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Lead Levels: Why Do They Need To Be Checked?

Elevated blood lead levels mean your child may have been exposed to environmental lead that may pose a hazard to his/her health. Even low levels of lead in blood have been shown to affect IQ, ability to pay attention, and academic achievement. And effects of lead exposure cannot be corrected. The most important step parents, doctors, and others can take is to prevent lead exposure before it occurs.

Lead is a soft metal found throughout the environment in air, soil, household dust, food, some drinking water and certain types of pottery, porcelain, and pewter. Children are usually exposed when they put paint, soil, dust or other materials containing lead into their mouths.

Blood tests are used to find out how much lead is in a child's blood. These tests may show a blood lead level that is:

1. normal (<5 mcg/dl)
2. higher than normal, but does not require medical treatment (5-44 mcg/dl)
3. possibly harmful and requires medical treatment (>45 mcg/dl)

What Are The Symptoms Of Lead Poisoning?

Symptoms of elevated lead levels are difficult to distinguish from other common illnesses. Common signs include: poor appetite, stomach aches, vomiting, constipation (not diarrhea), crankiness, loss of energy, anemia, headaches, and trouble sleeping.

Very high lead levels may cause coma, convulsions, and death.

Repeated exposure to small amounts of lead can also cause lead poisoning because the lead accumulates in the body. The brain is most sensitive to lead exposure during the first 6 years of life. Exposure to low levels of lead can harm a child's brain and nervous system. The brain damage results in such problems as lowered IQ scores (an average of 7 IQ points lost), decreased attention span, decreased hearing, speech delays, and other developmental delays.

However, some children with only slightly elevated lead may not have any obvious symptoms. This is why it is necessary to perform lead screens on all children.

How Is A Screening Blood Lead Level Obtained?

Lead poisoning is diagnosed by a blood test. Routine screening lead levels are first drawn in our office by a finger stick (easier for child). A level of < 5 mcg/dl is normal. If your child's lead level is found to

be > 5 mcg/dl, it will be necessary to repeat the lead level by taking blood from a vein. An elevated lead level obtained by finger stick does not mean your child has lead poisoning. Most children (who are not in the high risk category), will have a normal lead level when repeated by blood taken from a vein. It is not known why some lead levels, obtained by finger stick, are reported back as being falsely elevated.

Lead levels >5 and less than 14 need to be repeated in 3-4 months. Lead levels between 15-19 require a repeat lead level in 3-4 months with evaluation of the environment for possible lead exposure.

Lead levels 20 - 45 (blood taken from a vein) may require medical treatment in a hospital.

When Should Children Be Screened?

All children should be screened at 9-12 months of age and again at 2 years of age, unless they are identified as being at "high risk" (see below).

Children, aged 3 to 6 years, with no prior record of lead screening, should also be screened.

Some cities and states have very specific screening requirements and follow-up recommendations, based on the prevalence of high risk factors (see below). Philadelphia has a very high estimated prevalence of elevated lead levels and predominantly older housing with high levels of lead base paint (see below).

The Centers for Disease Control and Prevention consider the following situations as "high risk" for increased lead exposure:

1. The child lives in or regularly visits a house or structure with peeling or chipped paint that was built before 1960, including day care centers, preschools, or homes of baby sitters and relatives. Most paint manufactured before 1960 contained lead.
2. The child lives in or regularly visits a home that is being renovated and was built before 1960.
3. The child has a brother, sister, housemate, or playmate who is being followed or treated for lead poisoning.
4. The child lives with an adult whose job or hobby involves exposure to lead. Examples of such jobs or hobbies include furniture refinishing, making stained glass, making pottery, using indoor firing ranges, and working in industries such as automotive repair, bridge, tunnel, and elevated highway construction.
5. The child lives near an active smelter, battery recycling plant, mine tailing pile, or other industry likely to release lead.
6. The child receives medical treatment for removal of a foreign body from the ear, nose, or stomach.
7. The child has the habit of swallowing nonfood substances known as pica.
8. The child is less than 6 years old and has an unexplained developmental delay, hearing defect, irritability, severe attention deficit, violent tantrums, or unexplained anemia.
9. The child lives in a neighborhood at high risk for lead poisoning (identified by zip code).

Children who remain at high risk for lead exposure should be tested for lead at least every year until their sixth birthday. The lead levels when a child is 9-12 months old and 24 months old are especially important.

Is There Ways To Tell If My Child Has Been Exposed?

