



## ***SOUTH CAROLINA FAMILY AND COMMUNITY LEADERS***

Affiliated with National Volunteer Outreach Network, Country Women's Council, U.S.A., Associated Country Women of the World and in partnership with Clemson University Cooperative Extension Service  
SCFCL website: <http://www.scfcl.com>

### **Leader Training Guide**

#### **Title: Lead and Its Effect on Human Health**

#### **Objectives:**

To increase public knowledge of a hidden and often times disregarded health hazard.

#### **Lesson Overview/Introduction:**

What is lead? Where was lead used? What is of major concern with lead today?  
What do I do?

#### **Lesson:**

Lead is a bluish-gray metal mined from the earth. It is a soft metal, easily formed and very long lasting...it will not rust. Its usage dates from the early Roman Empire and the number of items made from or containing lead are countless. The Romans used lead to make aqueducts to bring water from the mountains. They made water storage containers and drinking water goblets from lead. The French made wine in lead vats and then aged it in lead drums saying it gave the wine a sweet taste. George Ravenscroft created lead crystal in his "glasshouse" in 1674 calling it flint glass. Several well known companies produce flint glass or lead crystal as it came to be called. Waterford Crystal, Baccarat, Mikasa, Swarovski and Stueben Glass are examples of companies that make drink ware, jewelry and collectible art from lead crystal. Lead had many other uses such as additives for gasoline, stabilizers for mini blinds, fishing weights, bullets, solder for old tin cans, batteries, seams in stained glass windows and plumbing items. In fact the word plumber comes from the Roman Era as they called lead "plumbum". Most of these uses are items now in history.

Of major concern today is children's exposure to lead based paint. Lead was put into paint to make it brighter, to make it dry faster and to **make it more durable**. It was a good thing for the paint manufacturing industry and was widely advertised as "The Thing" making some brands superior to others. Dutch Boy was the most recognized brand due to their extensive advertising. They promoted their product on slogans like "Painting the House that Jack Built. Don't forget the Children - Some Day They May Be Customers." Almost all Dutch Boy advertising contained pictures of children stating "It makes the children's rooms brighter. It can be washed." Dutch Boy published coloring books promoting lead paint. Little attention was given to many of those children not growing up to be customers. Again, the main reason for lead being added to paint was to make it more durable. Some Dutch Boy paint was actually labeled as "White Lead Paint" with a lead concentration of 100% white lead carbonate.

Historically; most houses were painted with lead based paint; interior and exterior. About 86% of houses built before 1940 were painted with lead based paint. From 1940-1959 the average dropped to 66% and down to 25% for houses built between 1960 and 1978. Currently, the total number of houses with some lead based paint is estimated at 35%.

Is lead a major health issue? Yes, especially with fetuses and children ages 6 and under. The central nervous system is under very rapid development and is the main target for lead poisoning. Other major targets include the brain, blood and kidneys. Symptoms can include loss of appetite, weakness, headache, fatigue, nausea, joint pain, cramps and vomiting, depending on the level and duration of exposure.

What do children of these ages do with toys, fingers and just about anything else they get...lick it, try to eat it or somehow get it to their mouth. The main means of children getting lead poisoning is "Hand to Mouth." This comes from the simplest of things ...not only do children draw on walls with crayons, they chew on them. Guess what was one of the main ingredients for crayons? Yes, lead. Children also like to look out of the window. Their problem was the window-sill was higher than eye level. So what did they do? They grabbed the window sill and pulled themselves up higher in order to see out. Where was their mouth...right there on the window sill. Aside from the lead based paint often found on the window sill there was a good chance of lead dust from the mini blind.

How do you know if your child has lead in their system? Ask their doctor to administer a "Blood Lead Level Exam" on the child's next visit. Blood lead level is the ONLY measure of lead in our body; there are no home or other medical tests available. Many states have mandatory blood lead level testing for children ages 6 and under. South Carolina unfortunately does not. The Center for Disease Control has concern when a child's lead level reaches 5µg/dl (micrograms per deciliter) of blood. What does this mean? You know what a pack of Sweet'N Low® looks like. One pack contains 1 gram of sweetener, which is equal to 1 million micrograms. Play like the content was lead dust...that is 200 thousand times the amount of lead needed to raise health issues. A deciliter is about ½ of a cup.

