliances that use water** - Empty and fully clean any appliances such as humidifiers, dehumidifiers, water filtration units and essential oil diffusers. It only takes two days for mold to form.

17) **Maintain washing machines –**

Pass on purchasing a front-loading washer as they are infamous for harboring mold in their door. If you have one, maintain it meticulously and check for mold growth regularly. The combination of tightly sealed rubber gasket, moisture and accumulating debris allows hidden mold to grow inside the lip of the door. Often the only way you know mold is growing is because it has a lingering musty odor. Top loading washers also need to be cleaned regularly around the inside top part, under the lid and even the agitator (YouTube has several how-to videos). When your load of laundry is done, it's a good idea to leave the washer door open to let any excess moisture evaporate.



- 18) Keep showers, bathtubs and sinks clean** - Regularly clean these areas and quickly address any mold growth. Do not use bleach as that causes mold to release its mycotoxins. Instead use either white vinegar or hydrogen peroxide. If you have a bigger mold patch, you can use stronger food-grade hydrogen peroxide (12%) to clean it up. Be sure to use gloves when handling the 12% hydrogen peroxide as it can burn skin.
- 19) Use air purifiers** - Get a quality air purifier for any rooms where you spend a considerable amount of time, such as the bedroom or family room. Look for a high quality brand such as Air Doctor, Austin Air or IQAir that filters out particles as small as .003 microns. Mold spores range in size from 3-40 microns and will be filtered out by these air purifiers, as will smoke, bacteria, viruses, pollen and dust mites. Leave the air purifiers running in your home 24/7 to keep air filtration and air movement going; the increased energy cost is minor compared to the improvement in your indoor air quality.
- 20) Let in fresh air** - When possible, open up the windows and air out the house on days that outside toxin levels are low; generally outdoor toxin levels are lowest right after a rain. You can check your local air pollution levels on many weather apps.



- 21) Wash pets** - Mold spores and mycotoxins can hide in your pet's fur, especially in breeds with long, thick fur. Mold and mycotoxins can make your pets sick too because pets are smaller and lay on the carpets where mold spores can hide. Pets are often the first to get sick in a toxic home. Be sure to regularly bathe your pets and consider using a non-toxic, mold-removing pet shampoo. You can also use a daily non-toxic mold spray on pets as they come in from outside, especially in fall when mold spores are in high counts. Citrisafe sells non-toxic pet products for this purpose.

- 22) **Watch for moisture in your car** - Cars can easily grow mold because they are sealed up tight and covered in upholstery and carpeting. All you need is a little moisture for mold spores to germinate. Be sure to thoroughly dry out your car if you accidentally leave the windows down and it rains. Dry out wet floor mats. Change out your car's air filter regularly to improve the air quality inside your car.
- 23) **Consider your work environment** - Many people become sick from environmentally toxic workplaces. Always consider any place you spend a significant portion of your time. There are ways to minimize your mycotoxin exposure such as maintenance area spraying (check Biobalance, Citrasafe and Microbalance) and air filtration and purification.
- 24) **Look for the Energy Plus EPA rating** - Look for a new home with a builder that is certified in building Energy Plus homes. These homes are designed for both energy efficiency and improved indoor air quality.



YOUR HOME – TESTING AND TREATING FOR TOXIC MOLD

Visible mold or a musty odor is often the tip of the iceberg for mold growth in a home. If you see or smell mold, chances are there is a major infestation inside the home. The mold is often hidden behind a wall or shower insert. Simply wiping away mold on a porous surface such as drywall is not effective. This is because mold has a multicellular filament structure called hyphae which helps anchor and root the mold into porous materials such as drywall [15]. Carefully inspect the size of the problem; all materials with mold growth will need to be removed, much like a tumor needs to be fully excised from the body. Be sure to wear protective gear such as an N95 mask, enclosed goggles and long rubber gloves because you won't know what kind of mold it is until it is tested in a lab. Whatever you do, do not use bleach; it will cause the mold to spread spores and mycotoxins, thus compounding the problem you are trying to resolve [18]. If the size of the mold growth is under ten square inches, you may be able to carefully remedy the situation yourself. If it is a bigger problem with a whole wall covered in mold or a widespread HVAC infestation, that is a job best left to a professional remediation company with proper gear and equipment.



