

The Mid-Atlantic Center for Children's Health & the Environment

A Pediatric Environmental Health Specialty Unit

Affiliated with the George Washington University School of Public Health & Health Services
and the
Children's National Medical Center

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**Testimony of
Jerome A. Paulson, MD
before the City Council of Washington DC
on the matter of Lead in Drinking Water
10 February 2004.**

Councilmember Schwartz and other members of the Washington, DC City Council. Thank you for the opportunity to present this testimony today. I am Dr. Jerome A. Paulson. I am a pediatrician and one of the Co-Directors of the Mid-Atlantic Center for Children's Health & the Environment. We are one of eleven Pediatric Environmental Health Specialty Units in the US and we are based at the George Washington University School of Public Health and Children's National Medical Center. I am the Medical Advisor for the Children's Environmental Health Network. I also practice primary care pediatrics here in the District of Columbia.

The Mid-Atlantic Center for Children's Health and the Environment, which serves the District of Columbia and the five states in the Mid-Atlantic region, has two goals: 1) the education of health professionals and others about the scientific and medical aspects of environmental health problems effecting children, and 2) providing advice to physicians, nurses, public health officials, parents, school professionals and others about children who have been, or may have been, exposed to environmental health hazards.

The Children's Environmental Health Network is a national multi-disciplinary, non-profit organization, based in Washington, DC whose mission is to protect the fetus and the child from environmental health hazards and promote a healthy environment.

In my testimony last week, I focused primarily on the toxicity of lead to children and provided a set of recommendations for the evaluation of children who might have been exposed to excess levels of lead via the drinking water. This week, I will focus primarily on issues related to adults.

Lead Toxicity

People are exposed to lead through ingestion or inhalation of lead contaminated food, water, or air. When lead enters the body, either via the lungs or the gastrointestinal tract, it moves into the blood stream. Because it is chemically similar to the ubiquitous chemical calcium, it replaces calcium in various bodily processes. Lead then exerts its toxic effects by inactivating crucial enzymes and so halting biochemical pathways essential to normal functioning. The enzymes most sensitive to the effects of lead are in the organ system where we most commonly see symptoms of lead poisoning: the brain. Other organ systems are also at risk from lead toxicity due to enzyme inhibition and impaired iron uptake and processing. These systems include the kidneys, the auditory system, the reproductive system, and red blood cell production.

Adults absorb less of the lead that they ingest through the stomach and intestines than do children.¹ This is one of the reasons that lead is less hazardous to adults when an equivalent amount has been swallowed. Also, pound for pound, adults drink less water than children do. Therefore, they are exposed to a smaller amount of the contaminant per pound of body weight.²

¹ Children 0-2 years absorb about 50% of the lead they ingest. Children 2-6 years absorb about 35% of the lead they ingest. Children 6-7 years absorb about 20% of the lead they ingest. Adults absorb about 10% of the lead they ingest.

² For example, when an infant drinks six ounces of formula or breast milk per kilogram of body weight daily, it is equivalent to an adult male drinking 35 cans of soda in a day.

There is a lot of medical information about exposure to lead in occupational settings. However, it should be recognized that the goal in an occupational environment, set by the Occupational Safety and Health Administration, is to keep a worker's blood lead level below 50 mcg/dL. Therefore, data from workers may not translate to exposures in the non-occupational setting and the problems in workers may not reflect the problems of those with lower exposures.

“There is currently considerable scientific debate as to whether there is a causal relationship between lead exposure and hypertension. Another area of controversy is whether African Americans are more susceptible to the cardiovascular effects of lead than are whites or Hispanics. The evidence from both occupational studies and large-scale general population studies (i.e., National Health and Nutrition Examination Survey [NHANES II], British Regional Heart Study [BRHS]) is not sufficient to conclude that such a causal relationship exists between PbB levels and increases in blood pressure.”ⁱ

Young adults from the general population who had blood lead levels up to 40 mcg/dl were more likely to have decreased kidney function as they aged than were comparable individuals with blood leads of 10 mcg/dL.ⁱⁱ

Low levels of lead may contribute to impairments in cognitive function in senior citizens, at least in men.ⁱⁱⁱ

In a review of the literature regarding lead levels in pregnant woman, the author indicates that women with elevated, but low (approximately 9 mcg/dL), blood lead level have a relatively good prognosis for the pregnancy and the infant. “Most studies have found no statistically significant differences in mean concentration of lead in cord blood between women with complications such as premature rupture of membranes, preterm delivery, preeclampsia, or meconium staining and women who did not suffer these complications. Additionally, no association between lead levels and breech presentation, placenta previa, abruptio placentae, fetal distress, or low Apgar scores has been elucidated. Only one study showed a statistically significant increase in preterm delivery of babies with cord blood lead levels averaging approximately 10 µg/dl. In summary, the majority of studies that investigated adverse obstetrical outcome and elevated but relatively low lead levels revealed no statistically significant relationship between lead and obstetrical outcome.”^{iv}

Recommendations for managing medical aspects of the problems of lead-contaminated drinking water in the District of Columbia

See the Appendix for a summary of recommendations regarding the medical response to lead-contaminated water in the District of Columbia.

