# MYMYCOLAB

## IgG and IgE SERUM TESTING FOR MYCOTOXINS

## Andrew W. Campbell, M.D.

**All that is written below is from published medical journals. It is all based on medical and scientific evidence with over 140 references at the end of this monograph.**

Molds produce toxins known as mycotoxins. Molds are ALWAYS present in homes or other places that are water damaged and they are ALWAYS producing mycotoxins.

It is well established in medicine and science that exposure to molds and mycotoxins indoors is hazardous to health, and more so in children and the elderly.

Molds grow on wet surfaces and sporulate. They produce spores of different colors. Molds can grow on dry wall, attics, insulation, basements, underside of carpeting, ventilation ducts, and crawl spaces, and many other places.

Even small amounts of mold growth in an air conditioner or in ducts will result in the occupants being chronically exposed, constantly breathing mold spore and mycotoxins, causing illness. As a result of water damage, a home and/or workplace can also have other factors involved, usually bacteria growing and releasing endotoxins into the ambient air.

When people smell something “musty” or “moldy”, they are actually smelling VOC’s (volatile organic compounds) produced by molds. Chronic exposure to even low levels of molds, mycotoxins and VOC’s, can cause serious health problems.

Diseases caused by fungi (molds) are called mycosis, and fortunately they are not a communicable disease. Mycoses have increased over the last 4 decades as a result of the AIDS pandemic and the advent of chemotherapy, transplantation, immunosuppression with medications including corticosteroids, access to the vascular system, as well as climate change with more floods, hurricanes, storms, etc.

## What Are Mycotoxins?

Mycotoxins are toxins produced by certain molds (fungi). Mycotoxins are odorless, invisible, and tasteless. Mycotoxins can cause a variety of adverse health effects and pose a serious health threat to humans. The adverse health effects of mycotoxins range from acute toxicity to long-term effects such as immune deficiency and cancer. To use an analogy, molds are the gun and mycotoxins the bullet.

Mycotoxins are what mold spores produce to weaken and destroy health. Mycotoxins are very strong and powerful and destructive to our organs and systems.

Mycotoxins can suppress the immune system. The alteration of immune responses due to chronic mycotoxin exposure may also adversely affect the ability of the immune system to fight infections and other environmental challenges. This may explain why patients complain of increased susceptibility to infections and increased responses to chemical irritants. Patients may report more sensitivity to a number of chemicals, odors, etc.

It has been well documented in the literature that water intrusion from leaky roofs, pipes, windows, poorly maintained flashings, flooding from leaking washer, dishwasher, ice maker, etc. in the home as well as in the workplace cause mold growth with the subsequent addition of mycotoxins. Reports of exposure include homes, office buildings, courthouses, hospitals, hotels, schools, and universities.

The effects of filamentous molds and mycotoxins on human health have been written about for centuries. An excellent protocol on what to do with a dwelling affected by mold can be found in chapter 14 of Leviticus in the Bible.

## MY EXPERIENCE

My experience is from treating over 14,000 patients suffering from the effects of molds and mycotoxins. As you can imagine, I have seen quite a diversity of cases and have treated all kinds of patients affected by molds and mycotoxins. My patients range from age 1 to 96 years old. I know what works and I know what doesn't work. I base all my diagnosis and treatments on medical and scientific evidence, not on opinions found on the internet or books that have been written for the public but that have not gone through the rigorous peer review process to see if what is written in them is valid in medicine and science or not. Most of my patients are back to normal in 6-8 months of treatment, not years.

There are several videos available on the Mymycolab website where I discuss molds and mycotoxins. I have also published almost 100 studies in medical journals, chapters in medical textbooks, and am the editor-in-chief for several peer reviewed medical journals.

**Mymycolab testing gives results for 12 different mycotoxins in blood serum, both IgG and IgE antibodies, for a total of 24 test results. It is the most accurate test available for mycotoxins.**

How a person reacts to molds and mycotoxins depends on that person's health and nutritional status, if they have other medical conditions, and how long was the exposure.

