

Lead, the lethal destroyer of the central nervous system and the brain

Lead has been one of the favorite metals of industry for the last 5000 years of recorded history. It's chemically stable, it shapes easily, it doesn't rust, and it can be alloyed with many different metals and adapt to a multitude of uses. Lead has been used in everything from coins, pottery, piping, statues, roofing, paints, and even as a food additive in ancient Rome.

It should not surprise very many of you that lead is toxic. The toxicity of lead is the primary reason that we all use unleaded gasoline in our cars, as well as use non-lead based paints. Because lead is also toxic to wild animals, shotgun shells now make shot pellets out of steel instead of lead. In fact, California has a law that prohibits the use of lead ammunition when hunting in areas where the highly-endangered California condor has its habitat, because as a carrion bird, it will eat dead animals that have been hunted and killed and consume the lead bullets which can be fatal to the bird.

The health of the human population, however, is our primary concern, especially the health of our children. Over thirty years of extensive research on the effects of lead on the human body have many times over shown that lead poses a significantly greater risk to children than adults in terms of damage to the nervous system and cognitive impairment. It has become an indisputable fact that lead poisoning in children is responsible for a large number of learning disorders, delayed speech, lowered IQ, hearing loss, slowed or reduced growth, and with high amounts of exposure the risk increases for seizures, coma and even death.

The Center for Disease Control has compiled national statistics on the incidence of elevated blood lead levels

of children since 1995. The most recent statistics show that in 2007, of the three million children tested, 1% approximately 300,000 children showed blood levels above 10 micrograms per deciliter of blood. A deciliter is a little less than half a cup. While it is encouraging that this number is down from 8% in 1997, there are a number of important factors that aren't being taken into consideration and are one of the reasons why lead poisoning continues to be a health issue for the American population, adults as well as children.

Lead has an extremely high affinity for the nervous system and the brain, which is the reason why so many of the effects that are attributable to lead poisoning are either neurological or psychological in nature. The most common method for assessing lead toxicity is through an analysis of erythrocytes, or blood cells. Lead that is in the blood would indicate recent exposure and would not provide an accurate indication of how long the person has had that level of exposure and how much lead has become entrenched in the nervous system, brain, or other tissues.

Also, the CDC defines "Elevated" amounts of lead in the blood as more than 10micrograms/dL. There is a significant amount of research that has shown that blood levels of less than 10 micrograms can have significant impacts on the cognitive abilities of children, especially IQ. An analysis of pooled data from 7 different prospective studies conducted in four countries by Lanphear BP, Hornung R, Khoury J, et al. showed that between 1 and 30 micrograms IQ scores drop 9.2 points. However, between 1 and 10 micrograms, IQ points drop 6.2 points. Damage is already occurring in children even below the levels that the CDC considers safe. The notion that there is a safe or acceptable exposure level for lead creates a significant problem, especially for children.

The question then becomes, where is lead exposure coming from and why does it affect children so significantly? Lead can be absorbed through the digestive tract, the lungs and topically. The fact the children have a greater tendency to put their dirty hands in their mouth is something just about any inhabitant of this earth can attest to. One of the most commonly advertised sources of lead exposure is in homes that were painted before lead based paints were banned in the mid-1970s. Contact with these home materials, that are either creating dust or flaking, can be potentially consumed, especially by curious and adventurous children.

Even though the United States has taken many significant steps to reduce the overall lead exposure, such regulations have not necessarily been implemented in other countries. There are many countries where quality control of lead exposure is difficult to determine. Intermittently we hear of a factory in China that produced a batch of children's toys that had to be recalled by them because of lead-based paints on the toys. The CDC has issued a public warning about allowing children to consume candy that has been produced in Mexico because of the risk of lead contamination.

These incidences are better regarded as spikes in a very slow constant exposure that even the adult population is currently being subjected to from ground water contamination as a result of run-off from industrial waste and improper consumer disposal. What is not common knowledge is that lead acetate has been approved for use in hair dyes by the FDA since 1980, and the amount of lead acetate in hair dye varies by brand and product type. One study conducted by the Xavier University of Louisiana found several brand of hair dye that contained more than ten times the amount of lead

in house paint. This includes men's hair dye as well.