Lead Poisoning in the District of Columbia

I realize that this is a hearing about lead contamination of drinking water in the District of Columbia. However, I cannot let this opportunity go by without reminding the members of the Council that there are thousands of homes in the District of Columbia that contain lead-based

paint. As a result, there are hundreds of children every year in the District of Columbia who sustain brain damage as a result of exposure to this paint.

At the present time we have an inadequate law in the District of Columbia that requires screening of children from 6-9 months of age and again in the second year of life. Screening at 6-9 months is too early to identify children with elevated lead levels.

Moreover, and more importantly, screening children means that we are using children to identify unsafe homes in the District of Columbia. Since there is no known safe level of lead, identifying children with elevated lead levels means identifying children after the damage may have been done.

The District of Columbia needs to work to identify and repair, or have repaired, dwellings that are unsafe for children before the children are harmed. There are ways to do this. The federal government will predicate its future funding for lead programs on this type of approach.

The District needs to change its current law and stop the unethical process of using children to identify unsafe housing. The City Council should convene hearings in the near future to review the entire issue of lead poisoning in the District of Columbia. Major changes need to be made in the way the District and the private sector operate so that children are protected from a problem which is preventable and about which children and their parents have very little control. Council members need to be aggressive and forceful leaders on this issue.

**Appendix to the testimony of Jerome A. Paulson, MD before the City Council of
Washington DC on the matter of Lead in Drinking Water, 10 February 2004.**

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LEAD IN WATER IN THE DISTRICT OF COLUMBIA

This is our understanding of the current situation regarding lead in water in the District of Columbia. There are about 130,000 homes in Washington that get their water from the Water and Sewer Authority (WASA). About 23,000 of those homes have lead pipes that connect the home to the water main in the street. Only those homes are at risk of having lead in their water.

We recommend the following:

1. Contact WASA ((202) 787-2732 or WQP2003@dcwasa.com) to determine if you have a lead service line. If you do not, you need not worry further.
2. If you have a lead service line, WASA can provide you with a kit to collect your water to determine if it contains amounts of lead that might be hazardous. These kits are also available on-line and in some home stores. Look for a kit provided by a company that uses an EPA-certified laboratory. A list of EPA Certified laboratories is available at <http://www.dhmd.state.md.us/labs/pdf/watercert/certlist-11-30-2003.PDF> or <http://www.vdh.state.va.us/dw/files/lablist.pdf>
3. If the level of lead in your water is below 15 parts per billion, there is very little likelihood of a problem developing from drinking the water.
4. We would only advise blood lead tests for children under 6, and only under the following circumstances
 - a. If the level of lead in your water is over 100 parts per billion, and you live in a house built before 1950, and your child has a developmental or neurological problem; or
 - b. If the level of lead in your water is over 300 parts per billion
5. If you are in one of these situations, please call the office to schedule an appointment for a lead test.
6. Do not use tap water to make infant formula until you know that you do not have a lead service line or you know that the amount of lead in your water is less than 15 parts per billion.
7. Pregnant women and breast feeding mothers should not drink the tap water until they know that they do not have a lead service line or that the water at their tap is less than 15 parts per billion
7. If the level of lead in your water is above 15 parts per billion, do not drink the water unless it has been filtered through a filter that is certified to remove lead by NSF International. (www.nsfconsumer.org/water/drinking_water.asp) Additional information about water filters was printed in the January 2003 edition of *Consumers Reports*.
8. Additional information about lead in water is available at the Mid-Atlantic Center for Children's Health and the Environment. They can be reached at 202-994-1166 or their web site www.health-e-kids.org

References

- ⁱ Agency for Toxic Substances & Disease Registry (ATSDR). Toxicological Profile on Lead. <http://www.atsdr.cdc.gov/toxprofiles/tp13.html> (Accessed 9 February 2004)
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- ^{iv} Gardella C. Lead exposure in pregnancy: a review of the literature and argument for routine prenatal screening. Obstetrical & Gynecological Survey. 2001; 56:231-238