It is important to know that one mold can produce a number of different mycotoxins and one mycotoxin can come from several different molds. It is not a one-to-one ratio.

Mycotoxins are not easy to get rid of. It takes heat at 500 degrees Fahrenheit (260 degrees Celsius) for half an hour or fire at 900 degrees Fahrenheit (482 degrees Celsius) for 10 minutes to destroy trichothecene mycotoxins. Ozone is supposed to get rid of all or most mycotoxins, but the level of ozone needed is toxic to humans. HEPA filters do not remove mycotoxins from the air, though activated carbon filters can help. This is due to the size of mycotoxins: 0.1 microns. As a comparison, human hair is about 100 microns and mold spores about 2-3 microns.

## Can mycotoxins come from foods and beverages?

The short answer is no. Many patients ask if molds and mycotoxins can come from foods and beverages. It is possible, but the amounts are parts per billion. To visualize this, cover 100 football fields with one layer of golf balls. One part per billion is removing one golf ball. Foods and beverages may contain less than 10 parts per billion. It is too little an amount to affect people's health and is easily and quickly excreted in urine.

According to the National Institute for Occupational Safety and Health (NIOSH), a part of the Centers for Disease Control and Prevention (CDC), low levels of mycotoxins are found in many foods. For that reason, they are routinely present in the urine of healthy people. Therefore, it does not mean that the person is suffering from any disease or disorder related to molds or mycotoxins.

The most important point is that if you have mycotoxins in urine, it is a good thing: the body is doing its job of getting rid of tiny amounts of mycotoxins from foods and beverages. Urine is an excretion, it

how the body gets rid of things. For example, a study from July 2021 shows that in samples of pasteurized and unpasteurized milk from cows, 92% had one or more mycotoxins. However, the levels of mycotoxins were all below maximum allowable levels set by the Federal Government, showing that this is all easily excreted.

## Mycotoxins Are Linked to Many Illnesses:

### Autism:

Exposure to molds and mycotoxins have been linked to Autism Spectrum Disorder (ASD). Autism is slowly but surely increasing, currently at one in 54 children. A published study looked at 172 children with ASD and 61 controls. The authors showed significant differences comparing mycotoxin antibody levels between the two children's groups, with the ASD group having much more elevated levels of mycotoxin antibodies. In a subsequent study of ASD, these researchers linked ASD to ochratoxin. We have many case reports where autistic children have improved after treatment for mycotoxins. The mycotoxins in these studies are tested for by Mymycolab.

### Alzheimer's disease:

Exposure to molds and mycotoxins have been linked to Alzheimer's disease (AD). In autopsies conducted on persons who died with Alzheimer, a significant percentage were found to have mycotoxins in the brain. There are a number of published studies linking AD to mycotoxins.

### Autoimmune Disorders

Antibodies to mycotoxins can form adducts and bind to human tissues, triggering autoimmunity. Many patients suffering from autoimmune thyroiditis, Addison's disease, lupus, MS, etc. may have been affected by mycotoxins. If the test for antibodies is positive, then the patient should be treated for the mycotoxins and the autoimmune reaction can fade away.

### Chronic sinusitis

It has been demonstrated in studies that molds cause sinusitis and that this is much more common than what was previously thought. A publication from the Mayo Clinic showed that 96% of chronic sinusitis is caused by molds.

## Amyotrophic Lateral Sclerosis (ALS, Lou Gehrig's Disease)

The well-known scientist at Cambridge University, Dr. Stephen Hawking, who recently died suffered from this disease. It is a progressive and fatal disease and approximately 90% cases of ALS are sporadic, possibly caused by mycotoxins, with 5-10% due to genetic mutations. A 2019 published review of ALS looked at exposure of neurons (brain cells) to mycotoxins showing how these mycotoxins can cause ALS.

## Asthma

Asthma is frequently a result of exposure to molds and mycotoxins, especially in children and also in adults.

