



***Illegal and Unhealthy:  
Lead in California Jewelry***



CEH

center for environmental health

2201 Broadway, Suite 302  
Oakland, CA 94612

T: (510) 655-3900

F: (510) 655-9100

[www.ceh.org](http://www.ceh.org)

December, 2008

This report was written by Caroline Cox, research director at the Center for Environmental Health.

# Introduction

In 2006, the Center for Environmental Health signed legal agreements with major jewelry distributors and retailers that set strict limits on the amount of lead in jewelry sold in California. The same limits are part of a California law that took effect last March.

In collaboration with the California Attorney General the Center for Environmental Health has been monitoring compliance with the jewelry law since last September. This report describes our findings so far.

Lead is a stunningly toxic metal. A long list of problems has been linked to lead exposure: lowered intelligence, behavior problems, cancer, strokes, high blood pressure, kidney problems, anemia, cavities, and delayed puberty.




It is well known that children are particularly susceptible to the effects of lead, but lead's effects on adults are also of concern. It's especially alarming that exposure to lead during pregnancy can reduce the later intellectual development of a woman's unborn child.

# New Limits for Lead in Jewelry

During the last decade lead was a common ingredient in jewelry. Alloys used to cast metal components were often over 50 percent lead. Lead was also used in vinyl jewelry components (such as cords) as well as the shiny surface coatings on imitation pearls. Jewelry sold in California must now meet strict limits for lead content. Most components of children's jewelry cannot contain more than 600 parts per million lead. Metal components of adult jewelry cannot contain more than 15,000 parts per million lead (100,000 parts per million if the component is electroplated). Plastic components must meet the 600 parts per million standard.

# Lead in Jewelry

Examples of jewelry purchased since September with lead content that violates California law

	<b>Abercrombie and Fitch</b>		<b>Lane Bryant</b>
	<b>Anchor Blue</b>		<b>Long's (CVS)</b>
	<b>Express</b>		<b>Wal-Mart</b>

# Not Good for Children

Lead has a profound ability to damage children's intellectual and behavioral development. Children who have been exposed to higher levels of lead score lower on IQ tests than children with less exposure. Children with higher exposures are also more impulsive and have shorter attention spans.

Recent research has documented that lead exposure causes significant problems for children as they grow and develop:

- Scientists at Duke University found that increased blood lead levels in toddlers (1 to 2 years old) were linked with lower test scores in fourth grade.
- A 2007 study led by a scientist at the Harvard School of Public Health found that lead exposure in children ages 5 to 10 was linked with lower scores on IQ tests, lower scores on standardized reading and math achievement tests, decreased attention, and memory problems.
- Recent research looked at children and teens ages 4 to 15 who participated in a national monitoring program at the Center for Disease Control and Prevention. The study showed that lead exposure may be responsible for Attention Deficit Hyperactivity Disorder (ADHD) in almost 300,000 children.
- University of Cincinnati researchers found that arrest rates of young adults (both for violent crimes and all arrests) were linked to the blood lead levels of these adults when they were children. Higher childhood lead exposure was associated with higher arrest rates.

# Not Good for Pregnant Women

Two recent studies highlight the impacts that lead exposure during pregnancy can have on a women's unborn child. Because jewelry is often worn by women of childbearing age, lead in jewelry can have serious consequences.

Both of the studies were published in the National Institute of Environmental Health Sciences's journal *Environmental Health Perspectives*.

The first study looked at IQ scores of children ages 6 to 10 in relationship to their mother's blood lead levels during pregnancy. The researchers concluded that "Lead exposure around 28 weeks gestation is a critical period for later child intellectual development, with lasting and possibly permanent effects. There was no evidence of a threshold; the strongest lead effects on IQ occurred within the first few micrograms of BPb [blood lead level]."

The second study looked at mental development of two-year-olds, again in relationship to lead exposure of their mothers during pregnancy. The researchers found that lead exposure during the first trimester (three month period), when some women are not even aware that they are pregnant, had the most pronounced effects.

Because of these kinds of problems, the state of California has identified lead as a chemical that causes developmental toxicity.

# Not Good for Other Adults Either

Lead also causes a wide spectrum of health problems in adults.