The FDA, which regulates food products and cosmetics, has set tolerable limits on how much lead is considered "safe". For example, dye and food-coloring agents are only allowed to be added to food products from an FDA approved list. Lipstick, even though there are thousands of colors, if any dyes, or combinations are used, they must be from the approved list. F&C Red #6, for example, can contain up to 20 parts per million (ppm) of lead. The approved lead limit for candy, on the other hand, is 0.1 ppm. The fact that there is an "acceptable" limit for lead contamination should be considered an outrage, but the current justification is that toxic contaminants are an inevitability and that the best that can be done is to simply minimize exposure. What is not being considered is the fact that people tend to use multiple products. Very few women put on only lipstick. Foundation, blush, eyeliner, mascara, shampoo, conditioner, and hair dye are not unfamiliar cosmetics to most women and rate of total cumulative exposure of lead from these products (not to mention other toxins like arsenic, mercury, etc.) is a direct contributor to the long-term bioaccumulation of lead in the entire population.

It is not unlike the era of the Roman Empire. In ancient Rome lead was everywhere. It was used in their plumbing. In fact, the word "plumbing" is derived from the Latin word for lead *plumbum*. Lead was also used as a sweetener in wine and other food recipes. Lead was used as a lining for bathtubs, pots, tanks, ceramics and other containers. It was also used in painting and construction. It was used for connecting segments of stained glass windows, in lining gutters.

Lead was so prevalent in Roman society that many historians now believe that

lead may have been a strong contributor to the ultimate downfall of the Rome. Many symptoms and conditions of lead poisoning were not uncommon even among the elite of Romans. The fact that Julius Caesar both loved wine, and loved women (many, many women) managed to only ever have one child is very likely attributable to the fact that lead poisoning significantly lowers fertility in men as well as increases the risk of birth defects in pregnancy. In fact, Caesar's successor, Augustus was completely sterile, quite likely for the same reasons. Also, perhaps the neurological and psychological effects of lead can perhaps explain the reason why Nero set Rome on fire?

Some of the early symptoms of lead poisoning are: Tremors, abdominal pain, restlessness, anemia, poor memory, anorexia, poor concentration, anxiety, muscle pains, bone pain, malaise, confusion, irritability, constipation, indigestion, depression, impaired coordination, dizziness, hypertension, drowsiness, headaches, and fatigue.

From a genetic standpoint, each person has a different level of resistance to lead poisoning. There is no such person with an "immunity" to lead, but there are some who may require a greater degree of exposure to begin manifesting symptoms than another. It is also true, however, that just as people's resistances vary, so do the expression and severity of symptoms. This is one of the reasons why lead poisoning is often difficult to detect, especially since the symptoms can often be mistaken as separate conditions or attributable to another cause, or worst of all, they go unnoticed or explained as a personality "quirk".

Besides reducing exposure, there are methods of cleansing the body of lead, even if it has become stored intracellularly. Through a process called *chelation*, you can draw out the lead

from within the cells and tissues and bind it to a substance that will escort it out of the body to be excreted through urine. The most effective chelating agent for lead is EDTA. If you really want to know the entire scientific name, Google is your friend.

But in order to know if EDTA is an option for you, or even if you have lead poisoning, it is important to first be properly tested, and not just with a simple blood test. A real lead test requires a priming period using special supplements the encourage the body to release the lead and other heavy metals that have bioaccumulated and flush them out through the urine and conduct an urinalysis on the collection. This is perhaps the most accurate testing method to determine the extent of heavy metal poisoning in the body.

It is critical to be properly tested before beginning a chelation process like EDTA because chelating agents also have a high affinity for other elements that include ones that are essential for health, like calcium and zinc. As with any other health program, it is important to consult with a qualified medical professional who is familiar with your medical history and genetic uniqueness before making any significant changes to your supplement regimen or beginning any new health program.

The fact that lead has become so pervasive in our society is disappointing, but we do not have to follow in the footsteps of the Roman Empire, we can take charge of our lives and we can make the necessary changes to ensure that both ourselves, and our children, can be safe and healthy.



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