## Demyelination in the Brain and Peripheral Nervous System

There are many published studies demonstrating that the effects of mycotoxin that can result in demyelinating diseases. In one such study of 119 patients exposed to molds and mycotoxins, all tested positive to mycotoxins antibodies, and all had demyelination, and there are many more publications. This demyelination can result in Chronic Inflammatory Demyelinating Polyneuropathy (CIDP), or mimic Guillain Barre Syndrome.

## Multiple Sclerosis (MS)

Studies have shown that exposure to molds and mycotoxins is a risk factor in MS and other autoimmune diseases. Rutgers University Medical School and other medical centers have published studies showing how mycotoxins can cause MS.

## Mastocyte Activation

IgE antibodies to mycotoxins affect mast cell and can lead to Mast Cell Activation Syndrome. The IgE antibodies to mycotoxins also trigger mast cells to release pro-inflammatory cytokines (interleukins).

# MISDIAGNOSIS OF SEVERAL MEDICAL CONDITIONS

## LYME DISEASE

Many patients suffering from Lyme disease Chronic Lyme disease may have mycotoxicosis, or both. The symptoms for both are very similar, and when the treatment for Lyme, which is a bacteria, fails to cause a significant improvement in a person, the reason may be that it is mycotoxins actually causing the problem. This is why I published an article in 2019 about how to tell if a patient has Lyme disease or mycotoxicosis. It is included in the references.

## CHRONIC FATIGUE SYNDROME AND FIBROMYALGIA

Many patients get misdiagnosed with Chronic Fatigue Syndrome, Fibromyalgia, and others. The accuracy and specificity of IgG and IgE antibodies to mycotoxins is of the highest levels available and will help any clinician in the differential diagnosis of many medical conditions.

## HORMONES AND MYCOTOXINS

The chronic inflammatory response from mycotoxin toxicity can affect hormones in men and women. There is upregulation of the enzyme aromatase, which is responsible for the last steps of estrogen biosynthesis from androgens (i.e., testosterone), resulting in the increased conversion of testosterone to estrogen.

All estrogens need the appropriate function of the liver and of cytochrome P450 enzymes to enable them to be metabolized. Cytochrome P450 enzymes are essential to the body to detoxify. Mycotoxins block P450 enzymes, making it much more difficult for the body to get rid of toxin, but also affecting estrogens.

T-2 mycotoxin, part of the trichothecene family of mycotoxins, has been shown in studies to decrease testosterone biosynthesis and secretion. Alternariol mycotoxin is antiandrogenic, meaning it reduces the effects of testosterone, as does Ochratoxin and Deoxynivalenol aka Vomitoxin.

Another factor is that mycotoxins can affect the thyroid hormone and this is more common than many clinicians realize. Also, from what is written above, mycotoxins can cause autoimmunity; therefore,

autoimmune thyroiditis is found in patients affected by mycotoxins. In these cases, after treating the patients for mycotoxins, the autoimmune thyroiditis fades away.

## BLOOD TESTING FOR ANTIBODIES TO MYCOTOXINS

Blood serum testing for mycotoxin antibodies have been used for over 20 years and are highly accurate. The specificity and sensitivity of blood serum testing for the presence of IgG and IgE antibodies to mycotoxins in the blood are of the highest degree.

Each mycotoxin antigen at Mymycolab is validated according to the highest standards as set by law.

The Federal Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) regulations at 42CFR493 and the FDA state:
"All assays that are introduced into the clinical laboratory must have established and verified method performance specifications before patient testing is performed."

More specifically:
"Prior to reporting patient test results, the laboratory must verify or establish, for each method, the performance specifications for the following characteristics: accuracy, precision, analytical sensitivity and specificity; the reportable range of patient test results; the reference ranges; and any other applicable performance characteristic."

Each mycotoxin is validated individually rather than in sets as is done in other laboratories. To ensure accuracy of reference ranges, each mycotoxin has to be validated against its own standard.