If you do see mold, you can get a mold test kit and carefully, with proper protective gear, swab the visible mold and send it or a piece of the moldy material in a zip lock bag to a lab, such as Immunolytics, to be cultured. It's important to know the type of mold that you are dealing with so you can remediate your home appropriately and to help figure out which mold healing protocol is necessary to return to health from mold illness.

If you do not see the mold but you highly suspect it based on family health symptoms and/or sick pets, you will need to become a detective and do your best to track down the mold at its source. Here are some possible options to locate hidden toxic mold in your home:

- 1) Visual home inspection** - Look around every room in your house and look at the ceilings and walls. Look for any water stains or signs of damage. Check under and around every sink, toilet and tub/shower for any water damage or rust. Check behind big pieces of furniture that don't move often. Check your attic and your basement and use your flashlight to look into all the hidden corners and crevices. Check your basement and the sump pump, water heater and basement sinks. Think back to any past water intrusions no matter how small and inspect those areas. This is the easiest and cheapest option: you do it yourself and it doesn't cost a thing.

- 2) Mold plate testing** - This is an inexpensive way to do room air testing in every room of your house. You can also tap test your carpets, furniture, mattresses and pets. To tap test, hold the open mold plate in your hand with your fingers extended beyond the lip of the plate. Tap the surface of the area you are testing with your extended fingers five times to disturb any hidden mold spores. The mold spores will become airborne and land on the mold plate's growing surface. After testing, close up the mold plate and place in a warm dark place for five days to see if any mold has grown. If mold has grown, you can send it to the lab for testing and you'll receive a mold report identifying what kind of mold is present. One company that does this well is Immunolytics. If you have visible mold, you can also order a swab test kit to sample it and return to the lab for analysis. A mold plate costs about \$3 and lab testing of the mold plate is around \$30-40 a plate.

- 3) Environmental Relative Moldiness Index (ERMI)** - ERMI is a dust sampling mold test developed by the US EPA that uses DNA analysis to assess the health of a building. It tests for 36 different species of mold and assesses both the quantity and the types of mold found. The ERMI test will give you an index score for how your home ranks compared to other buildings that are water damaged, and you will get a number called an ERMI score as well as a breakdown by mold type. For those who are mold sensitive, ideally the ERMI score should be less than +2. For those who are extremely mold sensitive, the ERMI score would ideally be under -1 [13]. You will also want to look at which molds are present because some that are highly toxic like *Stachybotrys* (black mold) can be toxic at any level. Several labs offer ERMI testing such as Mycometrics. The cost runs about \$285.