Check the following lists to determine if your child may be exposed to lead. The only way to determine the actual lead exposure is by having a blood lead test done.

Have any of the following activities occurred at your residence within the last year?

1. Sanding wood floors
2. Sanding or dry scraping painted surfaces
3. Tearing down old plaster walls
4. Removing painted woodwork
5. Weatherizing windows
6. Dry sweeping carpet or loose paint chips
7. Replacing windows
8. Wearing dirty work clothes around the house or in the car
9. Washing work clothing with other clothing
10. Any type of paint removal or furniture repair
11. Gardening or yard work with children
12. Cleaning air conditioning or heating duct work
13. Smoking cigarettes

Do Your Children:

1. Chew on or pick at painted objects, woodwork, or plaster?
2. Chew on varnished woodwork?
3. Eat or play with cigarette butts or ashes?
4. Chew on or play with fishing sinkers or lead toys?
5. Eat comic books, newsprint, colored paper or magazines?
6. Play with or eat soil or loose dirt?
7. Chew on objects that may be dirty or painted?
8. Eat or play with loose paint chips in the window wells?
9. Play or sleep with pets that go outside and get their coats dirty?

Sources of Lead Exposure

Paint: The most common source of lead exposure for children is lead-based paint. This paint was also used on some older toys and furniture. Lead was finally banned from house paint in 1978. Three quarters of all houses built before 1960 contain lead-based paint. When paint chips or peels, young children can pick up these particles and chew them.

Dust: More commonly, children swallow dust and soil contaminated with lead paint. Home remodeling and sanding especially, put a great deal of lead powder into dust and soil. Be aware of remodeling being done near your home.

Soil: may have lead in it from exterior lead paint chips and dust, lead-based insect sprays and highway pollution (due to past use of lead in gasoline).

Food: Food may be contaminated if it is:

1. grown in soil that contains lead
2. stored in poorly glazed pottery
3. kept in open cans with lead seams
4. kept in lead crystal prepared by someone who has lead dust on his or her hands.

Air: The almost complete phasing out of leaded gasoline in the U.S has markedly reduced the amount of lead present in the air from automobile exhaust.

Folk Remedies and Cosmetics Containing Lead:

1. Hispanic: azarcon, greta, alarcon, coral, rueda, liga, Maria Luisa
2. Asian: pay-loo-ah, chuifong tokuwan, ghasard, bali goli, kandu, hau ge fen
3. Middle Eastern/Indo-Pakistani: maha yogran guggulu, surma, kohl, alkohol, saoot, satrinj, bint dahab

Occupational and Recreational Lead Sources:

1. Metal welders, cutters, ship breakers, bridge and highway construction workers
2. Lead smelter workers, refiners and miners
3. Storage battery manufacturers, repairers and recyclers
4. Painters, construction workers (sanding, scraping, spraying, demolition of lead-painted sites)
5. Auto radiator repairers
6. Firing range instructors or enthusiasts, shot or bullet makers or recasters
7. Plumbers, solderers, wire and cable workers, type founders, auto mechanics and factory workers
8. Potters, glazers, enamellers, artists, stained glass makers (occupational and hobbist)
9. Home and furniture repairers, remodelers (occupational and hobbist)
10. Manufacturers of rubber products or electronics, jewelers, pipefitters, printers
11. Workers with high exposure to lead gasoline exhaust fumes (rare in US today)

Water: may pick up lead as it flows through plumbing with lead pipes, fixtures or solder. Lead is found in low levels in some drinking water because lead-based solder on old water pipes may add lead to water. Lead-based solder was not banned for use with water pipes until 1986.

Only a small amount of human lead ingestion is believed to come from drinking water. The Environmental Protection Agency (EPA) sets drinking water standards and has determined that lead is a health concern at certain levels of exposure.

If lead is present in drinking water, it usually has entered the water after leaving the local water treatment plant. The most likely source for lead contamination is the home. It is commonly caused by corrosion which results from the interaction between the water and the lead pipes or lead-based solder.

All water treated by Philadelphia Suburban Water Company (PSW) has no detectable level of lead. Water samples from customers throughout the system are tested because customer plumbing (from the curb to the residence or business) in some cases does contain lead. Test results still show lead concentration far below the level permitted by the EPA.