**IMPORTANT:**

**A PERSON'S HEALTH CANNOT BE RESTORED IF THEY CONTINUE TO BE EXPOSED TO MOLDS AND MYCOTOXINS. TREATMENT WILL NOT WORK UNDER THOSE CONDITIONS.**

**THESE ARE THE IgG and IgE MYCOTOXINS ANTIBODIES MYMYCOLAB TESTS IN BLOODSERUM FOLLOWED BY AN EXPLANATION OF EACH MYCOTOXIN.**

1. Satratoxin
2. Verrucarin and Verrucarol

3. Ochratoxin (A and B)
4. T2 Toxin
5. Vomitoxin aka Deoxynivalenol
6. Cladosporium toxin (Cladosporium HSP 70)
7. Alternaria toxin (Alternariol)
8. Aspergillus Toxin (Aspergillus hemolysin)
9. Aspergillus Auto-Toxin (Sterigmatocystin)
10. Penicillium Toxin (Mycophenolic acid)
11. Asp/Pen Neuro Auto-Toxin (Gliotoxin)
12. Stachybotrys Toxin (Trichothecene)

**A <u>brief</u> explanation of each mycotoxin:**

**Satratoxin**: is a trichothecene mycotoxin mainly produced by Stachybotrys, also known as "black mold" and is one of the most potent mycotoxins. It is known to cause neurotoxicity and inflammation in the brain and induces apaptosis of the olfactory sensory neurons.

Satratoxin can cause fatigue, headaches, nosebleeds, pulmonary hemorrhage, chest pain, moist dermatitis, and fever. It is neurotoxic and causes neurocognitive symptoms. Individuals exposed to Satratoxin can develop a chronic immune response (inflammation and oxidative stress) leading to brain and nerve cell damage.

**Verrucarin and Verrucarol**: are trichothecene mycotoxins mainly produced by Fusarium and Aspergillus species and are known to cause tremors, immune toxicity, inflammation, are cytotoxic, and are potent protein synthesis inhibitors.

**Ochratoxin**: can cause immune suppression, lung disease, urinary tract tumors, and is toxic to kidneys, liver, and is carcinogenic (causes cancer). This is due to its ability to affect DNA and inhibit protein synthesis. Ochratoxin can potentiate the effects of IL-1β on IL-8 secretion with a range of 35% to 138% increase and augments the transepithelial passage of commensal bacteria with a 12- to 1522-fold increase.

Studies have shown it causes leaky gut syndrome and changes the nutrients that are absorbed from foods. It cannot be excreted in urine. The highest Ochratoxin levels are found in breast milk.

**Ochratoxin's major targets are:**
Liver
Kidney
Brain
Skeletal muscle

Fat tissue
Ochratoxin crosses the placenta.

**T2 Toxin:** are trichothecene mycotoxins and are the only mycotoxins that have been used in biological warfare. They can cause diarrhea, vomiting, and intestinal hemorrhage, as well as changes in reproductive cycles and infertility. This mycotoxin is known to decrease testosterone.

**Vomitoxin aka Deoxynivalenol**: are trichothecene mycotoxins and can destroy intestinal barrier function, resulting in anorexia, inflammatory bowel disease and celiac disease. They can increase IL-8 secretion with a 10- to 15-fold increase. This mycotoxin can affect both estrogen and testosterone.

**Cladosporium Toxin** (Cladosporium HSP 70): The airborne spores of Cladosporium species are significant allergens, and they can severely affect asthmatics and people with respiratory diseases. Cladosporium also produce volatile organic compounds (VOCs), which are neurotoxic. Severe headaches, seizures, and sleepiness are the most common clinical manifestations.

**Alternaria Toxin** (Alternariol): is cytotoxic (toxic to cells), mutagenic (causes mutations), genotoxic (genes), and causes immune suppression. This mycotoxin is also known to form reactive oxygen species (ROS), causing inflammation, and to lower testosterone.

**Aspergillus Toxin** (Aspergillus Hemolysin) can cause immune suppression and is carcinogenic. It is toxic to cells (cytotoxic) especially neutrophils and macrophages. It is a hemolytic mycotoxin, meaning it destroys red blood cells.

**Aspergillus Auto-Toxin** (Sterigmatocystin) carcinogenic (causes cancer), mutagenic (causes mutations), and teratogenic (causes malformations of the fetus), hepatotoxic (liver); can cause autoimmune diseases.