One significant disease caused by lead exposure is cancer. The International Agency for Research on Cancer, the U.S. Environmental Protection Agency, and the National Toxicology Program, have all identified lead as a cancer causing chemical.

Lead also reduces our ability to have healthy children. Two recent studies, one from the Taiwan Institute of Occupational Safety and Health and the other from Brown Medical School, showed that women with higher lead exposures were more likely to have infertility problems.

Other important diseases are also linked to lead exposure. Researchers from Tulane University and Johns Hopkins University recently showed that low level lead exposures are linked to a greater risk of heart attacks and strokes. Other recent studies showed that lead exposure increases blood pressure problems, accelerates kidney failure in patients with chronic kidney disease and is linked to an increased risk of Lou Gehrig's disease.



# What You Can Do

If you own jewelry that may contain lead, you can use an inexpensive test kit to check your jewelry. The test kits are available at most hardware and paint stores.

Don't purchase the lead-containing jewelry identified in this report.

Don't buy jewelry with metal or vinyl components for children.

If you shop regularly at Express, Lane Bryant, Anchor Blue, or Wal-Mart ask your store manager what steps the store is taking to make sure that it complies with California's lead in jewelry law.

Buy locally made jewelry at craft and holiday fairs.

# References

## Introduction

U.S. Department of Health and Human Services. Public Health Service. Agency for Toxic Substances and Disease Registry. 2005. Draft toxicological profile for lead. <http://www.atsdr.cdc.gov/toxprofiles/tp13.html>. Pp. 9-30.

## New Limits for Lead in Jewelry

California Health and Safety Code Section 25214.1-25214.4.2

## Not Good For Kids

U.S. Department of Health and Human Services. Public Health Service. Agency for Toxic Substances and Disease Registry. 2005. Draft toxicological profile for lead. <http://www.atsdr.cdc.gov/toxprofiles/tp13.html>. p.23.

M.L. Miranda et al. 2007. The relationship between early childhood blood lead levels and performance on end-of-grade tests. *Environ. Health Perspect.* 115:1242-1247.

P. J. Surkan et al. 2007. Neuropsychological function in children with blood lead levels <10 mg/dL. *NeuroToxicology* 28 (2007) 1170–1177.

Joe M. Braun et al. 2006. Exposures to environmental toxicants and Attention Deficit Hyperactivity Disorder in U.S. children. *Environ. Health Perspect.* 114:1904–1909.

John Paul Wright et al. 2008. Association of prenatal and childhood blood lead concentrations with criminal arrests in early adulthood. *PLoS Medicine* 5(5): 732-740.

## Not Good For Pregnant Women

Lourdes Schnaas et al. 2005. Reduced Intellectual Development in Children with Prenatal Lead Exposure. *Environ. Health Perspect.* 114:791–797.

Howard Hu et al. 2006. Fetal lead exposure at each stage of pregnancy as a predictor of infant mental development. *Environ. Health Perspect.*:114:1730–1735.

## Not Good For Other Adults Either

U.S. Department of Health and Human Services. Public Health Service. Agency for Toxic Substances and Disease Registry. 2005. Draft toxicological profile for lead. <http://www.atsdr.cdc.gov/toxprofiles/tp13.html>. Pp. 378-380.

Shu-Hao Chang et al. 2006. Low blood lead concentration in association with infertility in women. *Environmental Research* 101: 380–386.

Tali Silberstein et al. 2006. Lead concentrates in ovarian follicle compromises pregnancy. *Journal of Trace Elements in Medicine and Biology* 20: 205–207.

Andy Menke et al. 2006. Blood lead below 0.48  $\mu\text{mol/L}$  (10  $\mu\text{g/dL}$ ) and mortality among US adults. *Circulation* 114: 1388-1394.

T. Perlstein et al. 2007. Cumulative community-level lead exposure and pulse pressure: The normative aging study. *Environ. Health Perspect.* 115:1696–1700.

Ja-Liang Lin et al. 2006. Low-level environmental exposure to lead and progressive chronic kidney diseases. *The American Journal of Medicine* 119: 707e1-707.e9.

F. Kamel et al. 2005. Lead exposure as a risk factor for amyotrophic lateral sclerosis. *Neurodegenerative Dis.* 2:195–201.