

# **Why Realtors and Property Managers should understand lead.**

Lead Disclosure rules are in place and filling out disclosure forms is an expected part of the process of writing up a contract on a house. More often than not, the owner of a pre-1978 home will say he/she has no knowledge of the existence of lead-based paint in the home and rarely will a buyer pay the \$400-\$800 cost for a lead inspection or risk assessment. Since lead isn't visible, many people don't understand lead, and most don't really want to deal with yet another issue, it is often ignored. My challenge to you is to not ignore lead, but to talk about it knowledgeably and honestly with your clients.

Knowing there is lead in a home doesn't have to kill a sale or a rental deal but in some cases it may. If you understand what truly constitutes a hazard and you can give factual, practical information to your client, everyone will be the healthier for the effort. People have the right to know about lead but are often uneducated about its implications.

Lead is a toxic metal and a probable carcinogen. There is no safe amount of lead in the human or animal body. The Center for Disease Control states that lead poisoning is still the number one environmental disease for children in the United States, even though lead poisoning is completely preventable.

## **Lead in our bodies**

For adults, lead most often enters our bodies through the inhalation of lead dust or fumes during renovation projects, our jobs, or hobbies. For children, their natural hand-to-mouth behavior and pica behavior (eating substances that are not normally eaten like soil or paint chips) makes them especially vulnerable to lead ingestion. Children most often ingest lead, lead dust, or paint chips that they encounter on floors, window sills and troughs, in soil, and in products that contain lead.

Once in our bodies, lead is mostly stored in bones (70% for children to 90% for adults) and the remainder is stored in blood and kidneys. Some is excreted through the gastrointestinal tract (poop) or kidneys (pee). The half-life for lead in blood and kidneys is ~1 month however in bones it is ~25 years. Lead stored in bones may be released back into our blood stream during pregnancy, times of stress or illness, if a bone is broken, and in old age when our bones begin to break down. Lead has been shown to contribute to stillbirths, premature births, and low birth weights for babies. Many conditions that we now attribute to aging, such as high blood pressure, cataracts, dementia, and impaired kidney function have been linked to elevated lead concentrations. Between 1999-2002, the highest concentrations of lead in blood were found in children aged 1-5 years and in adults over 60.

The three systems most affected by lead in our bodies are the nervous system made up of the central nervous system (brain and spinal cord) and peripheral nervous system (nerve fibers), the cardiovascular system (heart, blood, and vessels) including the blood forming system, and the kidneys.

## **Blood Test**

The most widely-used method of determining lead concentrations in our bodies is a blood analysis. Blood can be taken from a finger or vein. All children should be screened for lead at ages 1 and 2 and each year up to age 6 if any risk factors exist, such as living in a home built before 1950 or in a pre-1978 home that has undergone recent renovations. Lead screenings are free at the local health departments in Buncombe and Henderson counties for children 6 and under and for pregnant moms at risk, no appointment necessary. Currently only ~30% of children are being screened at ages 1 and 2 in Buncombe and Henderson counties.

Hair analysis may give be a better indicator of long-term exposure for adults. Unfortunately, tools for measuring lead in bone are not on the market yet.

Levels of lead in blood are measured in micrograms per deciliter (ug/dl). Although the level of concern is 10 ug/dl, much scientific evidence shows that low levels of lead, <10 ug/dl, can affect a child's IQ and behavior.

## **Acute lead poisoning**

Acute poisoning happens due to a high intake of lead over a short amount of time such as someone sanding large surfaces of lead-based paint without a respirator.

Symptoms may be abdominal pain (often severe) and constipation or diarrhea. Because it affects the nervous system, other symptoms may include irritability, fatigue, weakness, muscle pain, headache, or confusion. In severe cases lead causes swelling of the brain which produces symptoms such as vomiting, restlessness, tremors, and progressive drowsiness. Because lead affects the formation of red blood cells, anemia is another symptom.

Health effects in severe cases include renal failure, convulsions, coma, or death.

## **Chronic lead poisoning**

Chronic poisoning is accumulated small to medium exposures over time.

Symptoms may not be present and if they are present, may seem unnoteworthy since they include common complaints such as irritability, stomach ache, headache, decreased appetite, diarrhea or constipation.

