



Module 1

Why Should I Be Concerned About Lead Dust?

9/30/2000

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Module 1 Overview

- Exercise
- Why is lead-contaminated dust a problem?
- Health risks and effects of lead?
- What is lead-based paint?
- How many homes contain lead-based paint?
- What the government is doing about lead-based paint?
- Summary

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Upon completion of this module, you will be able to explain

- Why we are concerned with lead-contaminated dust
- The health risks of lead to children and adults
- The federal regulations that affect lead-based paint

MODULE 1 EXERCISE

Objective: Identify common work practices that produce a lot of dust and debris.

Length: Total Time: 20 minutes.

Directions: In groups of 3 to 5 take 10 minutes to answer the questions below. Assign one person to report your group's answers to the rest of the class.

1. Rank the work practice descriptions according to the amount of dust and paint chips you think they make. In the table below, under the column labeled Rank, write:
 - 1 next to the work practice that makes the most dust and debris.
 - 2 next to the work practice that makes the second most amount of dust and debris.
 - 3 next to the work practice that makes the third most amount of dust and debris.
 - Continue until you have ranked each work practice according to how much dust and debris you think it will make. A smaller number means that you think the work practice will create more dust or debris than a larger number.

If you think that some work practices make about the same amount of dust or debris you can give them the same rank. If you think that each practice makes different amounts of dust, rank them from 1 to 7. If you think you need more detail to make a decision, just make that detail part of your assumptions and be sure to note that assumption when explaining your ranking.

Work Practice Description	Rank
A. Using a power sander with no vacuum attachment to remove interior paint from a plaster wall.	
B. Hand sanding a small (less than 2 square feet) area for surface preparation on an interior room where the paint is in good condition.	
C. Ripping out old kitchen cabinets in a 50 year-old house where the paint on the walls and cabinets is in good condition (e.g., it is not peeling or flaking).	
D. Repairing a sticking window. Loosen the painted sashes, remove inside stop molding, remove top and bottom sash, use a power planer to remove old paint, reglaze and repair the sash as necessary, repair and paint the jamb, reinstall the sash.	
E. Removing old carpeting placed over a hardwood floor in one room.	
F. Demolishing one interior wall using hand or power tools.	
G. High pressure power washing or hydro blasting exterior paint.	

Why Is Dust and Debris a Problem?



- Dust and debris can contain lead
- Lead-contaminated dust and debris is poisonous
- Small amounts of lead-contaminated dust can poison children and adults
 - Children swallow it during ordinary play activities
 - Adults swallow or breathe it during work activities
- Workers can bring lead-contaminated dust home and poison their families

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Dust and debris from renovation, remodeling, and painting jobs in pre-1978 housing may contain lead

- Pre-1978 paint may contain lead.
- Renovation, remodeling, and painting jobs disturb paint that may contain lead.
- Any activity involving surface preparation, such as hand scraping, power sanding, the use of heat guns, and open flame burning, can generate significant amounts of dust. More complicated tasks such as removing building components and demolishing walls also can create a lot of dust.

Renovation, remodeling, or painting jobs that disturb lead-based paint can create a hazardous situation

- If proper precautions are not taken prior to and during jobs that may generate dust, workers, residents, and children may become lead-poisoned.

Workers may bring home lead-contaminated dust

- A worker's family may be most at risk from being exposed to lead-contaminated dust because dust can be tracked home and into vehicles on the worker's clothing and shoes.

Small amounts of lead-contaminated dust can poison

- A tiny amount of lead can be extremely harmful. A lead-contaminated paint chip the size of your fingernail contains enough lead to poison an adult.
- Lead particles are often so small that you cannot see them, and yet you can breathe or swallow them. Smaller dust particles that are inhaled or swallowed are more easily absorbed by the body than larger particles, and can therefore cause poisoning more easily.

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Lead-contaminated dust is dangerous to children and adults

- Lead particles in dust, fumes, or mists may be breathed or swallowed by children, residents, and workers.
- Dust settles on everything, including toys, clothes, hands, faces, work surfaces, and equipment.
- Through normal hand-to-mouth activities, children may swallow or inhale:
 - Dust on their hands, toys, food, or other objects
 - Paint chips
- Adults can swallow or breathe dust during work activities.
 - When workers perform activities such as scraping and sanding by hand or use a power sander or grinding tool, it creates dust. These particles get into the air that they are breathing.
 - If workers eat, drink, smoke, or put anything into their mouths without washing up first, they will be swallowing lead.



