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# Thriving on a toxic planet.

Brian Halvorsen




## Definition of Toxicity

- TOXIC, TOXICITY  
Toxic means able to cause harmful health effects. Toxicity is the ability of a substance to cause harmful health effects.
- Capacity of a substance to cause harmful effects on living organisms.




## Heavy Metals

- Lead
- Aluminum
- Mercury
- Arsenic
- Cadmium
- Nickel
- Antimony
- Beryllium
- Platinum
- Thallium
- Thorium
- Tin
- Tungsten
- Uranium




## Mercury Impairs The Immune System.

Mercury molecules inactivate a part of the immune system called Neutrophils. These are responsible for killing fungi inside the body (i.e. blood and soft tissues) that organisms from places like the small intestine. Measuring Neutrophils function is very difficult, since a blood sample must be analyzed several hours after being drawn. Subsequently, very few tests measure this, so how mercury can impair leukocytes, another part of the immune system that fights fungi.

Reference: Title:  
 • Polymorphonuclear phagocytes and killing workers exposed to inorganic mercury.  
 • Fittington RC, Quarter M.  
 • Department of Pharmacology and Hematology, State University of Campinas, Faculty of Medical Sciences, UNICAMP, SP, Brazil.  
 • Int J Immunopharmacol. 1994 Dec; 16(12): 1011-7.

The ability of neutrophils to phagocytose and kill Candida species as well as the splenic phagocytic function was investigated in workers from a mercury producing plant. In the morphological phagocytosis study, two species of Candida were used since its relationship with immunoprotection deficiency susceptibility is linked to HIV/Candida albicans, while Candida pseudotropicalis can be effectively lysed. Phagocytosis of both antigens and splenic phagocytic function were normal in all the workers studied. However, following ingestion of the organism there was considerable reduction in the ability of neutrophils from exposed workers to kill both species of Candida, and this was not explained by a mild impairment of phagocytosis. After improvement in the hygienic conditions in the factory, a new evaluation was performed, 6 months later. In the same workers and urinary mercury concentrations were determined monthly in each worker. Despite a significant reduction in urinary mercury concentration, a greater impairment in the ability of neutrophils to kill C. albicans was observed. The killing of C. pseudotropicalis presented no further impairment when compared to the previous evaluation. These results suggest that impairment of the phagocytic activity of neutrophils from workers with urinary mercury concentrations within the safe level for exposed population is due, at least in part, to some interference with myeloperoxidase activity. In addition, the mercury-NADPH complex, once formed, could limit the utilization of reduced pyridine nucleotides by NADPH-dependent enzymes such as NADPH oxidase, thereby inhibiting the PMN respiratory burst.



## Broken Fluorescent Lamps Containing Mercury.



### Instructions

- 1) Ensure all people and animals leave the room. Open all the windows and doors and shut off heating and air-conditioning systems. Let the room air out for five to 10 minutes. Mercury vapor is released when a fluorescent bulb breaks.
- 2) Put on rubber or latex gloves. Carefully pick up the broken glass and place it onto a paper towel. Fold the paper towel and insert it into a sealable plastic bag.
- 3) Use a wet cloth or paper towel to clean up all visible powder. Use slow sweeping motions to reduce the risk of spreading the mercury. Place the towel into your sealable plastic bag and close the seal.
- 4) Put the plastic bag in a protected area. Contact your local recycling or hazardous waste facility for further information regarding disposal.
- 5) Continue to air out the area where the bulb broke and the leave heating and air conditioning system off for several hours.

A vacuum cleaner should not be used for mercury cleanup. It only atomizes the mercury and makes it more hazardous than before the cleanup.



## Exposure To Metals

Hu H.  
 Prim Care 2000 Dec;27(4):983-96  
 Program of Occupational Health, Department of Environmental Health, Harvard School of Public Health, Boston, MA, USA.  
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Metals, particularly heavy metals such as lead, cadmium, mercury and arsenic, constitute significant potential threats to human health in both occupational and environmental settings. **Mercury exposure is of particular concern because it is neurotoxic, even at the relatively low levels of exposure seen in dentists' offices.** Lead is of concern due to ongoing exposure to thousands of workers in the US and recent research indicating that asymptomatic LEAD exposure can result in chronic toxicity manifestations, such as hypertension, kidney impairment, and cognitive disturbances. Arsenic is clearly carcinogenic, and cadmium is now being recognized as a contributor to osteoporosis. This article reviews these and other issues of concern in the practice of primary care.

