

LEAD EXPOSURE **IN CONSTRUCTION**

COURSE OUTLINE

- **Lead was one of the first metals ever used by man.**
 - Lead was also the cause of the first recorded occupational disease, "lead colic", suffered by a metal worker who lived about twenty-four hundred years ago.
- **While it has many uses, lead is also "toxic", poisonous to humans, animals and plants.**
 - When it is absorbed into the human body, it usually leads to serious health problems, and it can be fatal.
- **According to OSHA (the Occupational Safety and Health Administration), more than eight hundred thousand workers in the United States may be regularly exposed to lead on the job.**
 - That's why the agency has issued safety standards designed to protect you from lead's harmful effects.
- **Today, the most common way people are exposed to lead is when they breathe in dust and fumes that contain lead while they are at work.**
- **When lead is inhaled it passes through the lungs into the bloodstream, and collects in your bones and tissue.**
 - Lead dust can be accidentally swallowed, as well.
 - Either way, once it has been absorbed by the body lead can remain there for years, and cause serious problems.
- **There are two basic types of lead exposure:**
 - "Long-term"
 - "Acute".
- **In long-term exposure, small amounts of lead build up in the body over a long period of time.**
 - Long-term exposure can cause damage to your brain and nervous system, as well your blood, kidneys and reproductive system.

- **Symptoms of long-term lead exposure include:**
 - Headaches.
 - Joint and muscle pain.
 - Elevated blood pressure.
 - Nausea.
 - Dizziness.
 - A metallic taste in the mouth.
 - Loss of appetite.
 - Fatigue.
 - Constipation.
- **Acute lead exposure occurs when a large amount of lead is absorbed in a short period of time.**
 - In the construction industry, this is the most common type of lead exposure.
- **Symptoms of acute exposure include:**
 - Drowsiness.
 - Memory loss.
 - Tremors.
 - Vomiting.
 - Severe abdominal pain.
- **It can also produce a brain condition called "encephalopathy", which can cause convulsions, coma and death, all in just a matter of days.**
- **Although exposures to deadly amounts of lead are highly unusual these days, they are not impossible.**
 - As a construction worker you may run the risk of serious health effects from acute lead exposure.
 - Federal laws are now on the books that protect you by limiting how much lead you can be exposed to.
- **Chances are you're viewing this program because your job involves some risk of exposure to lead.**

- **This risk is associated with many types of construction activities, including:**
 - Demolition work.
 - Using mortar that contains lead.
 - Abrasive blasting.
 - Welding or cutting old, painted metal.
 - Rivet busting.
 - Manual dry scraping and sanding.
- **To protect workers from the harmful health effects of these types of lead exposures, OSHA issued its Construction Lead Standard, 29 CFR 1926.62.**
 - This regulation sets limits on how much lead employees can be exposed to.
 - It also establishes procedures employers must follow in order to reduce lead exposure on their work sites as much as possible.
- **Before work can start on any project that involves lead, employers are required to develop a written "compliance" program. The program will describe:**
 - All activities that could expose employees to lead.
 - The "compliance methods" the employer will use to control that exposure.
- **There are three general types of compliance methods.**
 - Administrative controls.
 - Engineering controls.
 - Personal protective equipment.
- **Administrative controls include policies and procedures such as:**
 - Safe work practices for housekeeping and decontamination.
 - Employee training.
 - Medical surveillance and removal programs.
- **Engineering controls include physical and mechanical safeguards such as:**
 - Isolation and containment of a lead hazard area.
 - Mechanical ventilation with appropriate filters.
 - Special vacuums for cleanup and decontamination.
- **The third type of compliance method, personal protective equipment, is anything you wear to protect yourself when administrative and engineering controls alone cannot reduce your lead exposure to acceptable levels.**
 - This might include disposable coveralls or other "full body" work clothing, respirators, vented goggles or face shields, gloves, shoe covers, and hats.
 - Whatever is appropriate and necessary for the job you're doing.

- **Another key part of the compliance program is employee training.**
 - This will be provided before you start work on any task that involves exposure to lead.
- **The training will include information about:**
 - The health hazards associated with lead exposure.
 - The requirements in the OSHA Lead Standard for Construction.
 - The contents of your employer's compliance program.
- **You will also learn how to properly use and maintain any PPE that you'll need to wear on the job.**
 - Your employer will make any of this information available to you upon request, as well.
- **Before you begin a new task that could expose you to lead, your employer is required to find out just how much lead exposure the job will involve.**
- **The OSHA Standard sets a threshold exposure limit, called the "action level", at 30 micrograms of lead per cubic meter of air over an 8-hour period.**
 - But the action level's technical details aren't as important as understanding how this benchmark is used in situations where you could be exposed to lead.
- **If your employer's "initial determination" testing shows that airborne lead is below the action level, then no action is required.**
 - Work may proceed without exposure controls, but new tests must be conducted whenever there are any changes in equipment, processes or personnel that might also cause a change in the airborne lead level.
- **If the initial determination shows potential lead exposure is at or above the action level, your employer must do several other things.**
 - More detailed testing will be conducted to determine what the lead exposure levels are for each specific job classification in the work area.
 - You will be informed regarding which specific work activities could expose you to lead.
 - You will immediately receive the lead safety training that we discussed earlier.
- **The action level is also used as a benchmark in the medical surveillance and removal programs that are included in the compliance plan.**