Health Risks of Lead

– Very hazardous to children

- Reading and learning difficulties
- Behavioral problems
- Difficulty paying attention and hyperactivity
- May result in seizures, coma, and death

– Hazardous to pregnant women

- Damage to fetus

– Also hazardous to workers and other adults

- Loss of sex drive
- Physical fatigue

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Children, particularly children under six, are most at risk from small amounts of lead

- Children absorb more lead than adults because they are growing. Because children's brains and nervous systems are still developing, lead causes irreversible brain, nervous system, and organ damage. This can lead to:
 - Reading and learning difficulties in school
 - Behavioral problems
 - Difficulty paying attention and hyperactivity
- In some cases, exposure to lead may have devastating health effects including seizures, coma, and death.
- Children are at a greater risk than adults because during normal and frequent playing or hand-to-mouth activity, children may swallow or inhale dust from their hands, toys, food, or other objects.
- **Among adults, pregnant women are especially at risk from exposure to lead**
- Changes in a woman's body during pregnancy may cause lead stored in her bones to be released into her blood.
- Lead can then be passed from the mother to the fetus. Lead poisoning can cause:
 - Miscarriages
 - Premature births
 - Low birth weight

Health effects of lead in adults include

- | | |
|--|---|
| ▪ Loss of sex drive | ▪ Miscarriages in pregnant women |
| ▪ Physical fatigue, lack of coordination, dizziness, muscle or joint aches | ▪ Headaches and memory loss |
| ▪ Kidney damage or failure | ▪ Nausea and stomach aches |
| ▪ Damage to male and female reproductive organs | ▪ Heart disease and high blood pressure |



Lead Poisoning

– Lead poisoning does not always have obvious symptoms

- Symptoms are easily misdiagnosed, thus delaying effective treatment and increasing likelihood of permanent physical and mental damage
- Only sure way to determine lead poisoning is to take a blood lead level (BLL) test.

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Lead poisoning does not always have obvious symptoms

- Lead poisoning often has no obvious symptoms, so symptoms are frequently attributed to other causes.
- Specific symptoms that people with lead exposure sometimes complain of include:
 - Headache
 - Stomach ache
 - Irritability
 - Fatigue
 - Loss of appetite
 - Pain in joints
- Because many symptoms are vague or similar to flu symptoms, parents may not get immediate medical attention for their children. This is critical for young children. The longer lead remains in the body of a young child, the higher the risk of permanent damage.
- The best way to determine if lead is present in the body is by testing a person's blood.

Blood Lead Level (BLL)

- Because lead poisoning does not always have symptoms, the most common way to measure the amount of lead in your blood is the Blood Lead Level (BLL) test. The BLL test:
 - Measures the amount of lead that is circulating in your blood.
 - Tells you about your exposure to lead in the last 2-3 weeks.
 - Does not tell you the total amount of lead in your body.
 - Does not tell you if any long-term damage has occurred.
 - A blood lead level above **10 micrograms per deciliter (Fg/dl)** is not safe for children or for women during pregnancy. The Centers for Disease Control and Prevention consider this to be the "level of concern." A level of 39 F g/dl or less may mean that damage to your body is occurring, even if you have no symptoms. A level of 40 to 49 Fg/dl means that serious health damage may occur. A level of 50 Fg/dl or greater means that severe health damage is likely, may be permanent, and may occur quickly.



What Is Lead-Based Paint?

– Lead-based paint is

- Any paint or surface coating that contains more lead than 0.5% or 5,000 ppm by dry weight or 1.0 mg/cm²
- Some states regulate paint with lower concentrations of lead

– Why was lead used in paint?

- Primary pigment
- Added color
- Durability
- Drying agent

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Lead-Based Paint

- Lead-based paint is any paint or other surface coating that contains lead equal to or greater than than 0.5 percent or 5,000 parts per million by weight or 1.0 milligram per square centimeter (mg/cm²) as measured by laboratory analysis or X-ray fluorescence (XRF).
- Paint with concentrations of lead lower than the standard definition above can still cause health problems.

Some states regulate paint with lower concentrations of lead

- You should check with your state health department to see if the state has requirements that are more stringent than the federal requirements.

Why was lead added to paint?

- Lead was added to paint for color and durability. Lead-based paints stood up to wear and tear, temperature and weather changes, and resisted mold and mildew in moist areas.
- Before the 1950's concentrations of lead in paint were as high as 50 percent by weight. From about 1950 to 1973, the concentration of lead in paint was reduced as other pigment materials became more popular.

Lead-based paint was banned from residential use in 1978

- In 1978 the Consumer Products Safety Commission banned the sale of lead-based paint for residential use. In practice, this means that homes built in 1978 could still have used lead-based paint because existing supplies of paint containing lead would still have been available.



