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Remodeling Nebraska Homes Containing Lead-Based Paint

This NebGuide discusses precautions do-it-yourself home remodelers should take when working with surfaces that may contain lead-based paint. It also addresses the effects of lead poisoning in children and adults and testing surfaces for lead-based paint.

Carroll Welte, Extension Educator

Introduction

All it takes is a trip to one of the discount lumber yards on a Sunday afternoon to realize the huge number of do-it-yourself home remodelers. Books and videos making projects and repairs look simple line the aisles.

Home remodeling isn't simple, though. Before beginning a project one needs to plan. In homes built before 1978, do-it-yourself home remodelers need to consider the possible presence of lead-based paint and take precautions to minimize the risk of lead poisoning for themselves, children, pregnant women and other adults.

Lead-based paint is generally associated with childhood lead poisoning. Small amounts of lead in the body can do serious harm to the developing brain and nervous system of a young child.

Small children are more at risk for lead exposure, because their bodies tend to readily absorb lead. They frequently put hands and other objects in their mouths and they like to play near windows, where lead-based paint often is found.

Each year several hundred children in Nebraska suffer from elevated blood lead levels (667 in 1995, 516 in 1996, and 759 in 1997). Some children require hospitalization for lead poisoning.

The majority of children ingest lead in the form of lead-contaminated household dust. The major source of lead-contaminated household dust is chalking, flaking or peeling lead-based paint.

Cases of adult lead poisoning have also been documented. A major source of lead for adults is from remodeling or renovating old houses. Other sources include:

- working in an industry that uses lead, like radiator repair,
- doing demolition or lead plumbing work, as part of the construction industry,
- hobbies that require materials made with lead, like solder used in making stained glass artwork or gun powder used in reloading bullets,
- refinishing furniture surfaces painted with lead-based paint,
- living in houses with flaking and peeling paint,
- eating foods, generally from foreign countries, packaged in cans soldered or glazed with lead,
- drinking liquids stored in lead crystal decanters or served in lead crystal goblets,
- or using antique dishes or imported dishware.

Because the Consumer Product Safety Commission didn't ban lead-based paint for household use until 1978, the Nebraska Health and Human Services System recommends that do-it-yourself home remodelers assume all homes built before 1978 contain lead-based paint. In these homes, lead-based paint could have been applied in a variety of concentrations, in a variety of areas.

As long as it remains intact and sealed, lead-based paint underneath several layers of non-lead-based paint, should not be a hazard. Subject to deterioration, friction or impact, however, it may pose a risk to occupants of the house.

The friction created from the repeated opening and closing of a window, painted at some time with lead-based paint, may create enough lead contaminated household dust to become a hazard in the home. Lead-contaminated household dust can be created in even the simplest or smallest home remodeling projects, when lead-based paint is disturbed.

In homes built before 1978, lead-based paint frequently is found on window sills and sashes and in window troughs. Prior to 1950, large amounts of lead were included in paints used on kitchen, porch and bathroom walls, doors, windows, and wooden trim. Seventy percent of Nebraska's houses were built prior to 1978. Close to 40 percent were built before 1950.

The key to managing a lead safe home is to prevent lead-contaminated household dust. Areas where paint is deteriorating, need to be repaired and maintained. Damp cleaning regularly will keep dust levels low. All lead hazards or sources of lead contaminated household dust need to be tested periodically and monitored.

Symptoms and Effects of Lead Poisoning

Usually there are no visible symptoms of lead poisoning for either children or adults.

Low levels of lead in the blood of a pregnant woman can affect the developing fetus. Lead poisoning in a child can lower an IQ, as well as cause learning disabilities such as Attention Deficit Disorder and hyperactivity. Other effects in children that begin with low blood lead levels include anemia, decreased growth, impaired hearing and an inability to maintain a steady posture. At very high levels in children, lead poisoning can cause coma, convulsions and even death.