- **The OSHA Standard also sets a maximum daily limit for worker exposure to lead, 50 micrograms of lead per cubic meter of air over an eight-hour shift.**
 - This is called the "permissible exposure limit" ("PEL").
- **As we've seen, some tasks in the construction industry can expose you to a lot of lead in a short time.**
 - That means workers could easily be exposed to dangerous levels of lead even before the first air monitoring test results come back from the lab.
 - So OSHA's Lead Standard for Construction requires employers to provide workers with effective personal protective equipment during this "determination period."
- **To assure that the appropriate amount of protection is provided, OSHA has divided all construction tasks into three categories, based on their potential for airborne lead concentrations.**
 - Each category has its own respirator requirements.
- **In the first category are tasks in which workers have the potential to be exposed up to 10 times lead's PEL.**
- **Where lead-based paint is present, these include:**
 - Manual demolition, scraping and sanding.
 - Heat gun activities.
 - Paint removal using power tools that are equipped with dust collection systems.
- **The second category includes tasks that could expose you to airborne lead at more than 10 times lead's PEL, such as:**
 - Rivet busting.
 - Removing paint with power tools that don't have dust collection systems.
 - Moving abrasive blasting enclosures.
 - Cleanup activities.
- **"Lead burning" and the use of mortar containing lead are also included in this category.**
- **Tasks where airborne lead concentrations can exceed 50 times the PEL fall into the third category.**
 - They include abrasive blasting, welding, cutting, and "torch burning".

- **At any of these exposure levels, your employer will provide you with appropriate personal protective equipment.**
 - These categories are only meant to be used to determine worker protection while you're waiting for the results of initial air monitoring.
 - When the results come in, your employer can change the protection level to suit the actual exposure to airborne lead.
- **If testing shows that the level of airborne lead is below the permissible exposure limit...**
 - Then employees are not required to use personal protective equipment.
 - However, some employers may want their workers to wear PPE anyway, for maximum protection.
- **If the level of airborne lead in the workplace exceeds the PEL, then your employer must use whatever exposure controls are necessary to reduce it to below the limit.**
 - You will be informed as to the steps they are taking.
- **Additionally, air monitoring must be done to track your potential lead exposure on an ongoing basis.**
 - Your employer must inform you in writing of all the monitoring results.
 - Employers must keep records of all other air monitoring results as well, and make them available to you to review if you like.
- **If you will be working in areas on a job site where the airborne lead concentration is above the PEL, your employer must provide you with appropriate personal protective equipment (PPE) to reduce your exposure to acceptable levels.**
 - This equipment must be provided to you at no cost.
 - Your employer is responsible for keeping it clean and functional, and for disposing of it properly when that is necessary.
- **Since respirators are key to preventing you from inhaling airborne lead, your company's compliance plan includes a "respiratory protection program".**
- **This program requires that you be given a suitable respirator in several types of situations, including:**
 - While engineering controls are being set up but are not working yet.
 - Whenever administrative and engineering controls aren't able to reduce lead exposure to below the PEL.
 - Whenever you ask for one.

- **The respiratory protection program also requires that you receive any training you need in order to use your respirator correctly. The training will include:**
 - The proper use and maintenance of the respirator.
 - What type of filter cartridges to use.
 - When and how to replace the cartridges.
- **No respirator can promise you full protection unless it has been "fit tested".**
 - The seal that the respirator makes against your face must be tight.
 - A fit test will make sure no lead dust can "leak" inside, where you can breathe it.
- **If you have any trouble breathing through your respirator during a fit test, a medical examination will be scheduled to make sure you can wear one safely.**
- **If you ever have doubts about whether your respirator fits you or is working correctly, check with your supervisor before you enter a lead hazard area.**
- **The administrative controls that protect you from lead exposure include "standard operating procedures" or "SOPs".**
 - These are guidelines for what you can do to reduce lead exposure hazards.
- **Your employer's compliance program will address using these "work practice controls" in two particular areas, "housekeeping" and "decontamination".**
- **Housekeeping encompasses the cleanup and disposal of lead-contaminated materials.**
 - Its goal is to keep work surfaces free from the buildup of lead dust or other lead residue.
- **Never use compressed air for this!**
 - "Blasting" these substances away will only create more problems, by mixing them into air.
 - Instead you need to use a vacuum cleaner equipped with a "High Efficiency Particulate Air" (HEPA) filter, that will capture the lead contaminants safely.
- **Once contaminants have been caught, you should empty the vacuum cleaner carefully, so you don't spread them back into the work area.**