**Penicillium Toxin** (Mycophynolic acid): can cause immune suppression.

**Asp/Pen Neuro Auto-Toxin** (Gliotoxin): can cause immune suppression, neurotoxicity (has been linked to multiple sclerosis and others), and immune toxicity. It is toxic to genes (genotoxic) and show potent cytotoxic activity against white blood cell (leukocytes) such as macrophages and polymorphonuclear leukocytes at extremely low concentrations.

**Stachybotrys Toxin** (Trichothecene): Trichothecene mycotoxins can

cause the following:
Vascular system: increased vascular fragility (blood vessels), pulmonary hemorrhage or hemorrhage into body tissues.
Nervous system: tremors, headaches, seizures, sleep disturbance, incoordination, and depression. It can also cause demyelination of nerves leading to Chronic Inflammatory Demyelinating Polyneuropathy (CIDP).
Digestive system: vomiting, diarrhea, liver toxicity, intestinal hemorrhage, and anorexia. It is a cause of intestinal permeability.
Cutaneous (skin) system: rash, photosensitization, sloughing of skin, burning sensation.
Endocrine system: decrease in testosterone in men and women; increase in estrogens in men and women.

# IgG and IgE ANTIBODIES: WHAT IS THE DIFFERENCE?

## Basic Immunology of IgG and IgE antibodies

In Microbiology, there are 4 classic pathogens that cause an immune response:

1. Bacteria
2. Viruses
3. Pathogenic fungi (i.e., Aspergillus, Penicillium, etc.)
4. Parasites

The immune system will make antibodies to these and once the infection is over, it will remain in "memory" as an IgG antibody. For example, if you had the chicken pox as a child, you would still have antibodies to this virus as an adult. These 4 pathogens a living, have cell walls, etc.

Toxins are a group of molecules; they are not alive, do not have cell walls, etc. Therefore, the immune system will make antibodies to toxins as long as they are present in the body. Once the toxins are cleared from the body, the antibodies fade away. This is a major difference between microbiology and toxicology.

### What is IgG?

Immunoglobulin G (IgG) is the predominant immunoglobulin present in human serum. This immunoglobulin constitutes approximately 75% of total serum immunoglobulin. IgG is the only immunoglobulin that can cross the placenta in humans, and it is largely responsible for protection of the newborn during the first months of life. Because of its relative

abundance and excellent specificity toward antigens, IgG is the principal antibody used in clinical diagnostics and immunological research.

## What is IgE?

The immunoglobulin E (IgE) antibodies to mycotoxins are often associated with allergies. IgE antibodies to mycotoxins cause mast cells to release histamine, heparin and other compounds called cytokines. These cytokines cause inflammation and can trigger what is known as mast cell activation. Mast cells are located near blood vessels, nerves, and the lymphatic system. Many inflammatory diseases involve mast cells, such as arthritis, atopic dermatitis, psoriasis and multiple sclerosis.

Mycotoxins also cause immune complex issues leading to inflammation, as well as mitochondrial cytophathy where mitochondria cause cell death, endocrine disruption, and others.

**The following list are common symptoms caused by mycotoxins:**

- Fatigue, usually mode worse by exercise
- Short-term memory loss
- Headaches
- Confused easily or changes in ability to learn Blurred vision
- Seizures
- Loss of equilibrium
- Light headedness
- Feeling “spaced out”
- Sleep disturbance
- Tremors
- Numbness and tingling in hands and fingers, feet and toes Twitching muscles
- Ringing in ears
- Intolerance to alcohol Decreased libido
- Low testosterone
- Sores that will not heal Bruise easily
- Joint aches and pains Shortness of breath, cough
- Abdominal pain and discomfort, diarrhea, nausea
- Irritable bowel syndrome
- Hair loss
- Nosebleeds
- Skin rashes, Hives
- Itchy skin

