

# Reducing Exposure to Lead

*A TOSC Fact Sheet*

## What Health Concerns are Associated with Lead Exposure?

Lead exposure is one of the most serious health concerns in the United States today. Lead levels considered safe 20 years ago are now recognized to cause "subclinical poisoning" that affects red blood cells, kidneys, bones, reproductive organs, and the nervous system. All effects may occur without overt physical symptoms.



Of particular concern are lead exposures in children and pregnant women. Blood lead levels as low as 10-15 micrograms/deciliter (ug/dl), both before and after birth, are related to delayed mental development, lower IQ, hearing deficits, speech and language handicaps, and poor attention span in children.

Each year in the US, an estimated 3-4 million children under 6 years of age have blood lead levels over 15 ug/dl, and an estimated 400,000 fetuses are exposed to lead at levels that can effect their mental development. The problem cuts across all socioeconomic boundaries, making lead exposure one of the nation's major health concerns.

Because children can be exposed to lead from many sources and because of the possible effects at very low levels on fetal and child development, the following measures are recommended to prevent lead poisoning.

- ◆ All children be screened for lead as part of routine pediatric care.
- ◆ Physicians use a blood lead test for screening for women of reproductive stage.
- ◆ Children with high blood lead levels need follow-up that can range from education and nutritional counseling to environmental interventions to pharmacological therapy.

## How might I be exposed to lead?



**Lead Paint** Deteriorating lead paint is usually the primary cause of childhood lead poisoning. Until the 1950s, people typically covered barns, bridges, buildings, and houses—inside and out—with lead-based paint. Lead paints began to fall into disfavor in the early 1950s, and their use in housing was banned after 1977. But because much of the nation's housing pre-dates the 1950s, deteriorating lead paint can cause extremely high lead exposures. In older, poorly maintained houses, dust and chips from deteriorating lead paint can fall into window wells, rooms, and into the soil at the base of the houses. In older houses undergoing repair or renovation, lead-

### Basic facts about lead

- Lead and its compounds can be found in all parts of the environment.
- Lead in air can be carried long distances from where it is released.
- Lead in the air attaches to dust.
- Lead-containing dust is removed from the air by rain.
- Lead stays in soil for many years.



contaminated dust can expose anyone in the vicinity. Even in well-maintained homes, contaminated dust from paint and soil can be a source of lead.

**Leaded Gasoline** The use of leaded gasoline peaked in the 1970s and contributed to widespread lead exposure both in air and soil. The heaviest concentrations of airborne lead were near busy roadways. While the use of leaded gasoline has dropped significantly since 1980, dust and soil near major roads can still contain high levels of lead from auto exhaust.

**Contaminated Dust & Soil** Dust tracked in from outdoors where the soil contains lead can be a major source of exposure for small children. Soil can become contaminated by lead from paint, auto exhaust, smelter emissions, or other industrial activities. Parents may also carry lead dust home on their clothing if they are exposed to lead at work.

**Contaminated Drinking Water** Lead leached from lead pipes and solder can appear in drinking water. Because plumbing installed before 1940 is likely to contain lead, lead-contaminated drinking water is often a problem in old houses. In newer houses, lead from solder can leach into water for about five years after installation; even brass faucets contain 3-8 percent lead. Thus, while federal regulations passed in 1986 prohibit using lead solder in drinking water pipes, lead sources in newer plumbing can still present a problem. Lead solder in older commercial coffee urns and lead solder or liners in water coolers in schools and public buildings can also be sources of lead exposure.

**Lead in Foods** In foods, lead can enter foodstuffs as they grow, or when they're processed and packaged. Acidic foods can leach lead from lead solder in cans and from lead glazes on pottery and ceramic ware. Dust present on unwashed fruits and vegetables can be a source of lead exposure.

**Lead in Folk Remedies** A variety of folk remedies may contain lead: Mexican-Americans, for example, may treat gastrointestinal ailments with azarcon (lead tetroxide) or greta (lead monoxide); Laotians may use another lead-based compounds known as "pay-loo-ah."

**Other Sources** Other sources of lead include colored newsprint, such hobbies as stained glass and ceramics, and even target practice in poorly ventilated indoor firing ranges.