It is important to know that many children do not show any symptoms or, if they do, the symptoms are similar to other common problems. The child may seem irritable and less inclined to play and even lose their appetite. The child's attention span can be affected, or children have been wrongly diagnosed as having a psychological problem. Because the nervous system is affected, the child may appear clumsy.

What about other people? Lead does not discriminate! Although still serious; the health effects are not as acute for teens and adults. Lead interferes with a variety of body processes and is toxic to many organs and tissues including the heart, blood formation, kidneys, reproductive and nervous systems. In addition to the main targets, lead causes reproductive problems and loss of control of body parts such as foot drop and/or wrist drop. The main means of lead poisoning for adults is inhalation. Most often adults are poisoned from hobbies or work activities. Hobbies associated with

lead poisoning include making stained glass windows, working with pottery and ceramics, hunting and fishing, refinishing furniture, jewelry making and being an artist. Even low-level exposure can impact the nervous system and the brain causing depression, memory loss and forgetfulness. Guess what, ladies...a small amount of lead is in many LIPSTICKS.

When lead enters the body, it migrates to soft tissue including the brain, kidneys and liver first. Does your body eliminate lead? Yes; especially through the kidneys where it causes considerable damage. Lead in our soft tissues has a half-life of 25-30 days. Meaning in that time your body will eliminate ½ of the lead. Great! In another 25-30 days the other half will be gone. NO! In another 25-30 days half of what is left will be eliminated. In other words you will never get rid of all of the lead. Your body loves lead more than it loves calcium. It therefore displaces the calcium in order to absorb lead. If your lead intake is extensive and rapid, the lead migrates to your bones and teeth. The half-life there is 25-30 YEARS!!

How long have we known that lead was a health hazard? The Greek physician Dioscorides made this statement about 200BC: "Lead makes the mind give way". The French stopped using lead in wineries around 1400; European countries banned lead in paint in the late 1800s. The U.S. banned lead in paint in 1978...REALLY? That is what most people think. Lead was banned from paint used in private homes, schools, libraries and hospitals only...it is still widely used in industry. The yellow paint used to divide highways and stripe parking lots contains about 85% lead.

The EPA passed a law regarding lead based paint in April 2010. It is the "Renovation, Repair and Painting Rule". RRP requires that firms performing renovation, repair, and painting projects that disturb lead-based paint in homes, child care facilities and pre-schools built before 1978 be certified by EPA and use certified renovators who are trained by EPA approved training providers to follow lead-safe work practices. Firms/workmen are required to test the painted surfaces to be disturbed for the presence of lead in the paint. Homeowners employing personnel to do RRP activities should ask for training verification. Untrained personnel or persons not following the EPA RRP Rule are subject to fines up to \$37,500 per violation per day. This rule applies to jobs above 6 Ft<sup>2</sup> interior or 20 Ft<sup>2</sup> exterior that disturb the lead based paint. Disturbance is not just working on the paint itself. Deteriorated paint falling from the soffit due to roof replacement would be considered disturbance.

For the work place? OSHA has some very stringent regulations for worker exposure. OSHA tells the employer to take all practical measures to make the job safe before respiratory or other forms of personal protective equipment are issued. Jobs known to generate a lot of dust require respiratory protection. Jobs that produce unpredictable dust levels must be started with respiratory protection until air samples prove protection is not needed. In addition; OSHA requires periodic physical exams including "Blood Lead Level Exams" to ensure worker protection. If blood lead levels rise to a level of concern, the worker must be removed from lead work activity for up to 18 months at the same pay grade until the lead lowers to an acceptable level.

**Lesson Summary:**

- 1) Lead is harmful to all ages. The unborn and young children are the most venerable.
- 2) OSHA regulations are in place for worker protection.
- 3) For all homes and/or child occupied facilities; test the paint for the presence of lead. This may be done by the homeowner or a trained RRP person. There are 3 EPA-recognized test kits. The best one for the homeowner is “Lead Check”. These kits may be purchased from various paint stores, Home Depot and Lowe’s. The kits contain 8 swabs (1 time use only) for about \$25.00. If you do the test yourself, **READ THE DIRECTIONS!!** This test is relatively simple but gives false or misleading information when not done properly. All layers of paint must be exposed to the swab for reliable testing.

**Suggested Activities:**

None

**Suggested Materials:**

None

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**Sources/References:**

EPA RRP and US OSHA