- **Since cleaning methods like shoveling, sweeping, and brushing are much more likely to stir up lead dust, you should only use them when vacuuming is impossible or impractical.**
- **You should never eat, drink, smoke or apply cosmetics when you're inside an area that is contaminated with lead.**
 - All of these activities can transfer contaminants into your body.
- **Decontamination procedures focus on preventing you from spreading lead to outside the hazard area, via your equipment, clothes or body.**
- **When you break for lunch, or stop work at the end of the day, you need to clean any lead contamination off your protective clothing and equipment.**
 - This should be done in a climate-controlled "changing room" or "decontamination chamber" which is set up for that purpose.
- **Never clean off by blowing, shaking, brushing or doing anything else that will disperse contaminants into the air.**
 - Instead, clean off safely, with a HEPA vacuum.
- **Whenever you are working in lead exposure situations your employer will also have set up a climate-controlled lunchroom or eating area.**
 - It is critical that you decontaminate your work clothing and equipment before you enter these "clean" zones.
 - Thoroughly wash your hands and face as well.
- **Since you will be in a space where you or your coworkers will be eating and drinking, and possibly smoking or applying cosmetics, these precautions reduce the risk of anyone accidentally swallowing any lead contaminants.**
- **At the end of your shift, you should go through the normal decontamination process, then place your equipment and PPE in the appropriate containers for cleaning or disposal.**
- **When possible, your employer will provide shower facilities so that you can wash yourself off completely before changing back into your street clothes.**
 - If there are no showers at your job site, you should wash your hands and face thoroughly before changing, and be sure to shower when you get home.
 - Separate clothing storage lockers in the changing room will prevent any cross-contamination of lead between your PPE and your street clothes.

- **Remember, decontamination helps you avoid exposing your home, friends and loved ones to lead, as well.**
- **Even when your employer's exposure controls are keeping on-the-job lead exposure to below lead's permissible exposure limit, you may still receive a low level of exposure, especially if lead is present above the action level.**
- **That's why OSHA's Lead Standard for Construction requires employers to establish a medical surveillance program for all employees who are exposed at or above the action level for more than 30 days per year.**
 - The program provides free blood tests and medical examinations on an ongoing basis, to monitor your lead exposure and its effect on your health.
- **First, blood samples will be taken to determine your "blood lead level" (BLL) and "zinc protoporphyrin" (ZPP) level.**
 - These will show how much lead exposure, if any, you've already had.
 - They also establish a baseline for later readings, and help to determine what your schedule should be for future blood tests and medical exams.
- **The higher your BLL and ZPP, the more often you'll need to be tested, to make sure you're staying within safe limits.**
 - You will be informed in writing of all your test results.
- **The periodic medical examinations you receive as part of the surveillance program will include a thorough physical evaluation.**
 - The doctor will watch for any changes that indicate you have been overexposed to lead.
- **If you wear a respirator at work, the physician will also check your heart and lungs, to make sure the respirator is not overstressing them.**
- **In addition to your periodic examinations, you will be scheduled for an exam immediately if at any time you show symptoms of lead exposure.**

- **If your medical exams show that you have too much lead in your blood, or your health starts to be affected, you will need to undergo "temporary medical removal".**
 - This means that you are temporarily not permitted to work in areas with airborne lead concentrations above the action level.
 - Instead, your employer will move you to another work area or send you home with pay.
 - The purpose of this "temporary removal" is to allow time for the amount of lead in your body to fall to a safe level.
- **During your "removal", you will receive "Medical Removal Protection" benefits.**
 - Under this program, your employer is required to maintain your wages, benefits, job status and seniority for up to 18 months... just as though you had not been removed.
- **Your employer must also keep records of all of your medical surveillance and removal information, and make them available to you whenever you request it.**

*** * * SUMMARY * * ***

- **Before any work begins that involves possible exposure to lead, your employer is required to develop a written compliance program.**
- **This program will include the use of administrative and engineering controls, as well as personal protective equipment if it is needed**
- **The program will also contain information about the safe work practices that should be used in work areas where lead exposure could occur, including housekeeping and decontamination procedures.**
- **If there is the potential for you to be exposed to lead, your employer will provide the training, equipment and PPE you need to work safely.**
- **If your blood lead level (BLL) gets too high, or your health starts to be affected by lead contamination, you will be temporarily removed from any construction activity that exposes you to lead.**
- **During any temporary removal your pay and other job benefits will be protected while the lead works its way out of your system.**
- **OSHA has set limits and established rules to help keep you safe from lead exposure on the job.**
- **Now that you know the hazards that are associated with lead contamination, and understand how to avoid them, you can get your job done and go home safe... every day!**