How Widespread is Lead in Housing?

Year House Was Built	Percent of Houses with Lead-Based Paint
Before 1940	87 percent
1940-1959	69 percent
1960-1978	24 percent
All Housing	40 percent

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- **Source of data in table above:** HUD Report on the National Survey of Lead-Based Paint in Housing, 2001.
- Approximately 38 million pre-1978 housing units may contain paint that meets the federal definition of “lead-based paint” (Source: HUD Report on the National Survey of Lead-Based Paint in Housing, 2001.).

Homes built before 1960

- Homes built before 1960 are more likely than homes built after 1960 to contain higher concentrations of lead and to have deteriorated paint surfaces. In the 1950’s paint companies began to use less lead.

Homes built in 1978 and earlier

- Play it safe. You should assume that any house built in 1978 or earlier contains lead-based paint unless the house has been tested for lead and the results indicate that the house does not contain lead-based paint.



What Is Being Done About Lead?

– Laws

- Lead-based paint was banned from residential use in 1978
- Title X (“ten”)

– Education

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Title X

- The Residential Lead-Based Paint Hazard Reduction Act of 1992 (PL 102-550, October 28, 1992) is also known as “Title X of the Housing and Community Development Act of 1992.”
- The key provisions in Title X that affect remodelers and renovators are Section 1031 and the amendments impacting the Toxic Substance Control Act (TSCA), Title IV Sections 402 and 406. Key provisions that affect Federally-assisted housing are in Sections 1012 and 1013.
- Title X is the cornerstone of the national lead program. Most lead regulations issued by federal agencies were developed based on direction found in Title X.

Purpose of Title X

- **Develop a national strategy** to eliminate lead-based paint hazards and to evaluate and reduce lead-based paint hazards on a priority basis. To summarize, some of the key features of Title X are that it:
 - Emphasizes the prevention of lead-based paint hazards **before** children are poisoned;
 - Shifts focus away from abating intact lead-based paint to controlling lead-based paint hazards and allows for new technology for evaluating and reducing those hazards;
 - Redefines the concept of lead-based paint hazards to include lead-contaminated dust and soil;
 - Acknowledges that some lead-based paint hazards are of more immediate concern than others; and
 - Recognizes that resources are limited and allows for the tailoring of lead-based paint hazard programs to fit the financial and environmental conditions of specific properties.
- Reduce and prevent childhood lead poisoning.
- Ensure that dealing with lead-based paint hazards are integrated into government housing policies.

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Education

- Training courses like this one inform housing providers and renovation, remodeling, and painting contractors about the potential dangers of lead-based paint and how to prevent potential problems. Over time, contractors, real estate agents, and public health departments will educate homeowners. EPA and HUD offer outreach materials and training courses over the Internet on aspects of lead-based paint --see the web addresses on page 1-15.
- The Centers for Disease Control (CDC), an agency of the Department of Health and Human Services, is responsible for promoting health and quality of life by preventing and controlling disease, injury, and disability. CDC first published guidance on the prevention of childhood lead poisoning in 1975. CDC issued updates to these guidelines in 1978, 1985, and 1991. The current guidance is entitled, "Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials." The guidance makes recommendations to improve the effectiveness of lead screening. Other audiences include public health agencies, health care organizations including managed-care organizations, pediatricians, and other providers of health care to children. CDC guidelines and materials can be obtained on the Internet (www.cdc.gov) or by contacting 800 / 311-3435.
- State and local health departments and other agencies also provide information about lead.



What Is Being Done About Lead?

- **Regulations affecting renovation, remodeling, and painting**
 - EPA: Contractors distribute lead information pamphlet
 - OSHA: Worker protection standards
- **Other environmental regulations**
 - RCRA
 - Clean Water Act
- **Regulations affecting Federally-assisted housing**
 - HUD: 1012/1013 rule

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EPA Regulations Under Title X

- Title X amended the Toxic Substances Control Act (TSCA), which is the primary statutory authority under which EPA issues regulations on working with lead-based paint.
- **TSCA Title IV, Section 402(c).** Section 402(c) requires EPA to **(1) develop and issue guidelines** for the conduct of renovation and remodeling activities which may create a risk of exposure to dangerous levels of lead; **(2) study** the extent to which people engaged in renovation and remodeling activities are exposed to lead or disturb lead and create a lead-based paint hazard; and **(3) revise regulations** to apply to renovation and remodeling activities that create a lead-based paint hazard.
- **TSCA Title IV, Section 402/404 Rule.** Title X directed EPA to **develop training and certification requirements** for lead professions. In response, EPA developed a rule to establish specific training course content, model curricula, certification requirements, and work practice standards for individuals performing the following disciplines:
 - Inspector
 - Risk Assessor
 - Project Designer
 - Abatement Worker
 - Abatement Supervisor

Individuals performing these activities must be trained in EPA or State accredited training programs and certified. States may also have specific requirements about certification and training of lead professionals, so you may need to contact your State lead certification program regulator.