- 4) **Health Effects Roster of Type Specific Mold Indicator (hERTSMI)** - This test is similar to the ERMI test but is less expensive since it tests for only five species of mold. However, it does test for the five toxic forms of indoor mold commonly linked to human health issues, aka the Big Five: *Aspergillus Penicilloides*, *Aspergillus Versicolor*, *Chaetomium Globosum*, *Stachybotrys Chartarum* and *Wallemia Sebi*. The hERTSMI test is also often used if cost is a factor or for follow up testing. The cost runs about \$150 [13].
- 5) **Environmental Mold & Mycotoxin Assessment (EMMA)** - EMMA is a dust DNA test similar to the ERMI, but it tests for 10 different pathogenic mold spores as well as 16 types of mycotoxins that are known to be harmful to human health. The EMMA test can give information about the types of molds and the level of mycotoxins present in the home. This is good information to have that will help with both home remediation as well as determining the level of health risk. Realtime Labs offers this test. The cost runs about \$399.
- 6) **Mold inspector** - Hire a knowledgeable and reputable mold inspector who is trained and certified and only does mold inspection (not mold remediation because that's a conflict of interest). There are only six states in the US that require mold inspectors and mold remediators to be licensed (Florida, Texas, Louisiana, Mississippi, Maryland and Tennessee). If you live in a state that doesn't require licensing, there are no state standards for mold inspection or remediation, so buyer beware. What to look for in any mold inspector is experience, knowledge and certification. According to the International Society of Environmentally Acquired Illness (ISEAI), the best indoor air certifications to look for are ACAC, NORMI, AIHA, CIH and CSP because these organizations have high standards, integrity and continuing education requirements. While it can be difficult to find a qualified mold inspector, you can find one by seeking out the certifications above, getting referrals, looking at reviews and asking good questions. Some questions to consider: Who will be coming to your home? What is their experience level and certification? How will they be inspecting and testing for mold? Good mold inspectors will use a home checklist on key areas to inspect and will utilize equipment such as infrared cameras and moisture meters to investigate potential areas with hidden mold growth, such as behind walls and structures. The cost of a mold inspection is typically \$300-500.

All of these methods of mold testing have their pros and cons, but they can offer clues as to what kind of mold and/or mycotoxins are present and at what quantities. Knowing what types of molds and mycotoxins are present can give you clues of where to look in your home based on where those types of mold are usually hidden and can help you make decisions around your mold treatment protocol for you and your home.

I HAVE TOXIC MOLD GROWING IN MY HOUSE – NOW WHAT?

If the mold growth is extensive, it is recommended to call in a reputable mold remediation company. Getting a personal referral is important. You do not want mold remediation done incorrectly because it's an expensive process and you could end up with a continuing or larger mold problem. Criteria to look for in a remediation company are knowledge, experience, references, licenses or certifications. Are they licensed in your state? If they aren't required to be licensed, look for the same certifications as listed in the mold inspection section. Be sure to find out how they remediate and look them up on the local Better Business Bureau website as well as your state attorney general's office to see if there are any complaints filed. You really want to do your homework for mold remediation because it can be an expensive process but an even more expensive mistake if done incorrectly. Mold remediation is complex and not every company has the experience and knowledge of both removing the mold and extinguishing the mycotoxins that make people ill. Many people are incorrectly informed that the mold problem has been resolved, only to have the mold and mold illness return. Find out how the remediation company plans to determine mold levels before and after remediating. Look for their use of credible third-party testing such as the ERMI or EMMA tests. Sites for locating reputable and certified mold inspectors and remediators are the Real Time Labs website and the ISEAI website.



If your problem is localized, you may be able to resolve the situation on your own. Follow these steps:

