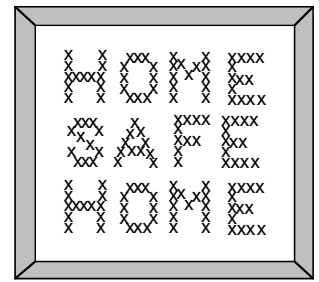


Alternatives

A Washington Toxics Coalition Fact Sheet



Reducing Exposure to Lead in Older Homes

by John W. Roberts



Toddlers are the group with the highest risk from lead in homes.



Wood homes built before 1950 have the highest lead levels, while those built between 1950 and 1980 probably have somewhat lower levels.

More than 66,500 Washington toddlers living in pre-1950 houses have a risk of relatively high exposure to lead (chemical symbol Pb). Lead is a toxic metal which can cause reduced growth, hearing loss, and impaired learning ability. Lead is tracked in from the yard and street on shoes. It also is released if old paint inside the house is disturbed. Lead accumulates in the dust in rugs, carpets, and furniture. This dust gets on the hands and other things infants put in their mouth and is their largest source of lead intake. The amount of lead in an infant's blood appears to be directly related to the amount of lead in the house dust. Remodeling, peeling paint, and painting in an older house may triple the lead exposure of a toddler. House dust also contains residues of pesticides, combustion products, allergens, and other toxic substances.

Parents can reduce the lead in rugs by a factor of ten or more by removing shoes at the door, using high quality door mats, and vacuuming more thoroughly. Some types of vacuum cleaners and rugs are much better than others in this respect. Improving personal hygiene and housekeeping are proven ways to reduce lead in the blood of children, and they may protect a child's ability to learn. Parents can make a real difference by taking the steps outlined in this chapter.

Why Homes are Dusty

There are many reasons why some homes are dusty. These days many parents have full-time jobs outside the home, leaving them little time to vacuum, mop, and clean. They may be reluctant to spend their precious minutes at home doing housekeeping, and so cleaning is not as thorough as it could be. The vacuum cleaner may be broken, the belt loose, or the bag full. Or it may be a canister-type cleaner that collects only 10% of the dust.

New information on the amount of lead in the dust in older homes raises serious health concerns. What are the actual risks from lead in your home, and what can you do about them now? How much will it help? How much time will it take, and how much will it cost? These and other questions will be answered in this article.

Health Effects of Lead

Reduction of the lead content in paint, food, and gasoline has lowered the blood lead of children dramatically. However, recent data have shown health effects of lead in toddlers at levels formerly considered harmless. It is estimated that 317,000 (1.6%) of the preschool children in the United States still experience lead poisoning that can cause lower growth, hearing loss, and reduced learning ability. These children have blood lead levels greater than 10 micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dl}$), the current "action level" for lead. Rates are higher among blacks (3.1%) and Mexican Americans (2.0%) compared with white children (1.3%). In addition thousands of fetuses are exposed each year to lead in their mother's blood at $10 \mu\text{g}/\text{dl}$ or above, levels which can cause early birth, reduced birth weight, and lower IQ.

Lead poisoning in the United States is a silent epidemic. It goes unnoticed because there are no clinical symptoms at the $10 \mu\text{g}/\text{dl}$ level. Physicians rarely test for lead unless they see clinical symptoms. Lower income groups have the highest risks because old or peeling paint is often found in low-income housing. The U.S. EPA believes there is no

“safe” level of lead in a child’s blood and that damage to a child’s intelligence may occur below the 10 µg/dl level.

Sources And Pathways

Toddlers are the group with the highest risk from lead in homes because of their crawling and mouthing activity as well as their vulnerable developmental stage. It is estimated that toddlers in a clean suburban home receive at least 40 times as much lead from ingesting dust as from air. Children absorb more of the lead they ingest than adults do. The best single predictor of a toddler’s blood lead appears to be the amount of lead in the rug where the child plays. Some infants go through episodes of eating paint chips and chewing on window sills. (Lead-based paint chips taste sweet.) Such behavior may produce the most health damage.