Minimizing Lead-Based Paint Hazards During Renovation, Remodeling, and Painting

- **TSCA Title IV, Section 406(b).** This section states that those performing renovation or remodeling shall **provide the lead hazard information pamphlet to the owner and occupant** prior to conducting such activity. This requirement applies to renovations of target housing performed for compensation. Following are specific requirements:
 - The pamphlet must be provided no more than 60 days before the start of the activity;
 - The pamphlet must be provided at least seven days before the start of the activity if sending by certified mail;
 - Must obtain written acknowledgement of receipt of the pamphlet from the owner and occupant;
 - Must keep this written acknowledgement for a minimum of three years

This requirement does not apply to:

- Minor repair and maintenance activities that disrupt 2 square ft. or less of painted surface per component;
- Emergency renovation operations. An emergency renovation is an unplanned renovation or activity done in response to a sudden, unexpected event which if not immediately attended to presents a safety or public health hazard or threatens property with significant damage (such as repairing damage caused by a tree falling on a house or repairing a pipe break in an apartment complex);
- Renovations on components which a certified LBP inspector has determined are free of LBP;
- Housing units with no bedrooms (zero-bedroom units);
- Housing designated for the elderly or persons with disabilities unless a child under the age of 6 years resides or is expected to reside in the the unit.

The regulation implementing this requirement was published on June 1, 1998 in the Federal Register and became effective on June 1, 1999. Persons who fail to provide the pamphlet as required may be subject to civil and criminal sanctions. Responsibility for compliance rests with the renovator, who, for this regulation is defined as “any person who performs for compensation a renovation.”

- You can get a free copy of this pamphlet by calling The National Lead Information Center at 1-800-424-LEAD. A camera-ready version is also available on the EPA Website at www.epa.gov/lead.

TSCA Title IV, Section 403 Rule: Dust Lead Sampling Standards

- EPA recommends dust sampling but currently does not require it.
- When conducting dust sampling, the goal should be to adhere to the following standards:
 - Floors 40 Fg/ft² (micrograms per square foot)
 - Interior window sills 250 Fg/ft²
 - Window troughs 400 Fg/ft²

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Regulations Issued Under the Resource Conservation and Recovery Act and the Clean Water Act

- The Resource Conservation and Recovery Act (RCRA) and the Clean Water Act (CWA) may apply to renovation and remodeling work because they regulate waste disposal and discharges of dirty water. This course concentrates on minimizing waste to avoid running into problems with these regulations. This module concentrates on Title X and OSHA regulations because they most directly affect renovation and remodeling activities.
- Most states are authorized by EPA to implement their own regulatory programs under RCRA and CWA. This means that their requirements are at least as stringent as EPA's. As a result, contractors should contact their state environmental agency for guidance on how to manage waste and waste water generated during renovation and remodeling.
- EPA has issued an advisory opinion that waste generated during renovation and remodeling is not considered hazardous and therefore should not be regulated under RCRA. However, a state must adopt this position for it to become effective in that state. Contact your state environmental agency to determine whether it has adopted EPA's advisory opinion. A copy of EPA's interpretation is included in Appendix 6 EPA's Waste Policy Guidance.

OSHA Regulations

- Title X, Section 1031 directed the Occupational Safety and Health Administration (OSHA) to develop standards for occupational exposures to lead in the construction industry. A comprehensive treatment of OSHA regulations requires additional training.
- The major OSHA regulations pertaining to lead are:
 - Lead Exposure in Construction (29 CFR 1926.62);
 - Hazard Communication for Construction (29 CFR 1926.59); and
 - Hazard Communication for General Industry (29 CFR 1910.1200).
- **OSHA Requirements Under Lead Exposure in Construction (29 CFR 1926.62).** While Title X attempts to provide protection to the occupants of target housing, OSHA regulations attempt to provide protection to workers who encounter lead-based paint on any job that involves lead -- not just in pre-1978 target housing. Construction workers may be especially at risk because they create dust and debris that can poison them as well as those with whom they come into contact off the job. This regulation went into effect June 3, 1993. It applies to all workers doing construction work who may be exposed to lead on the job. This specifically includes repair and renovation work.
- **Types of work covered by the OSHA lead exposure in construction rule include:**
 - Demolition or salvaging of structures where lead or materials contain lead. For example, in performing gut rehabilitation of an older home, walls covered with lead-based paint will be demolished and create large amounts of debris.
 - Removal, enclosure or encapsulation of materials containing lead. For example, removing a window creates dust and debris.
 - New construction, alteration, repair or renovation of structures, substrates, or portions thereof, that contain lead or materials containing lead. For example, a structural member that is exposed to weather such as a car port.