Long-term health effects include impaired blood formation, nervous system damage, high blood pressure, reproductive system damage including low sex drive and fertility problems, kidney dysfunction, hearing loss, and damage to a developing fetus.

Behavioral effects, due to affects on the nervous system, may include:

Learning disabilities like Attention Deficit Disorder (ADD)

Memory loss

Decreased IQ and poor performance in school

Difficulty understanding directions

Reduced eye-hand coordination

Hyperactivity

Aggression

Delinquency or anti-social behavior

## **Who is most vulnerable?**

1. Children under 6 years old

- More likely to ingest lead through normal mouthing behavior
- They absorb more lead from the gastrointestinal tract than adults
- Their nervous system is still developing and is more vulnerable to toxicity of lead than the mature brain

2. Fetuses

Pregnant woman who are exposed to lead while pregnant can pass lead in the blood through the placenta

Pregnant woman who were exposed to lead as a child have lead stored in bones. During pregnancy, lead is released from bones, along with calcium, and is passed to the fetus.

Breast milk of lead-exposed women may also contain high levels of lead.

Exposure during development of a fetus can result in stillbirths, premature births, low birth weight, and can affect a child's intellectual growth and behavioral and psychological development.

3. Those whose occupations or hobbies expose them to lead

## **When is a home considered “child occupied”?**

If a child aged 6 or less spends at least 3 hours/day or 6 hours/week (combined from at least two visits/week) or 60 hours/year in a home, the location is considered child occupied.

## **Lead in Paint and Dust**

Lead is a metal which is mined from the earth. It is malleable and corrosion resistant. Historically, lead was added to paint as a pigment, to add durability and corrosion control, and as a drying agent. It also made paint more mold and mildew resistant. Although a federal regulation banned lead from residential use in 1978, it still, today, is an ingredient in many products, from industrial and auto body paints to soundproofing and putty to brass and vinyl products (including car keys and miniblinds) to off-road vehicle fuel. That said, dust from lead-based paint is still the main source of lead poisoning for children and adults.

Lead paint was expensive and used sparingly. It is most commonly found on exterior surface, on interior and exterior windows, window troughs, and window frames, doors and door frames, and occasionally bathroom and kitchen walls. These were areas exposed to weather or to moisture that benefited from a more durable paint.

### **Which houses are most likely to have lead-based paint?**

Some of today's house paints still contain small amounts of lead but not enough to meet the definition of lead-based, which is 0.06% lead or more. Lead-based paint was banned from residential use (residential surfaces, toys, and furniture) in 1978. Any house built before 1978 may contain lead-based paint (and some slightly newer homes too, if old paint supplies were used.) That said, those built before 1950 are most likely to contain lead since in the 1950s, titanium dioxide and latex paints became popular and in 1955 the lead industry established a voluntary industrial standard that lowered the amount of lead in paint.

### **Is an intact surface painted with lead-based paint a hazard?**

It depends where this surface is located. In general, if the paint is intact and there is no chipping, peeling, or chalking, it is not a hazard. If it is located such that a child can chew on the surface, like on a window sill, than can be a hazard. If it is located on a friction or impact surface – a place where two components rub together like on windows or doors, or a place that gets foot traffic like stair treads – than it may be a hazard because lead dust can be produced. Lead particles are extremely small and can easily be spread around a home.

Another way an intact surface can become a hazard is if someone cuts through or demolishes the surface. Any activity that disturbs the paint can create a lead dust hazard.

### **What to do about Lead Paint**

To learn where lead-based paint exists in a home, hire a certified lead inspector. That person will conduct a surface-by-surface investigation of every component in every room and submit a final report. To learn about lead hazards and possible actions to reduce those hazards, hire a Risk Assessor. This person will test only those surfaces deemed to be a potential hazard and will include suggestions for repair and maintenance in the final report.

If you live in Buncombe or Henderson county and own or rent a pre-1978 house where children aged 6 or less reside or where a pregnant woman resides, UNCA's Lead Poisoning Prevention Program (LPPP) offers a free limited inspection for lead in paint, soil, water, and dust. In return, the parent must agree to have children tested for lead (free at the Health Department.) Call LPPP at 251-6104 for an appointment.