It is estimated that the average 2-year-old child takes in the following amounts of lead each day: 0.2 micrograms (µg) from air, less than 10 µg from food and liquids, and 7 to 200 µg from dust. The lead intake from dust in a remodeled older home can reach 800 µg/day. Many children will exceed the provisional tolerable intake (set by the FAO/WHO Expert Committee on Food Additives) of 42 µg Pb/day for a 26 lb child. There is no margin of safety between the acceptable level of lead intake and typically expected levels in an old house.

Sources of childhood lead include remodeling and repainting activities, peeling paint, food, pottery, home remedies, air, water, and track-in of lead in soil and street dust from outside the home. Very few cases of excess lead in water have been reported in Seattle. But the average fine dust and soil lead concentration in Seattle homes built before 1940 exceeded the 400 ppm EPA cleanup standard for superfund sites. Many of these samples of house dust would be classified as hazardous waste (above 1000 ppm lead) in California. Lead levels in paint vary even among houses of the same age, but generally speaking homes built before 1950 have the highest levels, while those built between 1950 and 1980 probably have somewhat lower levels. Until measurements are taken, assume that lead is present in homes built before 1980.

Lead from auto emissions and paint scrapings collects in surface soil in urban areas, where it has left a permanent legacy averaging 100 to 200 ppm lead in urban soil. Much higher lead levels are found near homes, where exterior lead paint and auto emissions that collect on the surface of the house have contaminated adjacent soil. Lead in fine soil around the foundations of older wood buildings in Seattle ranges between 1000 and 6000 ppm. Some of this lead is tracked into house dust. Air ducts and window wells can also be major sources of lead.

Remodeling activities, painting, and peeling paint or broken plaster in houses over 50 years old may produce large amounts of lead in house dust and consequently in a toddler’s blood. The Consumer Product Safety Commission issued safety alerts in 1988 and 1990 on the hazards to children from removal of lead paint in homes.

How to Monitor Dust And Lead Levels in Your Home

The ATSDR recommends monitoring the lead exposure (and blood lead if they are in a high risk group) of preschool children who live in pre-1950 houses. Measuring the dust and lead in rugs is necessary to control exposure. The first step is to see just how much dust you have in your house. The fastest way to determine if your rug may be safe for an infant to crawl on is to use a vacuum cleaner with an agitator and a dust sensor or “dirt finder.” The “dirt finder” is found on models sold by Hoover, Sears, and Panasonic. It indicates with a green light when no more dust is coming from the rug. If the green light comes on (on the high sensitivity scale), it indicates that dust levels should be safe. The less dust, the less exposure to lead, dust mites, molds, and toxic chemicals in the dust.

If you do not have a vacuum cleaner with a dust sensor, it is still possible to find out how much dust is in your carpet by weighting the dust collected from a measured area of carpet. For instructions on this procedure, contact us at (206) 632-1545 or (800) 844-SAFE.

Transfer of Pollutants from Outdoors into Home

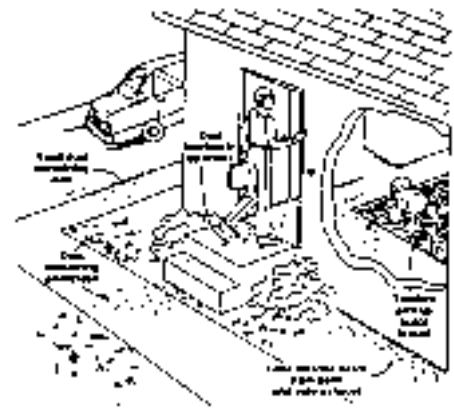


Illustration courtesy of Wayne Ott

Lead, pesticides, and other pollutants from outdoors are tracked-in on shoes. They lodge in the dust in rugs. Toddlers pick up the pollutants on their hands and inadvertently eat them. Some children also eat much larger than average amounts of dirt.