### How Does Lead Enter the Body?

People absorb lead both through ingestion (eating it) and inhalation (breathing it in). Once absorbed, lead enters the blood stream, soft body tissues (such as kidney, liver, brain, and bone marrow), and hard tissues,



such as bone and teeth.

***Special Concerns in Children*** For children, ingestion (eating) is the usual route of exposure, and they can absorb as much as 50 percent of the lead they ingest. Absorption increases with fasting, and with iron and calcium deficiency.

### **What Happens to Lead that Enters the Body?**

Most of the lead in the body is found in the hard tissues, particularly in the bones, where it can accumulate over a lifetime. Thus, even small exposures, if repeated often, can create high body burdens. Pregnancy and osteoporosis, which cause demineralization of bone, may release bone-based lead back into the blood stream.

### **Who's At Risk?**

***Because of their rapidly developing nervous system, fetuses and young children are most vulnerable to lead poisoning.***

***Special Concerns in Pregnant Women*** If pregnant women have high levels of lead in their body, fetuses are at risk because lead crosses the placenta and appears in umbilical cord blood at nearly the same concentration as in the mother's blood. Lead may be passed along with calcium to a fetus from the mother, and through breast milk after an infant is born.

***Special Concerns in Children*** Small children are at risk, in part, because their natural exploratory behavior leads them to put things in their mouths and in so doing ingest lead from dust, soil, and flaking paint. Further, they absorb up to 50 percent of the lead they ingest.

### **Health Effects of Lead**



At blood levels of 20 micrograms/deciliter (ug/dL) and above, lead can cause anemia and high blood pressure. Lead exposure has also been associated with male and female reproductive problems, such as infertility, spontaneous abortion and stillbirth.

Blood levels above 120 ug/dL in adults and 100ug/dL in children have been associated with acute toxicity of the nervous system and death. In children, exposures characterized by blood lead of 15-40 ug/dL cause central nervous system dysfunction, characterized by subtle, but irreversible deficits in intelligence, behavior, and school performance. Exposure of fetuses to maternal lead has been correlated with decreases in a child's mental development.

### **What can I do exposure, and**

***Seek individual advice from a physician if the blood lead level of a child or a woman of reproductive stage is 10 ug/dl or above.***

## exposure, to lead?

Since even very low levels of lead could produce undesirable health and intellectual effects without any apparent clinical signs, the following control measures should be taken by all families, especially those with young children, and women of reproductive age.



- ◆ Have children tested for lead
- ◆ Test pre-1978 houses for lead paint. If it contains lead, remove deteriorating lead paint. Take care of peeling and chipping paint, and avoid exposure to dust from renovation and abatement projects. Seek a trained contractor to do remodeling or repairing and seek advice from the health department before doing so.
- ◆ Take off shoes before entering the house.
- ◆ Wet mop floors, and wash window wells often to get rid of dust.
- ◆ Wash children's hands frequently and before meals.
- ◆ Avoid using lead-glazed pottery or pewter dishes for serving food.
- ◆ Keep children's play areas away from heavy traffic and lead contaminated areas.
- ◆ Eat a well-balanced diet containing large amounts of Vitamin C, calcium, and iron.
- ◆ Use water from the cold tap for drinking and cooking. Flush faucets for 2-3 minutes when the water hasn't been used for more than 6 hours.
- ◆ Have tap water tested in a certified laboratory for lead if the house is over 40 years old or has plumbing under ten years old.
- ◆ Plant grass and shrubs over bare dirt in the yard.
- ◆ When planting a vegetable garden in high-exposure areas, plant fruit and leafy vegetables, which take in less lead than root crops.
- ◆ Wash fruits, vegetables, and hands before eating.
- ◆ Shower and change clothes as soon as possible if exposed to lead at work or hobbies.

*This fact sheet is compiled by Dr. Karen Chou, Michigan State University TOSC Program. The information is based in part on "Lead Poisoning and Children", the Minnesota Department of Health, "Lead in Soil," the California Dept. of Health and Human Services, and "Alternatives: A Washington Toxics Coalition Fact Sheet," Washington Toxic Coalition.*

*The Technical Outreach Services for Communities (TOSC) Program provides independent technical expertise to communities with contaminated sites and promotes community involvement in site-cleanup projects. For more information about TOSC, please contact Kirk Riley, TOSC Program Director, at (800) 490-3890.*