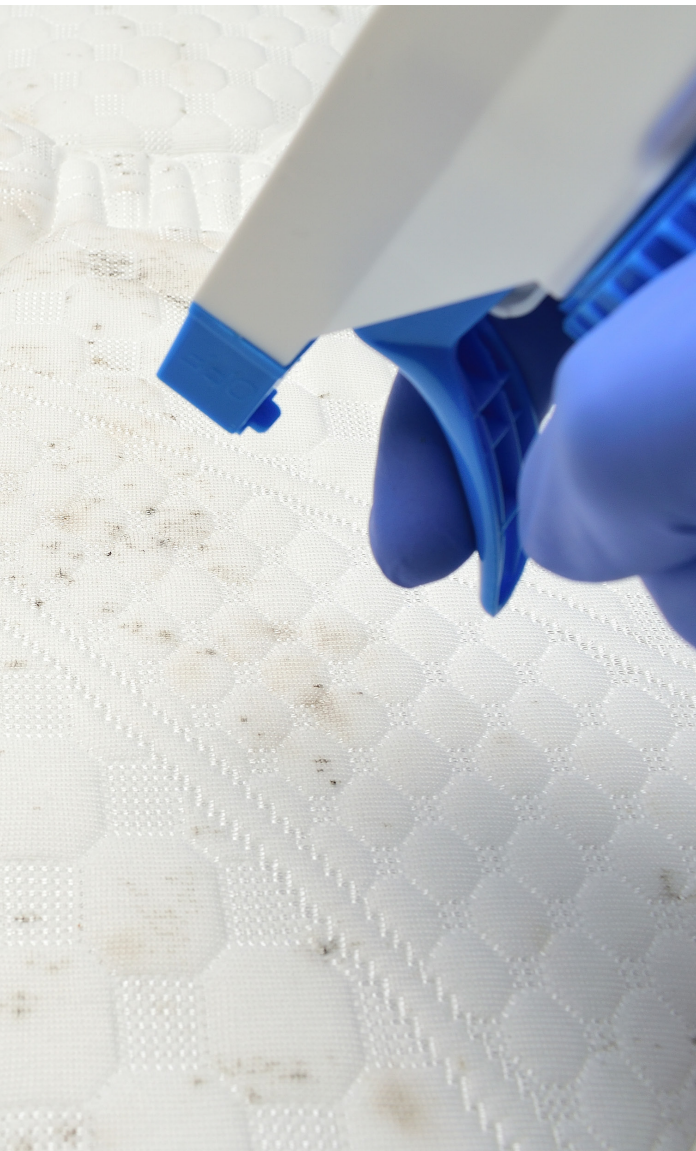
- 1) **Remove** - Be sure to remove any moldy material such as dry wall and/or insulation and take a good two inches beyond where it's located because of the hyphae (filaments) that are below the surface helping it anchor and spread. Be sure you are wearing protective gear for your mouth, nose, eyes and hands/forearms. When the removal is complete, it's a good idea to immediately wash those clothes in hot water with borax or wear old clothing and dispose of it.
- 2) **Treat** - Treat the area with non-toxic products such as BioBalance or Microbalance.
- 3) **HEPA clean up** - Use a HEPA vacuum and microfiber cleaning cloths with a mold cleaner, such as warm water and borax or non-toxic mold products from BioBalance or Microbalance, to clean up all horizontal surfaces, including flooring.
- 4) **Clean the air** - Use air purifiers 24/7 to help clear the air of any mold spores.
- 5) **Maintain** - To maintain a mold-free home, do regular monthly, seasonal or annual maintenance with products by BioBalance or Microbalance.

WHAT ABOUT MY BELONGINGS?

Mycotoxins can penetrate many household belongings. This is problematic because it prevents a mold-sensitive person from getting better even if the home or space has been remediated. Additionally, if you happen to move homes or locations and bring all of your items with you, you are essentially transferring the mycotoxins and creating a new toxic environment [19]. This is called cross-contamination. To avoid this, household items will need to be treated or cleaned and some will need to be tossed. The silver lining? Use this time to declutter and simplify. A good rule of thumb is to sort your belongings into three categories:

- 1) **Paper, photos, books and cardboard** - Toss as many of these as you can. Important paperwork and photos can be either scanned into digital format or stored outside your living area, such as in a garage or separate storage space. With books, it's time to go digital and get rid of your paper books. Antique books that can't be thrown away should also be stored separately from your living space, and when you need to read them do so outside with a mask on. Toss any cardboard storage boxes and store items in plastic containers instead.

- 2) **Metal, ceramic and sealed, non-porous items** - You should be able to keep these items, but they will need to be cleaned with a mold removing solution. To clean electronics, you can bring the item outside, wear an N95 mask and use a computer dusting propellant spray to attempt to dislodge any mycotoxins from the inside of your electronic items.



- 3) **Mattresses, furniture, bedding, curtains, clothing and other porous items** - Get rid of anything you don't need or want. Be sure to clean any remaining porous belongings, including mattresses, curtains, upholstered furniture, pillows, clothing, etc. Some may be salvaged depending upon how mold sensitive you are. Wash what can be washed in detergent and either borax or another nontoxic mold cleaner such as EC3 or Citrisafe. Wash in the proper temperature for the material - the hotter the water the better for mycotoxin removal. You can try nontoxic rug and upholstery mold cleaner on furniture, carpeting, curtains and mattresses. Generally if you can't throw it in the washing machine, be wary of keeping it.