The total dust level does not tell you the amount of lead in your home—for that you will need to have a laboratory analysis of the dust. Contact a local analytical laboratory for instructions. Send in the sampling bag as directed. Expect to pay about \$75. In two weeks you will know the lead levels for a child who plays on the rug. This is the only way to tell if the rug is relatively safe after remodeling or having peeling paint in the home. If you use a consultant to handle the entire testing process, expect to pay about \$300.

You will need to consult with your doctor if you want a blood test. Typically such tests cost around \$70 plus the cost of the office call and blood collection. This cost may be covered by health insurance, especially if your doctor believes your child is at high risk because of remodeling, peeling paint, or activities such as eating paint chips or chewing on the window sill.

Reducing Lead Intake

Recent research strongly suggests that it is prudent to reduce the lead exposure of all children to the lowest practical level, especially if a toddler lives in a home built before 1950. Parents can control most of a child's lead intake which comes from dust.

Removal of shoes is the most effective way to stop track-in. Make it convenient for people to take off their shoes by providing a shoe rack, a bench to sit on, slippers, and a sign on the outside of the door. A high-quality door mat may be 50-80% as good, provided you wipe your feet twice on the mat. A thick, rubber-backed mat, such as those found in commercial establishments, is best. You can special order a "Twister" door mat (available from Pacific Mats) from large hardware stores. Good personal hygiene; cleaning furniture, walls, and woodwork; selecting floor surfaces that are easy to clean; and frequent use of an efficient vacuum are also important. Taken together, these measures can reduce the exposure of children to lead dust by as much as 99%. Reducing track-in and vacuuming to remove dust deep in the carpet may also lower household levels of dust mites, allergens, pesticides, and carcinogens in house dust. These actions require time and effort, but they are inexpensive and under the control of the family.

Removing Lead-based Paint

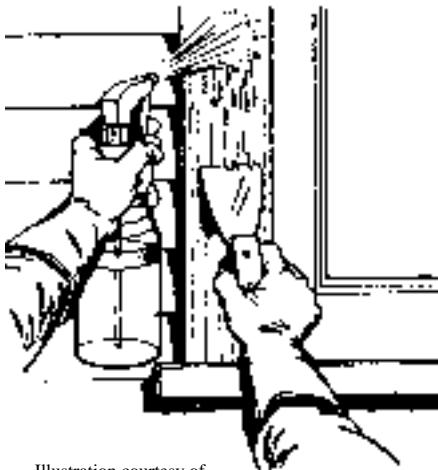


Illustration courtesy of
Minnesota Department of Health Lead Program

Dampen the surface with water, then scrape. Wear a high-quality, two-strap face mask or dust mask. Catch dust and paint chips on a plastic drop cloth. Clean up with a good detergent.

How Good is Your Vacuum Cleaner?

Not all vacuum cleaners are effective at removing dust. A vacuum with an agitator may pick up 2 to 6 times as much dust from a rug as a canister vacuum. Level loop carpets are easier to clean and last longer than plush rugs. Flat rugs and bare floors are the easiest to clean. It is estimated that one in four homes has an ineffective vacuum cleaner and difficult to clean carpets, a vacuum with a loose belt or full bag, no vacuum cleaner at all, or a vacuum which is used less than once a month. Any of these factors may cause high lead levels in rugs. Deep dust will tend to accumulate in nearly all carpets even with regular vacuuming unless the vacuum has a dust sensor to detect when the carpet is clean.

The amount of dust and lead in a rug can be 400 times that found on a bare floor in the same home. The lead concentration in fine soil near the foundation of older houses averages around twice that found in dust inside the house. This demonstrates the importance of reducing track-in.

Remodeling and Paint Removal

Do-it-yourself remodeling or paint removal can drastically increase lead levels. Heating or sanding the paint on the inside or outside of a house can seriously endanger adults, children and pets that live there. Normal cleaning during and after remodeling is not adequate to protect a child or a pet from the lead. It requires extensive training to prevent contamination of all the rugs, curtains, and surfaces in a house. Most do-it-yourself remodelers do not allow enough time for cleaning up dust. Toddlers and pregnant women should remain out of older homes during paint removal and remodeling. There are some other precautions you should take before and during remodeling to keep lead levels as low as possible, especially if it is impossible for toddlers and mothers to be away.