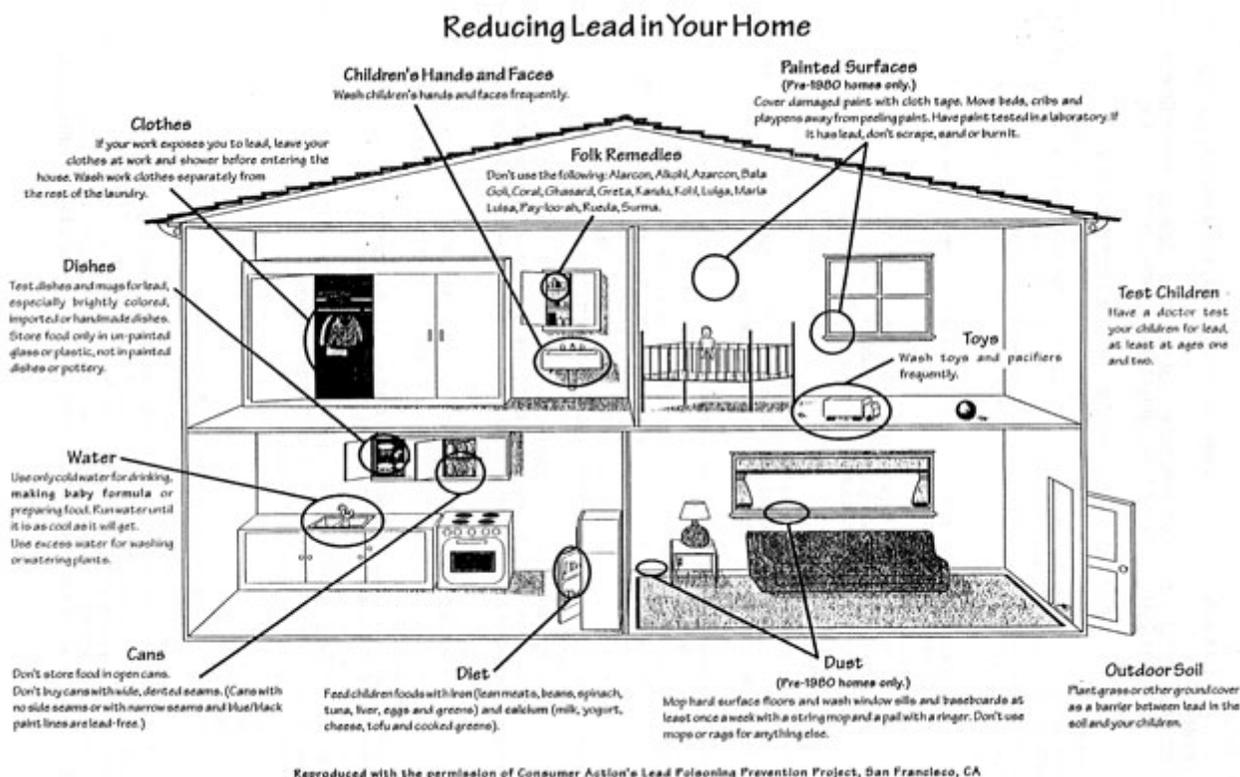
Lead levels in your drinking water may be elevated if:

1. Your plumbing has lead pipes or copper pipes with lead solder and particularly if water sits in these pipes for several hours, allowing lead to dissolve into the water.
2. Your home is more than five years old or has soft or acidic water (Some home treatment devices may also make water more corrosive.)

Federal law for use on new household plumbing and repairs now requires lead-free solder and lead-free materials. PSW employees use only lead-free solders and flux to repair, replace and maintain all plumbing.

If drinking water is determined to have high levels of dissolved lead, or if there is even a suspicion of lead contamination, there are ways you can minimize your exposure:

1. When water stands in pipes more than a few hours, "flush" each cold-water faucet by letting the water run for two or three minutes.
2. Flushing the toilet, showering or doing laundry with cold water will also move water through the plumbing system. This can reduce the amount of time needed to flush cold water faucets from up to three minutes to 30 seconds or less.
3. Do not cook with or drink water from the hot water faucet. Especially avoid using hot tap water for making baby formula.



Important Facts about Prevention of Lead Poisoning

The best prevention of lead poisoning is to eliminate your child's exposure to lead in the environment.

Children naturally place fingers and thumbs in their mouth. It is important to know that this is the primary way that children are exposed to lead. They also teethe on objects, eat non-food items (this activity is called pica), and place objects, such as toys, paint chips, plaster, or soil in their mouth.

Keep a careful watch over your child. Educate babysitters and child care workers to encourage children to wash their hands.

