Are ADHD and Dementia Preventable Diseases?

Environmental chemicals adversely impact mental and physical health.

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ADHD, [Depression](http://www.psychologytoday.com/basics/depression/symptoms), Anxiety, [Fibromyalgia](http://www.psychologytoday.com/basics/chronic-pain), Chronic Fatigue Syndrome and [dementia](http://www.psychologytoday.com/basics/dementia) all share one common denominator in the scientific literature: they can all be triggered by exposure to environmental toxins. All of us are continuously exposed to internal and externally produced toxins, yet not everyone feels their effects. Why is that? Some individuals, whether due to their [genetics](http://www.psychologytoday.com/basics/genetics), total load of these toxins, or their inability to properly detoxify these chemicals, become ill when the load of toxic substances reaches a certain level. Clinical manifestations can include fatigue, joint and muscle pain, paresthesias (tingling and numbness), [cognitive](http://www.psychologytoday.com/basics/cognition) dysfunction, mood disorders such as anxiety and depression, loss of balance and/or incoordination, visual and auditory symptoms, abdominal and urinary symptoms, cardiac symptoms such as chest pain and palpitations, as well as severe[psychiatric](http://www.psychologytoday.com/basics/psychiatry) manifestations including [Bipolar disorder](http://www.psychologytoday.com/conditions/bipolar-disorder) and [Schizophrenia](http://www.psychologytoday.com/conditions/schizophrenia). Since most physicians do not screen for environmental chemicals when a patient comes in complaining of the above symptoms, these chemical compounds often remain hidden from view, silently affecting our mental and physical health. But how significant is our actual exposure? Do these toxins really play a role in affecting our long-term health, causing chronic illness?

Bottom of Form

Scientific studies have demonstrated that we are exposed to many of these environmental toxins on a daily basis. Whatever chemicals that have found their way into the external [environment](http://www.psychologytoday.com/basics/environmental-psychology) will invariably find their way into our bodies. We breathe them in, ingest them from the food and water supply, or absorb them through the skin, and we ultimately become what we eat, drink, breathe and touch. The growing list of toxins that can affect our health include industrial chemicals and combustion pollutants (i.e. halogenated hydrocarbons such as PCBs), over 800 different pesticides, insecticides and herbicides, multiple [endocrine](http://www.psychologytoday.com/basics/hormones) disrupters (PCBs, DDT, Bisphenol A, plastics and phthalates), heavy metals, as well as food additives, preservatives, and [drugs](http://www.psychologytoday.com/basics/psychopharmacology). So the problem is not just one individual toxin, but all of these toxins simultaneously affecting our bodies. They are also fat-soluble, and can accumulate in the [brain](http://www.psychologytoday.com/basics/neuroscience) and peripheral body tissues reaching much higher doses than environmental concentrations would suggest, as well as acting in an additive manner if they exert their toxic effects through the same biochemical pathways. These environmental toxins act as xenoestrogens (foreign-based estrogens), and have been linked to a variety of cancers, including cancer of the breast, prostate, lung, colon, cervix and uterus. Others such as heavy metals have long-term profound health effects, causing neurocognitive deficits, with the scientific literature showing an association with [ADHD](http://www.psychologytoday.com/basics/adhd).

When we do a medical literature review, we find frequent studies showing significant toxin exposure and their effects on our health. A 1997 Mercury Study Report to Congress found that in the mid-1990s we were dumping 158 tons of mercury into the environment every year. In 1999 the EPA’s Office of Prevention, Pesticides, and Toxic Substances reported that over 4 billion pounds of pesticides are used annually in the U.S. This amounts to eight pounds for every individual in the U.S. each year. If you want to give a laboratory rat Parkinson's disease, immune dysfunction, or cancer, scientific studies have shown that you can do so just by exposing it to one good dose of a pesticide.

Another study comes from the Environmental Protection Agency and their 1982 US EPA National Adipose Tissue Survey. In this study, fat biopsies were performed on subjects living in different regions of the US, from New York to California. They found that of those individuals tested, 100% were positive for different chemicals, including styrene, dichlorobenzene, xylene, ethyl phenol, and TCDD (Dioxin). In a follow-up 2003 CDC study, 2500 subjects tested for environmental chemicals across the United States were found to be carrying 116 different pollutants. One of those toxins, trichloroethylene (TCE), was responsible for a leukemia outbreak in Woburn, Massachusetts.  TCE frequently causes paresthesias (tingling and numbness) and [learning disabilities](http://www.psychologytoday.com/conditions/learning-disability). Many of these chemicals have overlapping clinical effects.

Based on this 2003 CDC report and other scientific studies, it is possible that chemicals such as TCE combined with heavy metals such as mercury which affects [memory](http://www.psychologytoday.com/basics/memory) and [concentration](http://www.psychologytoday.com/basics/attention), could be one of the many factors responsible for some of the ADD/ADHD and learning disability epidemics in children and adults in the United States. These chemical compounds could also be an overlapping cofactor causing memory and concentration problems in our [aging](http://www.psychologytoday.com/conditions/aging) population, as well as being responsible for the growing problem with dementia among Alzheimer’s disease patients. Recent environmental studies showed that young adults living in Mexico City who were exposed to high levels of environmental pollutants, and who died from unrelated causes, had early Alzheimer’s changes in their brains on biopsies.  These chemicals can increase inflammation in the brain, leading to early Alzheimer’s type plaques.