The Environmental Protection Agency (EPA) strongly recommends that you not

undertake do-it-yourself remodeling in a home that contains lead unless you are trained to do so. A brief description of how to protect from lead in remodeling follows. The purpose of this description is to show how difficult lead-safe remodeling is rather than to present step by step directions. What is presented here is not enough information on which to proceed with remodeling! If you are considering the possibility of doing this work yourself, call EPA at 800-424-LEAD for more information. If you hire a contractor to renovate a pre-1950 home that contains lead, they should give you a copy of EPA's booklet entitled *Protecting you Family from Lead in Your Home*. (This booklet is also available on the Internet at <http://www.hud.gov/lea/leadhelp.html>.)

Make certain that you or the contractor you hire is trained in lead abatement. Remove rugs, furniture, and curtains before working in rooms. Carpets which cannot be removed should be covered with a non-skid tarp and sealed with duct tape at the edges. Seal off the work area as much as possible, and avoid tracking dust from the remodeled area.

Use a high quality face or dust mask and a water spray bottle when doing spot sanding or removing old or peeling paint. Wet down loose paint before scraping or sanding inside or outside the house (see illustration inside). Collect the dust on a plastic sheet spread out below the work area. Clean up dust at the end of each working day using a vacuum with a HEPA filter. A high phosphate detergent like trisodium phosphate (TSP) is required to remove lead from a surface. Prevent the track-in of foundation soil disturbed by remodeling. Testing is required to determine if a home is safe after remodeling or removal of paint.

In Conclusion

It takes sustained commitment and action to reduce dust and lead levels in the home, but it is well worth doing. After removing all the deep dust in the carpet and a few weeks of removing shoes at the door or using a walk-off mat, you will notice a marked reduction in dust levels on surfaces in the house. The steps listed in the box at the right can help to protect your child, family, and pets. ■

The Washington Toxics Coalition is a non-profit organization dedicated to protecting public health and the environment by identifying and promoting alternatives to toxic chemicals. Please write or phone for information: WTC, 4649 Sunnyside Ave N, Suite 540, Seattle, WA 98103. Phone: 206-632-1545. Visit our Internet Web site at www.watoxics.org.

What You Can Do

- ❖ Buy, rent, or borrow a vacuum with a power head (and preferably a dust sensor) if you do not have one.
- ❖ Vacuum rugs and mats, and damp mop floors once a week (twice a week if there are toddlers in the home).
- ❖ Vacuum the carpet until the dust sensor light turns green. If you don't have a dust sensor, go over each section of carpet at least eight times.
- ❖ Inspect the vacuum belt and bag monthly. Change bag when it is half full.
- ❖ Select easy to clean floor coverings.
- ❖ Wash window wells, toys, and surfaces people touch once a month (including inside the family car).
- ❖ Remove shoes at the door or use a commercial-quality door mat to reduce track-in. Wipe your feet at least twice on the door mat.
- ❖ Cover the soil next to the foundation with 3 inches of clean dirt every 30 years.
- ❖ Keep toddlers away from remodeling areas, peeling paint, foundation soil, and window wells.
- ❖ Keep toddlers supplied with clean pacifiers.
- ❖ Lay down a clean sheet before putting a baby on a carpet.
- ❖ Ensure that children wash before they eat. Wash toddler's hands often.
- ❖ Protect food from settled dust by covering and/or washing.
- ❖ When remodeling, seal off the work area and avoid tracking dust from remodeled area.
- ❖ Clean air ducts once a year.
- ❖ Do a home environmental audit before you buy or rent a home or have a baby. In the King County area, contact the Master Home Environmentalist Program at 206-441-5100.
- ❖ For information on cleaning up or testing for lead, call the Washington State Department of Health (888-586-9427) or your local health department. In King County call the Hazards Line at 206-296-4692 or 888-TOXIC-ED.
- ❖ Contact EPA at 800-424-LEAD for more information on lead hazards in the home.

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