1. Make sure your child is not exposed to peeling paint. Pay special attention to windowsills.
2. Rinse your child's hands and face before he/she eats.
3. Rinse toys and pacifiers frequently.

4. If your child sucks his/her thumb or fingers, rinse his/her hands frequently.
5. Wet-mop your hard surface floors using a high phosphate detergent, like dishwasher soap. Mix 2 tablespoons of high phosphate detergent in one gallon of water.
6. Close off rooms that are being remodeled and provide good ventilation (creates lead dust that adds to the total amount of lead in house dust).
7. If you have leaded paint on the outside of your house, keep lead dust from being tracked into your house. Have a washable mat at each door entry so everyone who enters wipes his or her feet. If the soil around your house is definitely contaminated with lead, have a rule that people take off their shoes before coming into your house.
8. If the soil around your home is contaminated with lead, replace it or plant bushes next to the walls so children cannot play there.
9. Keep children away from deteriorating areas, loose paint, holes in the wall, and bare soil.
10. The ground cover should act as a barrier between the child and the contaminated soil. This cover can be disrupted by dogs digging holes. Provide fenced areas and deep sand pits for dogs to dig.
11. Do not store food or drink in pottery that may not have been fired correctly.
12. Make sure that your child is not being exposed to lead through contact with adults who have occupations or hobbies that involve lead.
13. If you need water for cooking or for preparing formula, use only water from the cold water tap. If the water has not been used for several hours, let the water run for 2 minutes before you use it. (Lead dissolves more in warm water or standing water.) If you are concerned, have your water tested for lead.

Does Diet Play A Role In Lead Poisoning Prevention?

Make sure your child's diet contains adequate iron and calcium. Both of these minerals make it harder for your child's body to absorb lead.

1. Good sources of Iron include: lean red meats, chicken, fish, leafy green vegetables (spinach, broccoli, and beet greens), dried beans (peas and lentils), dried fruit (raisins, prunes and apricots) and iron-enriched breads and cereals.
2. Good sources of Calcium include: milk, orange juice fortified with calcium, cheese, yogurt, leafy green vegetables (turnip and collard greens), kale, salmon and sardines.
3. Decrease fats and oils by avoiding the following foods:
 - o fried food such as French fries, fried chicken and potato chips
 - o pastry, cakes, and other baked goods
 - o butter, oil, and lard
 - o hamburgers, bologna, salami, and bacon (fatty meats)

Treatment of Lead Poisoning

Children with high levels of lead in their blood or symptoms of lead poisoning need to start taking a medication (called a chelating agent) that binds with the lead and carries it out of the body.

All children with elevated levels of lead need to be protected from re-exposure to the lead until it is removed. A public health agency or housing agency should carefully inspect the child's home environment for lead hazards. The family should take all of the recommended precautions for preventing lead exposure.

For more information on lead in drinking water, you can call the EPA toll-free hotline at 800/426-4791 or call the Customer Service Department at the number printed on your bill.

To learn more about preventing lead exposure, visit CDC's Web site at www.cdc.gov/nceh/lead/

Learn more at EPA's Renovation, Repair, and Painting rule Web page:

www.epa.gov/lead/pubs/renovation.htm.

Childhood Lead Poisoning Prevention Questionnaire

	YES	NO
1. Does your child live in or regularly visit a house, a day-care center or a nursery school that was built before 1960 and has peeling or chipping paint?		
2. Does your child live in a home built before 1960 that is being remodeled or renovated?		
3. Does your child live near a heavily traveled major highway where soil and dust may be contaminated with lead?		
4. Have any of your children or their playmates had lead poisoning?		
5. Do you give your child any home or folk remedies which may contain lead?		
6. Does your child often come in contact with an adult who works with lead--in construction, welding, plumbing, pottery or other trades?		
7. Does your child live near a lead smelter, a battery-recycling plant or other industrial sites likely to release lead?		
8. Does your home plumbing have lead pipes or copper with lead solder joints?		

Under recent federal clarification, a child, whose parent has answered "yes" to one or more of the risk assessment questions is determined to be at "high risk." A child, whose parent has answered "no" to all questions, is determined to be at "lower risk."

This information should not be used as substitute for the medical care and advice of your child's physician. Health related topics found on the Andorra Pediatrics web site should not be used for diagnosing purposes or be substituted for medical advice. As with any new or ongoing treatment, always consult your professional healthcare provider before making any changes in treatment or beginning any new treatment. If you have any questions or concerns, please call our office.