- Chronic sinusitis
- Recurrent flu-like illnesses Painful lymph nodes
- Severe nasal and other allergies Abnormal weight gain
- Low grade fever or feeling hot
- Uncomfortable urination
- Dry eyes and mouth
- Frequent canker sores
- Cold hands and feet
- Thyroid inflammation

Multiple sensitivities to medicines, foods, chemicals, etc. And:… pets

get sick from mycotoxins too…

## Blood serum testing for mycotoxin antibodies and Autoimmunity

Antibodies to mycotoxins form adduct and bind to human tissue, triggering **autoimmunity.** Therefore, the measurement of antibodies in blood serum against mycotoxins is clinically much more meaningful than measuring metabolites of mycotoxins in urine. Dr. Ari Vojdani of Immunosciences Laboratories, an eminent scientist and author of more than 200 published articles, has stated this emphatically.

### WHY URINE TESTING FOR MYCOTOXINS IS INACCURATE AND CLINICALLY NOT RECOMMENDED

According to the National Institute for Occupational Safety and Health (NIOSH), and the Centers for Disease Control and Prevention (CDC), low levels of mycotoxins are found in many foods. For that reason, they are routinely present in the urine of healthy people. Therefore, it does not mean that the person is suffering from any disease or disorder related to molds or mycotoxins. The urine test does not measure mycotoxins, it measures metabolites of mycotoxins. What does that mean? When a person eats asparagus for lunch and the urine smells of asparagus for the rest of the day, those are asparagus metabolites.

A recent study published in the medical journal Toxins showed that milk, either pasteurized or unpasteurized, can contain mycotoxins, with anywhere from 1 to 4 mycotoxins. None were above the Total Daily Intake limits set by government agencies worldwide. These are safe levels and excreted in urine and don't accumulate in the body.

Urine levels of mycotoxins mean excretion: it does not mean pathology. Furthermore, some mycotoxins cannot be measured in urine, such as ochratoxin. Almost all, 99.8%, of the ochratoxin in the body is very tightly

bound to the body's main protein, albumin, so it cannot be excreted through the kidneys. It is reabsorbed from any part of the nephron by both active and passive transport and by passive diffusion. Even so, there are laboratories offering urine testing for ochratoxin and it is the most commonly found in urine test even though it cannot be excreted in urine.

The FDA has not approved any urine test for mycotoxins. The CDC warns that such tests have not been approved for diagnostic purposes and have not been validated, meaning that you can't trust them to tell you if anything is wrong with you or what to do about it.

**Please see the following link:**

CDC: Morbidity and Mortality Weekly Report (MMWR)
Notes from the Field: Use of Unvalidated Urine Mycotoxin Tests for the Clinical Diagnosis of Illness — United States, 2014.

https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6406a7.htm

# WHAT TO DO IF YOU THINK YOU HAVE BEEN AFFECTED BY MOLDS AND MYCOTOXINS

The first step is to use the first rule of toxicology:

**REMOVE THE TOXIN FROM THE PATIENT OR THE PATIENT FROM THE TOXIN.**

Mycotoxins are not easy to get rid of. It takes heat at 500 degrees Fahrenheit (260 degrees Celsius) for half an hour or fire at 900 degrees Fahrenheit (482 degrees Celsius) for 10 minutes to destroy trichothecene mycotoxins. Ozone is supposed to get rid of all or most mycotoxins, but the level of ozone needed is toxic to humans. HEPA filters do not remove mycotoxins from the air; activated carbon filters can help filter mold spores. This is due to the size of mycotoxins: 0.1 microns. As a comparison, human hair is about 100 microns and mold spores about 2-3 microns.

## MOLD TESTING AND REMEDIATION

Mold testing and remediation are not standardized in the U.S. Testing of an indoor space for airborne mold spores reveals what is present at the time of the testing, not 24/7, and can vary hour by hour depending on the activity in the room. It does not divulge any hidden mold, such as those in wall cavities, attics, in ventilation ducts, and others. Remediation can be effective or ineffective, depending on what company you choose. It is a frustrating search for anyone involved.