Removing lead-based paint is very costly and work intensive. Paint removal is considered an abatement technique since it considered a permanent solution but there are effective, inexpensive measures, termed *interim controls*, that can reduce hazards.

**Abatement** must be done by a certified abatement contractor. The only exception to this rule is when a person owns and lives in the home to be abated. If only the immediate family is in the home and there are no children with elevated blood-lead levels, then the work can be done by the owner, although training is highly recommended. Abatement measures are considered permanent; however permanent is defined as 20 years.

- Removal of the hazard – i.e. strip paint
- Replace component – i.e. windows, doors, siding
- Encapsulate – i.e. cover surface with special encapsulate paint which creates a seal over lead-based paint. Not appropriate for impact surfaces.
- Enclosure – i.e. cover old wood siding with aluminum or vinyl siding; cover original wall with dry wall or paneling
- Soil removal or cover – i.e. remove and replace 6-24” of soil; pave over soil

**Interim controls** are generally inexpensive solutions to lead hazards but require routine maintenance.

Paint stabilization – i.e. repair any chipping surfaces and the underlying cause of the damage (often water damage) and repaint.

Friction and impact surface treatments – i.e. cover window trough with flashing

Dust removal – i.e. wet mop, HEPA vacuum

Soil barrier – i.e. temporary fencing, thorny bushes, vegetation, sod

## **What are some no-nos in working with lead-based paint?**

Uncontrolled hydroblasting

Burning lead-based paint

Abrasion without a HEPA filter

Dry scraping or sanding (except 2” around electrical outlets)

Heat guns over 1100° F

Methylene chloride for stripper

## **Who can do the work**

The Lead-Based Paint Training and Certification Rule/Section 402 requires individuals and firms conducting lead-based paint activities in housing and child-occupied facilities built before 1978 to be certified and follow certain work practice standards. Training programs must be accredited.

The North Carolina Lead-Based Paint Hazard Management Program (LHMP) is administered by Health Hazards Control. They provide lead information and certify firms and individuals conducting lead-based paint management activities. Health Hazards Control accredits training courses, issues permits for lead-based paint abatement projects, inspects lead-based paint abatement projects, and responds to citizens' complaints.

For more information on the management of lead-based paint hazards in North Carolina, contact Health Hazards Control at (919) 707-5950.

## **Lead in Soil and Dust**

Soil can become contaminated with lead through past or present exposure to chipping lead-based paint, leaded gasoline (especially near roadways or old filling stations), car batteries, pesticides, or fall out from factory emissions. Lead contaminated soil is most often found around the roof drip line and near roadways.

Lead-contaminated soil is harmful if ingested by children, brought into a home on shoes or pet fur, or blown into open windows. Vegetable gardens should not be grown in contaminated soil (i.e. next to a house with chipping lead-based paint) since plants can take up lead.

## **What to do about lead in soil**

- Have your soil tested for lead. It is free if children ages 6 or less reside in your home, otherwise it costs \_\_\_\_\_. Call 251-6104 or go to [www.leadtesting.org](http://www.leadtesting.org)
- Cover loose dirt with 4-6" of grass mulch, gravel, or bark or pave with bricks or concrete
- Keep dust levels down – moistening the soil helps
- Remove sources of contamination when possible
- Pick up obvious paint chips
- Fence off contaminated areas
- Keep pets and children away from contaminated areas
- Remove and replace contaminated soil

## **What to do about lead dust**

- Mop frequently
- Wipe down surfaces with a wet rag regularly. Replace rag.
- Wash children's toys often
- Wash pets often
- Leave contaminated work clothes and shoes outside the home; Wash separately from children's clothes.
- Vacuum with a HEPA filtration system vacuum cleaner to capture tiny lead particles.
- Fix doors and windows so that they don't stick. This decreases friction and the production of dust.
- Always use "safe-work practices" when remodeling, renovating, or demolishing surfaces with lead-based paint. Always hire workers who have completed this or other worker safety training.
- If you are in Buncombe or Henderson County and there are children ages 6 or younger in your dwelling, call the Lead Poisoning Prevention Program for a free lead inspection before any renovation project and a clearance test after the project is complete. Call about our next Lead-Safe Work Practices Training or to borrow a HEPA vacuum cleaner. 828-251-6104.