### URINE TOXIC METALS

LABORATORY REPORT  
 PATIENT: [REDACTED]  
 MRN: [REDACTED]  
 DATE: [REDACTED]  
 TIME: [REDACTED]

METAL	REFERENCE RANGE	ACTUAL	INTERPRETATION
Aluminum	< 10	15	
Arsenic	< 10	10	
Bismuth	< 100		
Cadmium	< 1.0	1.0	
Copper	< 1.0	1.0	
Lead	< 1.0	1.0	
Mercury	< 1.0	1.0	
Platinum	< 1.0	1.0	
Vanadium	< 1.0	1.0	
Thallium	< 1.0	1.0	
Tin	< 1.0	1.0	
Tungsten	< 1.0	1.0	
Uranium	< 1.0	1.0	



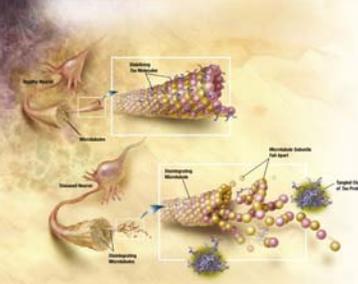
## Sources and Symptoms of Mercury

### Sources (Alphabetical)

- Adhesives
- Air Conditioner Filters
- All Fish - Especially Salmon, Tuna
- Animal & Industrial Waste
- Auto Exhaust
- Batteries
- Cabnets, Body Powders
- Cinabar (Used in Jewelry)
- Cosmetics
- Dental Amalgams
- Drinking & Well Water
- External Solves
- Fabric Softeners
- Fertilizers
- Floor Wax
- Hemorrhoid Supplements
- Latexes
- Paints, Pigments
- Pesticides
- Processed Foods
- Seafood, Seawater
- Skin Lightening Creams
- Thermometers
- Thimerosal, Vaccines
- Wood Preservatives

### Symptoms

- Anxiety
- Appetite Loss
- Chronic Yeast Infections
- Constipation
- Depression
- Dizziness
- Fatigue
- Hallucinations
- Headaches
- Hearing Difficulties
- Highly Emotional
- Hormone Imbalance
- Insomnia
- Irritability
- Kidney Function Impairment
- Loss of Confidence
- Memory Loss
- Muscle Weakness
- Nervousness
- Numb Lips, Feet
- Skin Inflammation
- Speech Disorders
- Sub-Clinical Hypothyroidism
- Tremors
- Weight Loss/Gain

## Chelation

- Chelation can be accomplished with nutrients and/or drugs. In normal health the body uses its enormous glutathione stores to detoxify and remove mercury from the body. NAC (N-acetyl-L-cysteine) is a widely available glutathione precursor that has the ability to directly bind and excrete mercury via its single thiol (sulfur atom) as well as support and increase the body's store of glutathione as a precursor.
- The nutrient ALA (alpha lipoic acid) is a dithiol (with 2 sulfur atoms) compound that is normally used by the body in small amounts as part of the enzymes for producing cellular energy. Because of its two sulfurs, ALA can bind and transport mercury for excretion from the body.

## Nutrition.

Vitamin C  
Chlorella  
Garlic  
Onions  
Apples

## Nutrition.

Cilantro, (Coriander)  
Chlorella  
Mung Beans

## DMPS, DMSA and EDTA

- Most commonly used as mercury chelating agents are DMPS (2,3-dimercapto-1-propane-sulphonic acid) and DMSA (DL-2,3-dimercapto-succinic acid), both are man made dithiol chemicals.
- Another compound used as a chelator is EDTA (Ethylenediaminetetraacetic acid).
- Yet another compound commonly used as an alkalyzing agent is potassium citrate, which also appears able to directly chelate mercury atoms.
- Zeolite, a natural clay based Chelator.

