

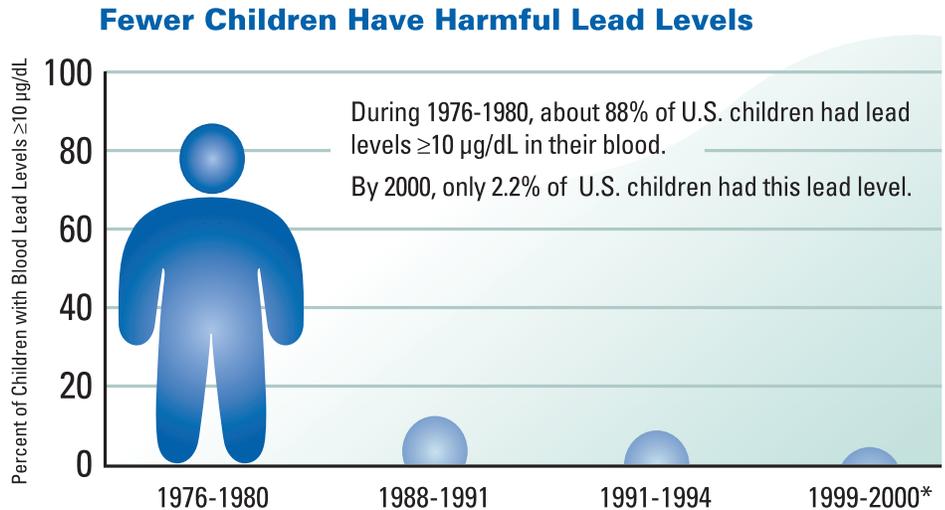
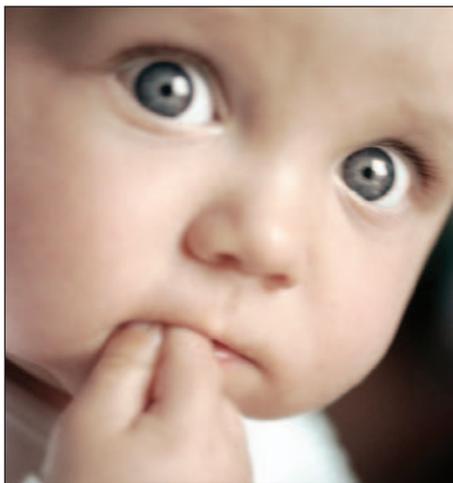
Lead and Your Health

Lead poisoning in American children has decreased by about 86% since the late 1970s! Much of this success is due to research supported by the National Institute of Environmental Health Sciences (NIEHS) and others which helped to identify and reduce the health effects of lead poisoning in children and adults.

NIEHS supports research that looks at the effects of lead in children, especially how it impacts their ability to learn. NIEHS is also developing ways to more effectively prevent and treat lead poisoning.

Who is most Vulnerable to the Effects of Lead?

Children are more sensitive than adults to the effects of lead. Young children under the age of five are particularly vulnerable for a variety of reasons, including the fact that their body and brain are still developing. Two year-olds tend to have the highest blood level concentration because they put many things into their



Source: National Health and Nutrition Examination Surveys (NHANES) for children 1-5 years old.
*Data for 1999-2000 are variable, relative standard error >30%.

mouth, including toys or other products that may become lead contaminated. Blood tests are used to measure the concentrations or amount of lead in your blood and are commonly used to detect lead poisoning in children. Although long-standing National surveys, such as the National Health and Nutrition Examination Survey, show that lead levels have decreased in all children, black children and poor children continue to have higher levels of lead detectable in their blood.²

What are the Effects of Lead in Children?

Lead poisoning has been linked to lower IQ scores in children exposed to even low levels of lead.

What are the Health Effects of Lead in Adults?

Lead can increase blood pressure and cause fertility problems, nerve disorders, muscle and joint

pain, irritability, and memory or concentration problems. It takes a significantly greater level of exposure to lead for adults than it does for kids to sustain adverse health effects. Most adults who are lead poisoned get exposed to lead at work. Occupations related to welding, renovation and remodeling activities, smelters, firing ranges, the manufacture and disposal of car batteries, and the maintenance and repair of bridges and water towers, are particularly at risk for lead exposure.

As a general rule, the more lead you have in your body, the more likely it is that you'll have health problems. Because the effects of lead are different for everyone, more research needs to be done to fully understand the health effects.