## **Lead in Water**

Lead pipes have been used for plumbing throughout time. Historically, the Romans built their extensive aqueduct systems with lead pipes and the fall of their empire is often attributed to lead poisoning from the resulting water contamination. Interestingly, the word plumber is derived from the Latin word for lead, plumbum.

Houses built before 1986 may have lead pipes, galvanized pipes (which contain lead), or copper pipes soldered with lead. All of these are a source of lead contamination in drinking water. In 1986, the US banned lead from use in new drinking-water-supply pipes and from flux and solder used to join these pipes. (The N.C. Building Code Council banned lead solder in 1985.) Lead-safe pipes are not lead-free - by definition they can contain up to 8% lead. Lead-free solder can contain up to 0.2% lead.

Brass or bronze plumbing fixtures or well pumps are potential source of lead. Chrome-plated faucets, for example, are generally made of brass, which contains 3 to 8 percent lead. Contamination can occur when water comes in contact with these fixtures.

Water that is highly acidic or highly basic is considered corrosive and can dissolve lead from pipes, solder, and fixtures more easily. Hard water, with lots of minerals, can offer some protection as it may cause mineral buildup on the inside of pipes thus reducing the contact of water with the lead.

Most of the lead in drinking water in North Carolina comes from the lead in the plumbing in the house, not from the local treatment plant or well. Because of this, rather than limit the amount of lead which may legally be present in municipally-supplied water, each municipal system must now target high risk households (based on materials used in the delivery system and other factors) and analyze tap water samples from these households for lead. If the lead level exceeds the 15 ppb action level in 10 percent or more of the taps sampled, then these three steps must be initiated by the supplier:

- *Corrosion control* to adjust water pH.
- *Source water treatment* to reduce the amount of lead in the water as it leaves the municipal supply.
- *Public education* to inform customers of the health effects of lead.

Finally, if the above steps do not reduce the lead level at the tap to the 15 ppb action level, then the municipal system must replace lead delivery system components which contribute more than 15 ppb to tap water lead levels. <http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/he395.html>

## What to do about lead in drinking water

- **Filters** can remove lead. Install calcite filters between faucets and any lead service connectors or lead-soldered pipes or install point-of-use filters, like reverse osmosis and distillation units. Make sure these systems are maintained and filters replaced on a regular basis. EPA does NOT recommend activated carbon filters, sand filters, and cartridge or microfilter filters - these do NOT reduce lead levels. When lead is a problem, water softeners should not be connected to pipes leading to drinking water taps.
- **Flush** the water taps or faucets if the water has been sitting in the plumbing lines for more than six hours. The longer that water sits in pipes, the greater the exposure to lead and possible contamination. Before using water for drinking or cooking, run the cold water for up to three minutes, until it feels cold. You should do this for each drinking water faucet. Allowing the water to run 15 seconds more should flush the service connector as well.
- **Use only cold water** for cooking and drinking. Hot water dissolves lead more quickly than cold water. Using cold water is especially important if you are preparing baby formula.
- Use **bottled or distilled water**.
- **Treat well water** to make it less corrosive.
- If you are building a home, state in writing that only **lead-free materials** are to be used for plumbing installation.
- Use **lead-free materials** when repairing plumbing or remodeling. Pex is considered to be inert and the safest on the market.

<http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/he395.html>

## Laws

### NC Residential Agreement Act

The state of NC passed the Residential Agreement Act which states that a property owner or real estate manager must “maintain rental property in a fit and habitable condition.” This language remains undefined.

### NC Preventive Maintenance Program (PMP)

In 1997 North Carolina adopted the Childhood Lead Exposure Control Act which established a voluntary Preventive Maintenance Program to insure safer housing for renters. In return for keeping a lead-safe home, landlords receive liability protection and a state-issued certificate of compliance.

Requirements:

1. On an annual basis, visually inspect the condition of pre-1978 residential rental property, and if needed:
  - Repair and repaint areas of deteriorated paint inside the dwelling and correct the cause of deterioration;
  - Adjust doors and windows to minimize friction that may create lead dust;
  - Use specialized cleaning methods inside the unit to remove lead dust;
  - Make interior surfaces smooth and easy to clean by recoating deteriorated hardwood floors; replacing or recovering worn-out linoleum floors; repairing and repainting inside window sills and capping the window troughs with vinyl or aluminum.