## EDTA Chelation Effects on Urinary Losses of Cadmium, Calcium, Chromium, Cobalt, Copper, Lead, Magnesium, and Zinc

Waters RS, Bryden NA, Patterson KY, Veillon C, Anderson RA  
Biol Trace Elem Res 2001 Dec;83(3):207-21  
Waters Preventive Medical Center Ltd Wisconsin Delta, WI 53965, USA

The efficacy of a chelating agent in binding a given metal in a biological system depends on the binding constants of the chelator for the particular metals in the system, the concentration of the metals, and the presence and concentrations of other ligands competing for the metals in question. In this study, we make a comparison of the in vitro binding constants for the chelator, ethylenediaminetetraacetic acid, with the quantitative urinary excretion of the metals measured before and after EDTA infusion in 16 patients. There were significant increases in lead, zinc, cadmium, and calcium, and these increases roughly corresponded to the expected relative increases predicted by the EDTA-metal-binding constants as measured in vitro. There were no significant increases in urinary cobalt, chromium, or copper as a result of EDTA infusion. The actual increase in cobalt could be entirely attributed to the cobalt content of the cyanocobalamin that was added to the infusion. Although copper did increase in the post-EDTA specimens, the increase was not statistically significant. In the case of magnesium, there was a net retention of approximately 85% following chelation.

This data demonstrates that EDTA chelation therapy results in significantly increased urinary losses of lead, zinc, cadmium, and calcium following EDTA chelation therapy. There were no significant changes in cobalt, chromium, or copper and a retention of magnesium. These effects are likely to have significant effects on nutrient concentrations and interactions and partially explain the clinical improvements seen in patients undergoing EDTA chelation therapy.

## Fibre in Diet

- Chelator circulates in the blood locking up heavy metals.
- Liver pulls out the bound metals.
- Liver rejects bound metals into the stomach with bile.
- If no non-soluble fibre to absorb and carry out of the body- the lower intestines reabsorb the bound metals and they recirculate.
- So fibre in the diet is essential.

## Life Extension in the Rotifer *Mytilina brevispina* Var *Redunca* by the Application of Chelating Agents.

Andrew M Sincocck PhD

Observations on the survival times of individuals exposed by brief immersion on alternate days of adult life to one of the following chelating agents - EGTA, EDTA, sodium tartrate and sodium citrate, revealed significant life extension in all cases

Ethylenediaminetetraacetic acid (EDTA) chelates a metal ion

## The Scientific Basis of EDTA Chelation Therapy

By Bruce Halstead MD

EDTA chelation has been found to be effective in lowering serum calcium, cholesterol, and heavy metals by the oral route (Foreman, Vier, and Magee, 1953; Bradley and Powell, 1954; Mariani and Bisetti, 1955; Schroeder, 1956; Mariani and Bisetti, 1957; Mariani et al., 1957; Color, 1958; Roxburgh and Haas, 1959; Baretolosi and Zarlo, 1960; Rubin, 1961; Belknap, 1961; Foreman, 1961; Elix et al., 1967; Thomas and Ashton, 1991; Turfot et al., 1962; and Rabau et al., 1991). According to Foreman, Vier, and Magee (1953), when EDTA was administered by the oral route it raised the absorption level was about 18% effective compared to 95% by the intravenous route. A time-release EDTA anal suppository has recently been patented which has the advantage over the oral route because of time release and possible higher absorption levels. The anal suppository was designed for use in the treatment of lead poisoning in small children. Numerous so-called oral chelating products have appeared on the market, but most of them have been poorly formulated and usually contain metallic elements that have the potential of complexing with the EDTA in the product. If the objective of the chelating agent is to remove calcium ion, which is a divalent element having a low coordination number, stability, and avidity, then metals having a greater coordination number, stability, and avidity than calcium should not be there.

*Bioinorganic Chemical Properties of EDTA*

In EDTA, a metal ion, two oxygen atoms and two nitrogen atoms comprise a square

stable  
#65

**THE SCIENTIFIC BASIS OF EDTA CHELATION THERAPY**  
Second Edition

Mortality from cancer was reduced by 90% during an 18-year study of 59 patients treated with Calcium-EDTA.



**THANK YOU**  
Thriving on a toxic planet.  
Brian Halvorsen

A photograph of a smiling man and woman standing outdoors in a park-like setting with trees and a building in the background. A vertical strip on the left side of the slide features a key and the word 'science' written vertically.