The deep cleaning involved with mold remediation can be extensive, but, if there is mold illness in your family, it's worth it for your health and the additional benefit of decluttering your space.

YOUR HEALTH – TESTING AND TREATING FOR TOXIC MOLD

Have you recently moved and have been sick since? Have you been sick since you had a plumbing leak or basement flood? If so, you may be ill from toxic mold.



If you've been sick and suspect it's from toxic mold, it's a good idea to get tested. Visual contrast sensitivity (VCS) is an inexpensive screening tool that is not diagnostic but can help you figure out if mycotoxins or other toxins are a problem for you. It measures the neurological function of vision (contrast) that is deficient in those with mold illness. You can take this online vision test at home for about \$15. The test was designed by mold illness expert Dr. Ritchie Shoemaker and can be found at this link: <https://www.vctest.com/>

There are also a couple of in-home diagnostic testing options. Both tests are urine tests and results are sent privately via email. Great Plains Lab requires a practitioner's lab request whereas Real Time Labs offers directly to the consumer, depending upon which state you live in. Most insurance companies do not cover these tests. The testing options are:

- 1) **Great Plains Laboratory, Mycotox Profile (\$299)** - This test looks at the levels of 11 different mycotoxins from 40 different mold species that have been known to be harmful to human health.
- 2) **Real Time Labs, Mycotox Profile (\$399)** - This test looks at the levels of 16 different mycotoxins, including nine macrocyclic trichothecenes (black mold mycotoxins).

Each test uses slightly different technology and measures for different kinds of mycotoxins. To get a complete picture you may want to consider getting both tests done, especially if you are not getting well despite mold treatment.

If you have been exposed to toxic mold, it can be a big immune system disruptor. Mold can take advantage of a weakened immune system and colonize and disrupt the microbiome of many places in your body, including your sinuses, lungs and gut. If you have fungal infections in these locations, it is important to treat those, in addition to detoxing from the mycotoxins, to regain your health. Often with mold exposure, the gut microbiome gets out of balance and can result in Candida overgrowth and/or small intestine bacterial overgrowth (SIBO)/small intestine fungal overgrowth(SIFO). Toxic mold exposure is often a comorbidity with an antibiotic resistant staph infection of the sinuses called MARCoNS (multiple antibiotic resistant coagulase-negative staphylococci). Be sure to work with a qualified functional medicine practitioner to help you test for and treat these conditions. It can be hard to clear these infections until you are out of the moldy environment and fully detoxed because the mycotoxins can keep the immune system weak.



TREATING TOXIC MOLD ILLNESS

If you have toxic mold illness, find a mold literate doctor to advise you on a treatment protocol that will work for you. You can locate a mold literate doctor by going to the ISEAI website to search for a practitioner, visiting the lab testing sites mentioned previously and searching for a practitioner, finding a doctor trained in the Shoemaker protocol by visiting www.survivingmold.com or joining Facebook toxic mold groups and asking for patient recommendations. A couple of popular mold Facebook groups to consider are “Toxic Mold Support Group” and “Healing Mold, Lyme, CIRS, MCS and Biotoxin Illness Support.”

Most mold protocols involve three important steps:

- 1) **Get out of the mold-infested environment through effective remediation or moving locations.** It is not possible to heal if you are still living with the toxins.
- 2) **Bind toxins using mycotoxin specific binders.** Binders absorb the toxins and help your body remove them. A few common mycotoxin binders are activated charcoal, zeolite and bentonite clay.
- 3) **Sweat and move daily** to mobilize and detox the toxins through your lymphatic system and out of your skin.



Your mold doctor will advise you on the best binders for the specific mycotoxins you have. Each mycotoxin is detoxed through different detox pathways; different binders will help bind different mycotoxins. This is why mycotoxin testing is so beneficial.