High blood-lead levels in adults may increase blood pressure, and decrease hearing, coordination and the formation of blood cells. An adult's ability to learn also may be impaired. The kidneys, digestive systems and reproductive organs of adults also can be affected by high blood lead levels. An adult may suffer from anemia, abdominal discomfort, colic, constipation, excessive tiredness, fine tremors, headache, loss of appetite, muscle and joint pain, pallor, sexual impotence, weakness and an inability to

keep hand and arm fully extended.

Testing for Lead-Based Paint

If do-it-yourself home remodelers do not want to assume that planned work areas or homes built before 1978 contain lead-based paint and take precautions to minimize the risk of lead poisoning, they need to test for lead-based paint before starting to remodel. While there are three methods to determine the presence of lead-based paint, testing and evaluation of an entire house should be done by a trained professional.

The most accurate way to test surfaces for lead is to take paint chips from a variety of locations throughout the planned work area and send them to a lab to be analyzed. Since testing labs generally charge \$5-\$15 per sample, this method can be expensive. This method also damages the surfaces being tested.

To do a paint chip test on a surface, locate an inconspicuous area, 2" x 2". With a sharp chisel, cut and remove all the paint (down to the unpainted surface) and put it in a small plastic bag. Seal the bag and label according to instructions provided by the testing lab. Collect and label samples from a variety of surfaces in a variety of locations throughout the planned work area. Laboratories that analyze paint chip samples include:

Midwest Laboratories, Inc.
13611 B Street
Omaha, Nebraska 68144-3693
(402) 334-7770

EMC Laboratories
7342 East Thomas Road
Scottsdale, AZ 85251-7216
(800) 362-3373, (602) 990-2069

EMSL Analytical, Inc.
212 South Wagner Road
6330 East 75th Street, Suite 152
Indianapolis, IN 46250
(317) 570-5892

While anything over 0.5 percent - 500 micrograms per gram, 500 milligrams per kilogram or 5,000 parts per million by weight, meets the federal definition of lead-based paint, precautions should be taken when repairing, renovating or removing surfaces where any lead is detected.

Another method to test for lead-based paint is an X-ray fluorescence detector (XRF). When held up to a painted surface, it determines how much lead is present through all layers of paint. It indicates the number of milligrams of lead per square centimeter. One disadvantage of the XRF test is that it must be done by licensed lead inspectors, most of whom are in Omaha and Lincoln. Lead inspection of an entire house, using an X-ray fluorescence detector, costs between \$200 and \$300.

Chemical tests can be purchased from hardware stores. While this is the least costly method, it is also less reliable. Some tests may indicate there is lead paint, when there really is none.

For more information about testing for lead-based paint, contact your local extension office.

Recommended Practices When Making Repairs or Remodeling

It is important that do-it-yourself home remodelers *never sand, dry scrape or burn off paint in homes built before 1978*. Using chemical strippers with methylene chloride also is not recommended. A heat gun can be used, as long as the temperature is kept below 700° F.

The project should create as little dust as possible and any dust created should be contained. Windows and doors should remain closed at all times. Plastic should be draped over open doorways. Heating and air conditioning vents should also be closed and sealed off with plastic.

Work surfaces must be continuously misted with water throughout the remodeling project or when making repairs. If removing surfaces, like windows, the remodeler should mist the painted joints and then cut with a utility knife.

As remodeling progresses, each work area should be cleaned up before beginning work in a new area.

Regardless of the type of remodeling, all children and pregnant women should be kept out of the work area. No food or drink should be eaten in the work area.

Do-it-yourself home remodelers should wear long-sleeved shirts and pants when working in areas that include lead hazards. Their clothes should be laundered separately and not mixed with other family members' clothes. To reduce inhalation of lead dust, workers should wear approved masks.

Because lead-contaminated household dust and lead-based paint chips are sticky, a thorough cleanup of the work area is necessary.

For specific procedures to follow when remodeling homes built before 1978 that may contain lead-based paint, refer to *Table I*.

