



Lead Poisoning

What is it and who is affected?

Lead is a highly toxic substance, exposure to which can produce a wide range of adverse health effects. Both adults and children can suffer from the effects of lead poisoning, but childhood lead poisoning is much more frequent. Over the many years since we have known about the hazards of lead, tens of millions of children have suffered its health effects. Even today, in 2008, there are still an estimated 310,000 children under the age of six who have too much lead in their blood.

Where is it found?

There are many ways in which humans are exposed to lead: through deteriorating paint, household dust, bare soil, air, drinking water, food, ceramics, home remedies, hair dyes and other cosmetics. Much of this lead is of microscopic size, invisible to the naked eye. More often than not, children with elevated blood lead levels are exposed to lead in their own home.

By far the biggest source of concern is the lead paint that is found in much of our nation's older housing. Until 1978, lead paint was commonly used on the interiors and exteriors of our homes. Today, the US Department of Housing and Urban Development (HUD) estimates that about 38 million homes in the US still contain some lead paint. While lead paint that is in intact condition does not pose an immediate concern, lead paint that is allowed to deteriorate creates a lead-based paint hazard. It can contaminate household dust as well as bare soil around the house, where children may play. In either situation, a child who comes into contact with lead-contaminated dust or soil is easily poisoned. All it takes is hand-to-mouth activity, which is perfectly normal for young children to engage in. All it takes is the lead dust equivalent of a single grain of salt for a child to register an elevated blood lead level.

According to HUD, about 25% of the nation's housing stock—some 24 million homes—contains significant lead-based paint hazards, i.e. deteriorating lead paint or lead-contaminated dust. These are the homes producing the vast majority of the childhood lead poisoning cases we see today.

Children and adults too can get seriously lead poisoned when renovation and remodeling activities take place in a home that contains lead paint. Anytime a surface containing lead paint is worked on, the debris and the dust created by the work must be contained and thoroughly cleaned up, and those doing the work must have adequate personal protection to prevent them from breathing in any lead dust generated by the work. It is therefore of critical importance that lead painted surfaces be identified prior to the commencement of

any renovation or remodeling work, and that lead-safe work practices are used during such activities. Of course, steps must also be taken to ensure that children, pets, and personal belongings including furniture are protected from exposure to lead while work is ongoing, as well.

The past use of leaded gasoline, only recently banned in this country, contributed greatly to the number of cases of childhood lead poisoning in the US during the last sixty years or so. The lead produced by vehicle emissions continues even today to present a hazard, as much of that lead now remains in soil where it was deposited over the years, especially near well-traveled roads and highways. Children who play in dirt contaminated by lead (whether that lead is from gasoline emissions or from deteriorated house paint) can end up with lead-contaminated soil under their fingernails or on their toys, or they can track it into their homes. Even pets can come into contact with lead-contaminated soil and cause human exposure to lead. In each such case, an elevated blood lead level can easily result.

Drinking water can also sometimes contribute to elevated blood lead levels. Lead can leach into drinking water from certain types of plumbing materials (lead pipes, copper pipes with lead solder, and brass faucets). While water is usually not the primary source of exposure to lead for children with elevated blood lead levels, it is nevertheless important to note that formula-fed infants are at special risk of lead poisoning, if their formula is made with lead-contaminated water.

What are the health effects?

There are many different health effects associated with elevated blood lead levels. Young children under the age of six are especially vulnerable to lead's harmful health effects, because their brains and central nervous system are still being formed. For them, even very low levels of exposure can result in reduced IQ, learning disabilities, attention deficit disorders, behavioral problems, stunted growth, impaired hearing, and kidney damage. At high levels of exposure, a child may become mentally retarded, fall into a coma, and even die from lead poisoning. Within the last ten years, children have died from lead poisoning in New Hampshire and in Alabama. Lead poisoning has also been associated with juvenile delinquency and criminal behavior.

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 house painting, 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. Workers in these occupations must also take care not to leave their work site with potentially contaminated clothing, tools, and facial hair, or with unwashed hands. Otherwise, they can spread the lead to their family vehicles and ultimately to other family members.

When a pregnant woman has an elevated blood lead level, that lead can easily be transferred to the fetus, as lead crosses the placenta. In fact, pregnancy itself can cause

lead to be released from the bone, where lead is stored—often for decades—after it first enters the blood stream. (The same process can occur with the onset of menopause.) Once the lead is released from the mother's bones, it re-enters the blood stream and can end up in the fetus. In other words, if a woman had been exposed to enough lead as a child for some of the lead to have been stored in her bones, the mere fact of pregnancy can trigger the release of that lead and can cause the fetus to be exposed. In such cases, the baby is born with an elevated blood lead level.