Lyme bacteria have also been found in brain biopsies of Alzheimer’s patients in the NIH data bank. Dr. Alan B. MacDonald examined brain biopsies from the McLean Hospital, Harvard University databank from patients with confirmed [Alzheimer's disease](http://www.psychologytoday.com/conditions/alzheimers-disease), and found that by PCR (DNA) analysis, seven out of ten of these patients had the DNA of Borrelia burgdorferi in their brain, the etiologic agent of Lyme disease. We also find that the majority of our chronically ill patients with Lyme disease and co-infections have been exposed to high burdens of heavy metals such as mercury and lead, and occasionally to aluminum.  These heavy metals can cause memory and concentration problems and increase levels of free radicals which can drive inflammation. If we include patients who have undiagnosed B12 deficiency (that are picked up through doing blood tests for B12 and methylmalonic acid levels), and/or patients who suffer from undiagnosed hypothyroidism, we have enough reasons for an epidemic of learning disorders and memory issues/dementia in the general population.

How can we test for these toxins, and what can we do about it? There are several specialty laboratories in the US, like Pacific Toxicology, Metametrix, and Real Time Labs which can check for chemicals such as volatile organic solvents, PCB’s, pesticides and mold neurotoxins. One of the easiest tests to perform to determine if you have been exposed to heavy metals like mercury and lead is called a six-hour urine DMSA challenge, and this can be done through Doctors Data laboratory in Chicago. This test can be done in individuals without a sulfa sensitivity. Heavy metals can accumulate for years in the body, leave the bloodstream where they are no longer measurable there (which is why blood tests are often negative unless there is an acute exposure), and then start compartmentalizing in body tissues. DMSA is an FDA approved chelating agent (Di-mercaptosuccinic acid) which diffuses into and effectively competes with the tissue binding sites for the metals thereby releasing them from sequestered sites. They then will redistribute into the blood as a stable complex, and be eliminated in the urine where they can be measured.

 I have performed this test on thousands of my patients, and found that the vast majority have an elevated body burden of heavy metals such as mercury and lead. Heavy metals have multiple potential deleterious effects on the body including increasing oxidative [stress](http://www.psychologytoday.com/basics/stress) which can damage cell membranes. Damaging the mitochondrial cell membranes, the organelles responsible for the energy production of the cell, could also be the cause of resistant fatigue in some individuals. This seems likely as the scientific literature has shown that a certain percentage of patients with Chronic Fatigue Syndrome improve once damaged mitochondrial cell membranes are repaired using nutritional supplements like glycosylated phospholipids (NT Factors).

Based on the scientific literature which has identified a vast array of chemicals constantly entering our bodies which damage our metabolic machinery, there are six basic functional medicine detoxification principles which need to be a part of every good health plan for those wanting to stay healthy:

•          Minimize Toxic Exposure

•          Ensure Hydration (2-3 liters of water per day)

•          Optimize Bowel Health (probiotics, fiber)

•          Increase [Antioxidant](http://www.psychologytoday.com/basics/antioxidant) Reserves (Vitamin C, alpha lipoic acid)

•          Optimize Mitochondrial Function (NT Factors, CoQ10, acetyl L-carnitine)

•          Assist and Balance Liver Biotransformation of Chemicals and Toxins (magnesium, trace minerals, NAC, Glycine, cruciferous vegetables)

The constant interplay of genetics, environmental load of toxins, infections, [diet](http://www.psychologytoday.com/basics/diet) and nutrition (as well as other factors affecting our detoxification ability), all play a role in causing inflammation, contributing to mental and physical symptoms in susceptible individuals.

We cannot simply name a disease without looking into its multifactorial causes, or we will be leaving a legacy of chronic illnesses for future generations. Epidemics of [autism](http://www.psychologytoday.com/conditions/autism), cancer, strokes, heart attacks, hypertension, diabetes, autoimmune diseases, mental illness, Chronic Fatigue Syndrome/Myalgic encephalomyelitis, Fibromyalgia, and Lyme disease are just some of the ongoing epidemics we now face. This should raise a red flag for everyone, and especially those in charge of our health care policy, as more and more individuals are now getting sick with chronic diseases accounting for 75% of our health care costs. We can do better. Identifying the multifactorial causes of chronic illness is an important paradigm shift that we must make in medicine. The MSIDS model (Multiple Systemic Infectious Disease Syndrome) described in my book “Why Can’t I Get Better? Solving the Mystery of Lyme and Chronic Disease” discusses up to 16 different reasons why individuals remain chronically ill. Identifying and treating chronic infections and detoxifying environmental chemicals are a good place to start.

Dr Richard Horowitz is a board certified internist, and author of the recently released book “Why Can’t I Get Better? Solving the Mystery of Lyme and Chronic Disease”, available through St Martin’s press.

<http://www.amazon.com/Why-Cant-Get-Better-Solving/dp/1250019400>

[www.cangetbetter.com](http://www.cangetbetter.com/)

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