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- **Types of work covered by the OSHA lead exposure in construction rule (continued):**
 - Installation of products containing lead. Examples of such products include: using lead-based paint (special industrial applications), lead roofing materials (flashing installation), installation of lead shielding in doctors' offices or in a hospital.
 - Contamination and emergency clean-up.
 - Transportation, disposal, storage, or containment of lead or materials containing lead on the construction site.
 - Maintenance operations associated with the previous activities. For example paint repair, repainting, and cleaning.
- **Employer responsibilities under the OSHA lead exposure in construction rule**
 - Determine if any employee is exposed above the action level (30 Fg /m³) using full-shift personal air sampling.
 - Under 30 Fg /m³ - no special action level (micrograms of lead per cubic meter of air measured inside the worker's breathing zone as 8 hour time weight average).
 - 30 -50 Fg /m³ - requires worker blood lead monitoring and training
 - Over 50 Fg /m³ permissible exposure limit (pel) - requires blood lead monitoring, training, and worker protections such as respiratory protection and protective work clothing.
 - The OSHA regulations contain specific requirements and guidelines covering construction employer and worker safety and responsibilities.
 - A "traffic light" illustration is useful to explain the different levels of protection that take effect for different amounts of dust particles in the air:
 - **Green Light:** Less than 30 Fg /m³. This level requires no special precautions.
 - **Yellow Light:** 30 Fg /m³ to 50 Fg /m³. This level requires protection such as blood tests to monitor lead levels in the blood and training in accordance with the standard for workers. This is the Action Level (AL).
 - **Red Light:** Greater than 50 Fg /m³. This level requires protection such as respirators in addition to protection provided under "Yellow." This is the Permissible Exposure Limit (PEL). Employers must provide appropriate protective clothing and equipment to workers free of charge.
 - If possible, using work practices that keep the level below 30 µg/m³ is best because workers are not required to have special protection or monitoring. Maintaining the required low level of dust particles is possible but you need to prove that it is being maintained by monitoring dust particle levels. You need to know what practices keep dust levels to a minimum.

Additional OSHA Regulations

- **Additional applicable OSHA regulations include:** Respiratory Protection (29 CFR 1910.134); Personal Protective Equipment (29 CFR 1910.132); Sanitation (29 CFR 1926.27).
- Many OSHA regulations have similar requirements:
 - Keep work area clean and free of hazards.
 - Assess the job and protect employees.
 - Use safe work practices.
 - Provide hygiene facilities for washing hands and face, or showering if feasible.
 - Train employees about workplace hazards.
 - Do the job right and keep good records.
 - Provide access to medical and exposure records.

Minimizing Lead-Based Paint Hazards During Renovation, Remodeling, and Painting

HUD Regulations Under Title X

- Title X, Sections 1012 and 1013, required HUD to develop regulations to address lead-based paint in pre-1978 Federally-assisted and Federally-owned housing which is being sold. Housing owned and operated by a Federal agency other than HUD is not covered by this regulation.
- The 1012 / 1013 regulation is called the “Lead Safe Housing Rule” and is found at 24 CFR Part 35.
- Under Title X, HUD has developed
 - Regulations that apply to how contractors and their employees must work with lead-based paint when doing lead hazard reduction or abatement work in pre-1978 HUD-assisted or HUD-owned homes;
 - Regulations affecting training and work practices for operations and maintenance work on housing receiving Federal assistance; and
 - Required training in lead-safety for all workers performing rehabilitation activities in housing units built before 1978.

Lead Information Resources

- **EPA.** On the Internet at www.epa.gov/lead.
- **OSHA.** On the Internet at www.osha-slc.gov/SLTC/lead. Note that this URL is case sensitive (the letters SLTC must be capitalized).
- **HUD.** On the internet at www.hud.gov/offices/lead or by contacting HUD User at 1-800-245-2691.
- **National Lead Information Center** at 1-800-424-LEAD.



Now You Know

- Why we are concerned with lead-contaminated dust
- The health risks of lead to children and adults
- The regulations that affect lead-based paint

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The modules in the rest of the course describe how proper set-up and containment, safe work practices, and clean up techniques leave less lead-contaminated dust and debris than standard renovation, remodeling, and painting work practices.