2. For pre-1950's single-family and duplex units, also repair and repaint exterior deteriorated surfaces and correct the cause of deterioration. Areas of bare soil within three feet of the building foundation must also be covered with grass or mulch.
3. Provide occupants with the following information:
  - The EPA pamphlet "Protect you Family from Lead in Your Home";
  - Summaries of any lead inspection reports
4. Encourage you property maintenance staff to attend a lead-safe maintenance class.
5. Verify compliance with the preventive maintenance standard each year by having a certified inspector conduct an inspection and submit a written report to the NC Department of Environment and Natural Resources.

To receive a certificate of compliance, the property owner or managing agent must provide the following:

1. A signed statement from the occupants (if any), saying they received information about lead paint hazards.
2. A written report of the inspection conducted by a certified lead inspector or risk assessor; and
3. The laboratory analysis of lead dust samples.

[http://www.deh.enr.state.nc.us/ehs/Children\\_Health/Lead/NC\\_PMP/What\\_is\\_PMP.pdf](http://www.deh.enr.state.nc.us/ehs/Children_Health/Lead/NC_PMP/What_is_PMP.pdf)

Planning guide available at: [http://www.deh.enr.state.nc.us/ehs/Children\\_Health/PMP\\_Planning\\_Guide-NEW04.pdf#search='nc%20preventive%20maintenance%20program'](http://www.deh.enr.state.nc.us/ehs/Children_Health/PMP_Planning_Guide-NEW04.pdf#search='nc%20preventive%20maintenance%20program')

For more information, contact:

North Carolina Department of Environmental and Natural Resources, Division of Environmental Health  
Children's Environmental Health Branch  
1632 Mail Service Center, Raleigh, NC 27699-1632  
Telephone: (888) 774-0071; Fax: (919) 715-4739

## **Federal Residential Lead-based Paint Hazard Reduction Act**

Title X of the Residential Lead-based Paint Hazard Reduction Act of 1992 includes requirements for disclosure of known lead-based paint or lead-based paint hazards in housing. This act became fully effective in 1996.

1. The seller or landlord must provide the EPA brochure *Protect Your Family from Lead in Your Home* to the buyer or lessee.
2. The seller or landlord must disclose any knowledge of lead-based paint or lead-based paint hazards and provide copies of any related records or reports. Common areas are included in this requirement.
3. The sale or rental contract must include a lead warning statement signed by all
4. Purchaser must be given at least 10 days to conduct (and pay for) a lead inspection or risk assessment.

Exemptions include:

- Target housing (pre-1978) sold at foreclosure
- Zero-bedroom units
- Short-term rentals of 100 days or less
- Housing for the elderly or handicapped unless a child aged 6 or less resides or is expected to reside there
- Housing for lease that has been inspected and found to be lead free.

## **Federal Pre-renovation and Education rule**

A 1999 EPA regulation requires that:

Prior to the start of their project, residential property owners/managers, general or special contractors (painters, plumbers, carpenters, electricians), or anyone working for compensation distribute the EPA pamphlet *Protect Your Family From Lead In Your Home* to owners and occupants of most housing built prior to 1978 in a language they can understand and obtain a signature confirming receipt. If delivered by mail, it must be sent 7

days prior to the start date and a certificate of mailing from the post office can serve as proof. Keep records for 3 years.

Before renovating common areas (e.g., hallways, stair wells) in multi-family housing, renovators must inform building residents about the nature and extent of the planned work and make the pamphlet available in a central location. This should be documented and records kept for 3 years after the completion of the project.

*Renovation* means sanding, scraping, and other surface preparation activities that disrupt an area greater than 2 square feet of paint per component and which generate dust or fumes. The rule applies to most private housing, public housing, federally owned housing, and housing receiving Federal assistance.

Renovation does not include routine maintenance or repair, emergency renovation operations (specifically defined in the rule), work performed on housing for the elderly (unless children live there) or on zero-bedroom units (efficiencies, lofts, and dormitories), and renovation activities that take place in housing that has already been determined by a certified inspector to be lead free.

You can contact the EPA at 1-800-424-LEAD or 404-562-8989.

<http://www.epa.gov/lead/leadrenf.htm>