



# MCS America

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# MCSA NEWS

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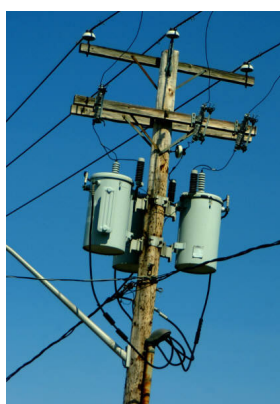
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## The PCB In Me

Polychlorinated biphenyls (PCBs) are mixtures of up to 209 individual chlorinated compounds (known as congeners) and refer to a class of chlorinated, chemical compounds that includes numerous different substances favored for their low conductivity, high boiling point, chemical stability, and flame retardant properties. "There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor."<sup>2</sup> Monsanto Company, the sole manufacturer of PCBs in the United States from 1929-1977, produced over 700,000 tons of PCBs.<sup>1</sup> PCB's were often used for insulating and cooling electrical equipment, particularly in transformers, large capacitors, and fluorescent lamp ballasts due to their low flammability.<sup>1</sup>



sources.<sup>1</sup> PCB's, now mostly banned were previously used in the production of dielectric fluids for transformers, capacitors, and other electrical components as well as synthetic resins, epoxy paints, protective coatings, and hydraulic and heat transfer fluids.<sup>1</sup>

A group of persistent and widely distributed environmental pollutants, PCB's are known to cause neurotoxic effects, endocrine disruption, cancer, and reproductive abnormalities. Individuals may suffer exposure through the use old fluorescent lighting fixtures, electrical devices, and appliances that were made at least 30 years ago. Food borne exposure is common when eating fish, especially sport fish caught in contaminated lakes or rivers, as well as some meats and dairy products.<sup>2</sup> Other sources of exposure include hazardous waste sites, contaminated well water, and workplace exposure during repair and maintenance of PCB transformers, fluorescent lights, and other old electrical devices.<sup>2</sup> An example of a common source of non-occupational exposure is a leaking power transformer on an electrical pole on a residential street. Symptoms of PCB exposure include skin conditions such as acne and rashes,

**“PCBs are resistant to metabolism and can accumulate and biomagnify.”**

stomach problems, thyroid gland injuries, cancer, changes in the immune system, behavioral alterations, impaired reproduction, liver damage, and death.<sup>2</sup> Laboratory tests can determine levels of PCB in blood, body fat, and breast milk.<sup>2</sup> However, like many tests for toxicants, it is rarely ordered by physicians and no specific limits are set for cases of poisoning.

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L).<sup>2</sup> Infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat may contain no more than 0.2-3 parts of PCBs per million parts.<sup>2</sup> However, it is conceivable that no amount may be safe. Each little bit adds to the overall environmental and body burden. Since PCBs are a persistent pollutant, each little bit adds to the bits before for an ever increasing PCB burden.

PCBs are recognized as persistent environmental pollutants, which are

resistant to degradation and can be found in surface soil. They accumulate in animal tissues and have been known to interfere with reproductive processes. This accumulation has been found in many human tissues, including follicular fluid, uterus, placenta and ovarian/uterine cells. In addition, PCB's have been shown to bioaccumulate in rivers and seas, as well as detritivorous fish and bluefin tuna. Fish intake was associated with elevated PCB

levels in pregnant women from Taiwan.<sup>14</sup> A study showed concentrations of PCBs were significantly higher in otters that died of infectious disease, suggesting an association between elevated PCB concentrations and infectious diseases.<sup>15</sup>

Since PCB's present no odor, determining if there is a clear and present danger can be difficult. Testing is required to determine exposure.

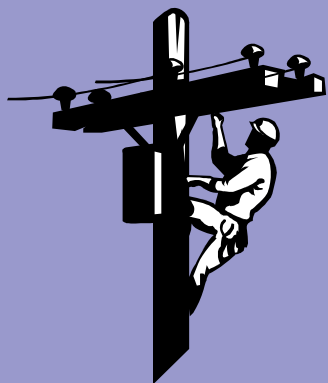
PCBs are resistant to metabolism and can accumulate and biomagnify.<sup>16</sup> PCB's are easily stored in body fat and losing weight may mobilize PCB's and other toxicants, causing illness. “The pharmacokinetic behavior of dioxinlike compounds and PCBs is largely governed by three major factors: 1) lipophilicity, 2) binding to CYP1A2 leading to hepatic sequestration, and 3) relative rates of metabolism. v controls the rate and extent of absorption, tissue distribution, and passive elimination.”<sup>16</sup>

Therefore, the main detoxifying mechanism for PCB's is to convert this fat-soluble substance into a water-soluble substance for ease of excretion. Sauna therapy may be helpful as the sauna heats body fat, which may mobilize PCB's into the blood stream where they can be then be excreted. Adequate nutrition and supplementation may also play a key roll to ensure the liver detoxification system is supported and properly functioning. And, as always, avoiding exposure in the first place is the best measure!

-LS



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