It is important to note that the Environmental Protection Agency (EPA) cautions that 50% of fungal growth can be hidden, meaning hidden from sight. In addition, ERMI testing is widely misunderstood:

U.S. ENVIRONMENTAL PROTECTION AGENCY

**OFFICE OF INSPECTOR GENERAL**

**Public May Be Making Indoor Mold Cleanup Decisions Based on EPA Tool Developed Only for Research Applications**

**Report No. 13-P-0356 August 22, 2013**

**Public May Be Making Indoor Mold Cleanup Decisions Based on EPA Tool Developed Only for Research Applications**

## Where do Mycotoxins Attack First?
## THE BRAIN

Mycotoxins have a significant toxic effect on the central and peripheral nervous systems. Studies have demonstrated that mycotoxins can cause loss of myelin leading to multiple sclerosis- like symptoms and chronic inflammatory demyelinating polyneuropathy (CIDP). It is common for patients to complain of neurologically related symptoms such as headache, blurred vision and other visual problems, brain fog, numbness and tingling, short- term memory loss, tremors, and many others.

If a patient has neurologically related symptoms, a neurological examination may show hyper- or hyporeflexia, loss of sensation in the extremities to pinprick, soft touch, and/or vibration, anisocoria, sluggish pupillary reflexes, and others. If these are physical findings are present, serum neuronal antibodies testing should be ordered to rule in demyelination.

Neurophysiological testing is very effective in pinpointing potential causes of the neurological effects of mycotoxins. Nerve conduction velocities can detect demyelination in the peripheral nerves of the upper and lower extremities and is more effective and sensitive than an EMG.

**Brainstem Auditory Evoked Potential Testing**

Brainstem auditory evoked potential testing give information on the cochlea and auditory pathways to the brain, neuronal activity of the auditory nerve, cochlear nucleus, superior olive, inferior colliculus of the brain. Published studies have shown that these are key parts of the brain affected by mycotoxins.

**Visual Evoked Potential Testing**

Visual evoked response testing measures the functional integrity of the visual pathways from the retina to the visual cortex via the optic nerves. It can detect optic neuritis due to demyelination, optic atrophy, and myelin plaques of the optic nerve common in multiple sclerosis. These better quantify functional integrity of the optic pathways than scanning, i.e., MRI.

An effective treatment for demyelinating disorders is intravenous gammaglobulin. I have found that Gamunex given at O.4 gms/kilo/dose once weekly for 6 weeks is an effective treatment. This should be repeated until the patient's demyelination improves or is no longer evident by testing.

# Treatment Guidelines

It is very important to control and minimize environmental exposure to many toxicants:

Processed foods

Artificial sweeteners, colorings, preservatives in foods and beverages

Heavy metals

Living near golf courses, factories, agriculture areas where pesticides are regularly used

VOC's

EMF exposures

Living near freeways or heavy traffic

**First and foremost:** apply the first rule of toxicology: get the patient away from the toxin or the toxin away from the patient.

**Second:** simultaneously build up the immune system while killing the fungi.

- Diet
- Probiotics: use spore forming bacilli.
- Boosting the immune system: immunotherapy with nutrients, vitamin D3 and B complex, magnesium, omega 3's, CoQ10, zinc, melatonin, and others.
- Anti-fungal treatment: systemic and/or intranasal
- Phosphatidyl serine
- Infrared sauna: start low and go slow.
- If a brain SPECT scan shows decreased perfusion of certain lobes of the brain, I recommend nitric oxide, specifically Neo-40.

Approximately 80% of the immune system is in the gut, so this is a primary place to begin. The main components are diet, supplements, and probiotics.

- A publication from Reading University with the Food Safety Authority of the United Kingdom, in essence the FDA in England, showed that less than 10% of the usual commercial strains of Lactobacilli and Bifidobacterium in probiotics are able to get to the colon.

- The vast majority of probiotics are trying to stand above the others by including more strains and more cfus.

However, there is no scientific rationale for this. There are no studies that have shown that 200 billion CFU is more effective than 10 billion cfu's and that 15 strains are more effective than 5 strains.