Exposure to lead is estimated by measuring levels of lead in the blood (in micrograms of lead per deciliter of blood). The US Centers for Disease Control and Prevention (CDC) has set a "level of concern" for children at 10 micrograms per deciliter. At this level, it is generally accepted that adverse health effects can begin to set in. However, recent research published in the *New England Journal of Medicine* provides new evidence that there could well be very harmful effects occurring at even lower levels of exposure, even as low as 5 micrograms of lead per deciliter of blood. In other words, science is now telling us that there is in fact no level of lead exposure that can be considered safe.

How can I check my home to see if it contains lead-based paint hazards?

If you live in a home built before 1960, it is very likely that it contains some lead paint. Homes built between 1960 and 1978 may also contain lead paint, but they are less and less likely to, the closer you get to 1978, when the Consumer Product Safety Commission finally issued its ban against lead-based paint. If you live in a home built before 1978 that also has been allowed to deteriorate for a few years, you may have a lead-contaminated dust problem. To find out if your home contains lead paint or a lead-based paint hazard, you should hire a professional.

If all you want to do is find out if there is lead paint in your home, you should hire a lead inspector to test all the paint. Depending on the size of your home, this normally takes between one and four hours. You will know the results of the inspection on the spot. The inspector will be able to tell you whether or not there is lead paint in the home, where it is, and the concentration of lead in the paint. (Older homes contain higher concentrations of lead in paint than homes built after the early 1950s. The higher the concentration, the greater the hazard once the paint deteriorates.)

If you also want to find out if your home contains any lead-contaminated dust, which is the most dangerous of all lead-based paint hazards, you should hire either a risk assessor or a sampling technician. They will take samples of dust throughout your home and then send them to a laboratory for analysis. You should be able to learn the results within three to seven days. You will learn whether there is any lead-contaminated dust in your home and where it was found. A risk assessor can also tell you what you should do next to take care of the problem. Alternatively, you can buy a dust sampling kit and carefully do the sampling yourself, send the samples to an appropriate laboratory for analysis, and get the results directly from the lab. This is a less expensive way to find out about lead-contaminated dust in your home. The National Safety Council offers a lead dust test kit that includes everything a consumer needs to determine the presence of lead dust in their home, including detailed instructions and a pre-stamped, pre-addressed envelope to the lab for sample analysis. **[Download an order form.](#)**

Various manufacturers also offer what is called a "spot test kit," basically a sampling tool that uses a chemical process to help consumers figure out if there is lead present in household paint, or even on ceramicware or on toys. However, spot test kits are not considered completely reliable tools in terms of their accuracy, and they should not be relied upon for definitive answers regarding the presence of lead paint.

To locate a lead inspector, a risk assessor, or another certified professional in lead hazard evaluation and control activities, proceed to the Lead Listing at <http://www.leadlisting.org>.

What are some simple steps to take to prevent or reduce lead exposure?

Maintain the paint in your home and clean up any lead dust. If you live in a home built before 1978, the most important step to take to reduce the risk of exposure to lead is to make sure that the paint is well maintained. Whenever repainting, renovation, or other work is undertaken that may end up disturbing a painted surface, it is critical to moisten the surface first, in order to prevent the work from generating dust. Similarly, all painted debris from the work should be contained, in other words prevented from spreading beyond the area where the debris can be carefully gathered and then safely disposed of.

If you think you may have a lead dust problem, you can clean up lead-contaminated dust yourself by carefully and thoroughly washing the area, using soapy water and a mop. A three-bucket system is ideal, with one bucket holding the soapy water (a general all-purpose cleaner is adequate, but dishwasher soap containing phosphates or a lead-specific detergent may be more effective), a second bucket serving as the rinse bucket, and the third containing only clean water. After you wash a section of floor with the soapy water, rinse the mop in the rinse bucket, then dunk it in the clean water bucket, and finally dip it back in the soapy water bucket before cleaning the next area. For smaller areas such as window sills, a rag should be used instead of a mop. Once done, throw the mop or rag away. Whenever cleaning lead-contaminated dust, vigorous wiping is most effective in removing the lead. However, wiping should never be done in a back-and-forth manner, but rather from left to right (or vice-versa), or from the top of a wall downwards.