While you are detoxing from mold, it is best to live a clean lifestyle. This helps minimize any additional toxin load on your body. Some clean, mold-free lifestyle ideas are:

- 1) **Eat healthy foods** - Focus on nutritious, whole foods that are low in sugar and mold. Sugar and simple carbohydrates like white bread feed microbes and mold and have little to no nutritional value. Avoid foods that are high histamine or high mold, such as mushrooms, alcohol (especially beer and wine), vinegar, kombucha, kimchi, sauerkraut, yogurt, aged cheeses, corn, coffee and dark chocolate. If eliminating coffee strikes fear in your heart, try mycotoxin-free brands such as Bulletproof Coffee and Purity Coffee.



- 2) **Movement** - Move daily within your fitness level and be consistent. Exercise will help move toxins along and out of the body with your sweat and will help release those happy hormones.
- 3) **Reduce toxins in health and beauty aid (HBA) products** - Think about all the HBA products you put in and on your body and choose nontoxic options. Check out Environmental Working Group's (EWG) website and their Healthy Living app to find brands free from dangerous toxins.
- 4) **Reduce toxins in cleaning products** - As with your personal care products, be mindful of your home cleaning products. The EWG site also lists nontoxic home cleaning products.
- 5) **Minimize stress** - Consider starting or maintaining a daily meditation or mindfulness practice. Some apps to look at are Insight Timer, Calm and HeadSpace.
- 6) **Avoid electromagnetic fields (EMFs)** - Many people with mold toxicity are sensitive to EMFs because mold is sensitive to EMFs. Reduce your EMF exposure by turning off your Wi-Fi at night, removing any phones or electronics from your bedroom and using EMF blockers on your electronics. Consider removing your Wi-Fi router and replace it with hard-wired ethernet connectivity instead.
- 7) **Get restful sleep** - Maximize your sleep quality and quantity by logging 7-9 hours per night. Up your sleep hygiene regimen by sticking to a regular sleep schedule even on the weekends.

The length of time to recover from mold illness depends upon many factors, including your genetics, your lifestyle, the environment you are living in, the type of molds you were exposed to and the exposure time [16]. Some people have a harder time detoxing from mold due to a genetic SNP in their HLA-DR gene. This gene is present in about 24% of the population [20].

ADDITIONAL HEALTH COMPLICATIONS FROM TOXIC MOLD EXPOSURE

Many people exposed to toxic mold may go on to become highly chemically sensitive and chronically inflamed because their immune system is on high alert from the toxin exposure. Some can develop an illness called CIRS (chronic inflammatory response syndrome) named by Dr. Ritchie Shoemaker who discovered the effects of indoor toxins on some of his patients. Others may develop what is known as mast cell activation (MCAD/MCAS) from the mold exposure. Mast cells, which are the immune system's first responders, become easily and repeatedly activated by often benign triggers. It's as if your immune system suffers from post-traumatic stress disorder, with symptoms ranging from mild flushing and gastrointestinal upset to full blown hives and anaphylaxis. If you are looking to do more research, one of the thought leaders in this space is Dr. Lawrence Afrin.

Additionally, there is a lot of overlap between toxic mold illness and chronic Lyme disease. In fact, Dr. Dietrich Klinghardt has stated that he has not had anyone in his Lyme clinic test negative for mold toxicity. This is because they are both immune disruptors. According to Dr. Raj Patel, if you have been treated for chronic Lyme disease and are not getting better, toxic mold could be a contributing factor [21].



SUMMARY

Mold is a part of our natural environment. But when toxic mold growth occurs in our homes and workplaces, our short-term and long-term health can be affected. The best way to reduce indoor mold exposure is to prevent mold growth in the first place by avoiding or quickly addressing any moisture or water leaks. If mold does grow, we hope you can put the information provided in this eBook to use. Dealing with mold and mold illness is a setback you can overcome.





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