**Studies in humans show the following benefits from Bacillus spores:**

- Effective treatment for small intestinal bacterial overgrowth (SIBO).

- Reduced incidence of irritable bowel syndrome diarrhea.

- Improvement in pain scale in Rheumatoid arthritis patients.

- Immune modulation for childhood allergies.

- Immune stimulation of peripheral T-lymphocytes and B-lymphocytes.

## DIET

Diet: Try gluten free for 90 days.
Avoid dairy.

An important component of treatment is not to add more substances that cause the immune system to react, especially chemicals or foreign substances in foods and beverages. Artificial coloring, artificial flavoring, artificial sweeteners, chemical preservatives, should be eliminated from the diet. Organic foods are best. Preferable cooking methods are boiling, or oven cooked meals, including broiling. Eliminate as much as possible coated pans and cooking utensils. Plastic bottles and canned foods should not be used: they contain bisphenols, etc. Liquids should be limited to water as much as practical, and do not drink tap water. As much as possible, drink water from glass bottles or glass containers.

## BOOSTING THE IMMUNE SYSTEM

This is best done with supplements and is dependent on the immune status of each patient. Choosing a supplement from a reputable supplier is paramount: over-the-counter supplements are discouraged, as their provenance is unknown. Melatonin, vitamin D3, vitamin C, B complex vitamins, phosphatidyl serine, fish oils, magnesium, are all very helpful. Zinc is an essential nutrient of the immune system.

## ANTI-FUNGAL MEDICATION

A broad spectrum anti-fungal medication such as itraconazole can in many cases be helpful. It may be necessary to use such an anti- fungal for longer periods of time depending on each patient's response. However, in some cases, one can also try a non- pharmacological anti-fungal supplements. My experience with over 14,000 patients is that itraconazole is safe and very effective. In my patients, I give it until they say they are well. This may take several months.

## PROTOCOLS: They don't work

Everyone's immune system is unique and different. If you put 10 people in a room together, all the same height and weight, all born in the same month and year, and you expose them to one substance, you will get 10 different immune reactions. This is why protocols don't work. They are basically like a recipe, one size fits all, where the same treatment is given to a young woman 22 years old who weights 110 pounds and to a man 55-year-old weighing 210 pounds.

## BINDERS:

There is **no** clinical medical or scientific evidence that binders work and there are no published medical or scientific studies that show it is a valid treatment in humans. Mycotoxins first affect the brain and nervous system, and second, the lungs; binders do not remove the mycotoxins from the brain or from the lungs. I get about 5 emails daily from people who write me that they have followed this doctor's or that doctor's protocol and have been on binders for up to 2 and 3 years with little progress. Most of my patients are well within 6 months, not 2 and 3 years.

## USELESS TESTS:

There is no medical or scientific evidence that molds or mycotoxins have a genetic component called HLA. There are some "experts" that say 25% of the population has a gene that makes them more susceptible to the effects of molds. The U.S. population is around 333,000,000 people so this means that 83 million Americans are supposed to suffer from this defect, yet there are no published studies on this, no medical books, it is not taught in any medical schools, there are no organizations that study this defect. Let's take another disease and this one affect only 34 million Americans, almost 50 million less. This disease is taught in every medical school in the world, has medical books about it, has over 600,000 published studies, and there are organizations, both medical and public that discuss it. What is this other disease that affect much fewer Americans? Diabetes. So don't believe these "experts" that say this is real. There are other tests that they order that have little or no clinical validity.

**Cholestyramine is not recommended for the following reasons:**

1. Cannot be taken by patients with the following conditions:
   Hypothyroid patients
   Diabetics
   Liver disease
   Kidney disease
   Nephrotic syndrome
   Alcoholism

2. Interferes with the absorption of the following medications:
   Thyroid medication
   Estrogens
   Progestins
   Diabetic medications
   Antibiotics
   Phenobarbital
   Thiazide diuretics
   Warfarin
   Digitalis
   Spironolactone

# References:

**The references are in 2 parts; the first are published articles that A.W. Campbell, M.D. authored or co- authored. The second part are the references for all that is written above.**

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