Once cleaning has been completed for a given room, it is time to rinse, using only clean water and preferably a new mop head.

Remember that if you do have a lead dust problem, you will also need to address the source of the lead dust. In many instances, lead dust particles are generated by friction caused by the opening and shutting of old windows. With old, deteriorating windows, outright window replacement may be the best option. In addition to solving your lead dust problem, this also typically results in significantly increased energy efficiency, higher property values, and lower heating and cooling bills.

If you have a young child in your home and you suspect there may be a lead problem, take the recommended steps to eliminate any lead-contaminated dust, and make sure the child washes his/her hands frequently. Also make sure to clean any toys that have been lying about in areas that you suspect may contain lead-contaminated dust.

Check the water. To ensure your drinking water does not contain a hazardous level of lead, test the water at your faucets. Call the EPA Safe Drinking Water Hotline at 800-426-4791 for more information. Kits for testing water, along with the instructions for doing so, are available from a number of providers.

Eat right. The amount of lead the human body retains can be reduced if you make sure your child's diet includes plenty of foods that contain iron, calcium and zinc. Foods rich in iron include eggs, raisins, greens, beans, peas, and other legumes. Dairy products such as milk, cheese, and yogurt are recommended for their high calcium content. Lean red meat and oysters are examples of foods that contain zinc. Avoid giving children fried or fatty foods—although remember that a certain amount of dietary fat is vital for children under two years of age. And make sure your children always wash their hands before eating.

Check your ceramic ware. Some pottery may contain lead that can leach into food and drinks. Avoid eating off any colorfully painted ceramic plates, and avoid drinking from any ceramic mugs unless you know they do not leach lead. This is particularly important if the pottery was made in Mexico or another Latin America country, or in Asia. Generally, pottery made in the US, in Canada, or in Western Europe tends to be safe.

Do not store alcohol in crystal containers. Crystal decanters and glasses are often made with lead. When an acidic substance or alcohol is left in these containers for longer than just a few hours, there is a risk that the lead could leach into the liquid.

Cover bare soil play areas. You should ensure your child avoids playing in bare soil areas unless you know they are lead free. Often, bare soil will contain some lead, either deposited there by vehicle emissions from leaded gasoline days, or from deteriorated exterior paint. This is frequently the case in vacant lots, where old buildings once stood, or in a neighborhood where extensive renovation work may have occurred. If you have a bare soil problem, the easiest way to reduce the risk is to cover the soil with mulch (for instance, pebbles, shrubbery, or grass). A child who plays in lead-contaminated bare soil is likely to get some under his/her fingernails, which will eventually find their way into his/her mouth, or on toys, or on their shoes, which could track the lead into the home. Similarly, a dog that rolls around in lead-contaminated bare soil may end up transporting some of that lead into the home.

What laws help prevent lead poisoning?

At the Federal level, the Lead-Based Paint Hazard Reduction Act of 1992, known as Title X (Title ten), is the source of much of the law of the land on lead paint. One of its most important requirements is the disclosure of known lead hazards at the time of the sale or lease of a home built before 1978. Sellers and landlords must also provide a pamphlet on lead poisoning to the buyer or renter before the pre-1978 property is sold or rented.

The Federal lead hazard disclosure laws have been vigorously enforced by the US Department of Housing and Urban Development (HUD), the US Environmental Protection Agency (EPA), and the US Department of Justice (DOJ). For the past five

years, these Federal agencies have been working closely together to help ensure that property owners and real estate agents comply with the Title X disclosure requirements.

Similarly, Title X also requires renovators, remodelers, and others who conduct such activities for compensation in homes built before 1978 to provide the pamphlet entitled *Protect Your Family From Lead in Your Home* to the owners and occupants of affected housing, prior to beginning the work.

At the state or local level, your state or municipality may have enacted additional laws to protect you from lead poisoning. Check with your state and local health and housing departments for details.

Code enforcement is another important legal tool that can be used to prevent lead poisoning. Most local codes already prohibit chipping, peeling paint conditions.

Generally, under what is called "common law," tenants have a right to live in safe housing, otherwise known as the implied warranty of habitability. Premises that contain lead-based paint hazards are inherently unsafe places to live. If you can demonstrate that your rented home contains a lead-based paint hazard, you should immediately contact your landlord or property manager and notify them of the presence of a lead hazard. Do it in writing and keep a dated copy for your records. If they fail to respond in a timely and effective manner to this notification, you may have legal recourse against them. Consult an attorney for further information—and take your own precautions.