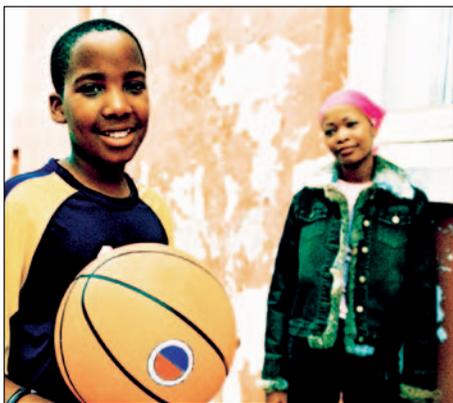
A 2004 study supported by NIEHS also showed that lifetime lead exposure may increase the risk



of developing cataracts.³ Cataracts is a clouding of the lens resulting in a partial loss of vision, which can be common in older people.

What is Lead?

Lead is a soft, highly toxic metal. It occurs naturally in the earth, but is spread through the environment by human activities. For many years it was used in products found in and around homes, including paint and gasoline.



Where is Lead Found?

Some of the places where lead may be found are in lead-based paint, contaminated soil, household dust, drinking water, lead crystal, lead-glazed pottery, and some inexpensive metal jewelry. Until 1978, lead paint was commonly used on the interiors and exteriors of our homes. Deteriorated lead paint in older housing remains the most common source of lead exposure for children in the United States.

How Does Lead Get into the Body?

Lead can get into your body in two ways: through breathing it in or by eating it. For example, lead from paint can enter your body through eating or inhaling dust or paint chips. The soil around your home can pick up lead from sources such as exterior paint. Lead can also enter your drinking water through your plumbing.

How Much Lead is Harmful?

Blood lead levels (BLL) in children found to be over 10 micrograms per deciliter, or 10 $\mu\text{g}/\text{dL}$, are reason for concern. A microgram is one millionth of a gram. A deciliter is about half a cup of liquid. Children with concentrations less than 10 $\mu\text{g}/\text{dL}$ are not currently considered to have excess lead exposure. However, some recent studies suggest that adverse health effects exist in children at blood lead levels less than 10 $\mu\text{g}/\text{dL}$. For example, a 2003 study that NIEHS supported found that blood lead concentrations lower than 10 micrograms per deciliter can impair a child's ability to learn and result in lower IQ scores.⁴

Are there Treatments to Remove Lead from the Body?

Yes, medications exist that can rid lead from the body. Medications such as Succimer have been shown to significantly reduce lead in children with very high blood lead levels, that is between 20 to 44 $\mu\text{g}/\text{dL}$.⁵ Although Succimer lowered blood lead about 25% in the short term, it did not improve IQ or other test scores. This reinforces the need for prevention. Treatment after the fact does not undo the damage caused by lead. Children must be protected from being exposed in the first place.

Prevention is our best course of action against lead poisoning.

How Can I protect My Family from being Exposed to Lead?

Prevention is the best way to stop lead poisoning. You and your health care provider are in an excellent position to prevent and detect lead poisoning. The source of most lead poisoning in children now is dust and chips from deteriorating lead paint on interior surfaces. Try to keep young children from eating any paint chips or objects that may be

contaminated by lead, especially if your home was built before 1978. Also, if you live in an older home, you should check with your local health department about any lead that may be in the tap water you use for drinking and cooking. There is increasing evidence that professional cleaning; painting over old paint to stabilize it, and removal of hazardous building components, like old pipes, can stop lead exposure. All of these should be done by trained professionals.

What Role Has the Government Played in Reducing Lead Poisoning?

Since 1980 there has been a significant decrease in exposure to airborne lead in the United States. Research by NIEHS and others has shown the harmful effects that lead can have on human health. Federal and state regulatory standards and programs have helped to minimize or eliminate the amount of lead in consumer products, occupational settings, and the environment. Federal legislation in the 1970s removed lead from gasoline and decreased smokestack emissions.



For more information on lead and other environmental factors that impact health, go to our website at: www.niehs.nih.gov.

¹ Centers for Disease Control and Prevention. *Surveillance for Elevated Blood Lead Levels Among Children—United States, 1997-2001*. *MMWR Surveillance Summaries*, 2003; 52:1-21.

² *Environ Health Perspect*, 1998 Nov; 106(11):745-50.

³ *JAMA*. 2004;292:2750-2754.

⁴ *New England Journal of Medicine*, April 17, 2003; 348:1517-1526.

⁵ *Pediatrics* 2004; 114; 19-26.