Dust Wipe Sampling

Before and after a remodeling project that creates a visible amount of dust, the do-it-yourself home remodeler may want to do dust wipe sampling. This only establishes whether there is lead-contaminated household dust present - not lead-based paint. The lead in the dust may come from a source outside the home, such as in the soil around the house or tracked in from the workplace.

A pre-test determines if a lead-contaminated household dust hazard exists prior to remodeling. It establishes a basis of comparison for the post-test, taken after the remodeling job is completed and work area thoroughly cleaned up.

Before collecting samples, contact the testing lab that will analyze the samples. Request forms and get information about specific procedures to follow. The labs identified on the preceding page also analyze dust wipe samples.

In rooms children spend much time in, samples should be taken from window sashes, sills and troughs, floors and walls. Samples also should be taken in the area to be remodeled or repaired, and where there is deteriorating paint.

Dust wipe samples are taken with baby wipes. Those that come out of the top of a container and contain no alcohol or aloe are recommended.

Because the first baby wipe in the container may be dried out or dirty, pull a fresh one out. Using a back-and-forth motion and working from left to right, wipe the surface that's being tested. When testing walls and floors, wipe an area 12" x 12." When testing a window, wipe the entire surface. Fold the wipe, dirty side in and wipe the surface again from right to left.

Place the wipe in a plastic bag. With a permanent marker, record on the bag the name of the surface the sample was taken from, the dimensions of the surface area, and the room the surface is in. After all the samples have been taken, fill out any forms provided by the testing lab. Mail forms and samples to the lab.

The test results that come back from the lab should be compared to clearance levels established by the U.S. Department of Housing and Urban Development. Results should be less than 100 micrograms of lead per square foot for floors; 500 micrograms per square foot for window sills; and 800 micrograms per square foot for window troughs.

If results indicate levels slightly above these, the work area should also be thoroughly cleaned again, following the guidelines in *Table I*.

Table I. Remodeling guidelines for homes built prior to 1978 that contain or possibly contain lead-based paint.

	Low Risk	Moderate Risk	High Risk
Kinds of remodeling projects	Remodeling that creates very little dust or dust that is barely visible. Includes spot painting or wall repair of a few square feet on surfaces in good condition; repairing a window or rehanging a door in good condition.	Remodeling that contains debris, paint chips and dust that is clearly visible. Dust and debris will not spread beyond a small area. Includes sawing with manual and power tools, undercutting, routing or planing one or two painted wood doors, prying open painted surfaces and drilling large holes.	Remodeling that generates a substantial amount of dust and debris. Includes tearing out a plaster wall, door and window jambs, and casings; scraping peeling or flaking paint from large areas or several rooms; removing wood paneling, drywall, or wallpaper from lead-painted walls; removing carpeting from lead-painted floors.
Recommended Protection for Workers	Properly fitted dust mask, disposable shoe coverings or old shoes that can be thrown away.	NIOSH approved dust mask (e.g. half or full face mask with HEPA or P100 filters), shoe coverings, disposable gloves, long sleeved shirt and slacks.	Properly fitted respirators with HEPA filters; disposable coveralls, shoe coverings, gloves; a painter's cap or hood; and safety glasses.
Recommended Preparation	Close off the work area. Children and pregnant women should not be allowed unprotected adults should not be	Close off work area. Children and allowed near the work area. Remove furnishings. Place 6 mil plastic drop cloth on floor	Remove furnishings. With duct tape, attach plastic to the entrance of the work area. Slash middle; overlap with another sheet of

	<p>near the area until the project is completed and the area has been thoroughly cleaned up. Place a 6 mil polyethylene drop cloth on the floor under the immediate work area. Tape to baseboard with duct tape. Keep the work surface wet at all times using a mister or garden sprayer (new – never used with pesticides).</p>	<p>extending 5' in all directions of the work area. Turn drop cloth up baseboard and tape with duct tape. Keep the work surface wet at all times, using a mister or garden sprayer (new – never been used with pesticides).</p>	<p>plastic attached to doorway. Post sign indicating lead hazard. Do not allow children and unprotected adults to enter. Place 6 mil plastic drop cloth on floor extending 10' in all directions of the work area or cover entire floor. Turn up along baseboard and tape with duct tape. Keep the work surface wet at all times, using a mister or garden sprayer (see Low Risk).</p>
Recommended Hygiene for Workers	<p>Take off shoes or booties before leaving the drop cloth to avoid tracking debris and dust off the drop cloth. Shower or wash hands and face before leaving work area. Wash clothes separately - not with other family members' clothes.</p>	<p>Take off shoes or booties before leaving the drop cloth to avoid tracking debris and dust off the drop cloth. Change or vacuum clothes before leaving work area; shower, wash hands and face thoroughly. Wash clothes separately.</p>	<p>Before leaving the drop cloth take off disposable clothes. Wash hands and face. Wipe down exterior of respirator and remove. After cleaning up the work area, vacuum work clothes with HEPA vacuum. Shower. Wash clothes separately.</p>
Cleanup	<p>Wipe down work area with paper towels or cloths treated with a cleaning solution of all-purpose cleaner and water. Rinse with clean cloths or paper towels. Wipe down and rinse drop cloth and tools. Put all the dirty cloths and/or paper towels in a garbage bag and dispose of properly.</p>	<p>Cleaning the work area – dip a mop into a bucket of cleaning solution; wring out in mop bucket; mop small sections until mop is dry; dip mop in rinse bucket containing clean water; wring in mop bucket and continue cleaning. Rinsing the work area – dip mop in clean rinse bucket; wring in mop bucket; mop small sections until mop is dry; dip mop in dirty rinse bucket; wring in mop bucket; continue to rinse. Change rinse water often. Roll drop cloth inward and place in garbage bag along with cloths or paper towels, and any other debris.</p>	<p>With wet cloths pick up all debris and place in a garbage bag. HEPA vacuum the work area and drop cloths. Following the same guidelines under Moderate Risk, wipe down and rinse the work area. Wipe down all tools and equipment. Move these away from work area. Roll drop cloths inward and place in garbage bags along with other debris. Remove "flap" covers from entrance and place in garbage bags. HEPA vacuum area under drop cloths. Following the guidelines under Low Risk, mop the work area. Dispose of garbage bags properly. Dispose of properly.</p>
Dust Wipe	Not required for re-	Not required for re-	Suggested before

Tests	occupancy.	occupancy.	renovation and before re-occupancy.
During any remodeling project do not eat, drink, smoke or apply cosmetics in the work area.			

Protecting Children from Lead

According to the Nebraska Health and Human Services System, *all children under 6 years old, living in homes built before 1950, should be tested for elevated blood lead levels.* (Refer to NebGuide G98-1378, *Testing Nebraska's Young Children for Lead.*)

The Childhood Lead Poisoning Prevention Program, administered by the Nebraska Health and Human Services System (HHS), has successfully helped to lower many children's blood lead levels through education on lead hazards and prevention. For parents of children with elevated blood lead levels, they provide education and lead risk assessments of homes. When lead hazards are identified, HHS staff work with parents to remedy lead hazards to make the child's environment safer.

For more information about lead sources and lead poisoning, contact your local extension office, county health department or staff working with the:

Childhood Lead Poisoning Prevention Program
Nebraska Health and Human Services System
Department of Regulation and Licensure
301 Centennial Mall South
P.O. Box 95007
Lincoln, NE 68509-5007
(402) 471-7764 or toll free, (888) 242-1100

Summary

Because of risks associated with lead exposure and lead poisoning for children and adults, it is important to maintain a lead-safe home. Seventy percent of Nebraska's houses were built before 1978. Do-it-yourself home remodelers should assume these homes contain lead-based paint. When making home repairs, recommended guidelines for preparation of the work area, worker protection and hygiene, as well as cleanup should be followed explicitly.

Author's Note: The testing labs identified in this publication are examples only; others are available. Any testing lab performing analysis for lead should be NLLAP certified. University of Nebraska Cooperative Extension does not recommend or endorse specific testing labs.

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