PATIENT EDUCATION HANDOUTS

Lead Poisoning

Topic Overview

What is lead poisoning?

Lead poisoning occurs when you absorb too much lead by breathing or swallowing a substance with lead in it, such as food, dust, paint, or water. Too much lead in the body can cause irreversible problems in growth and development in children, including:

- Behavior problems.
- Hearing problems.
- Learning problems.
- Slowed growth.

In adults, lead poisoning can cause serious health problems, including high blood pressure and damage to the brain, nervous system, stomach, and kidneys.

Although it is not normal to have lead in your body, a small amount is present in most people. Lead can damage almost every organ system, with the most harm caused to the brain, nervous system, kidneys, and blood.

What causes lead poisoning?

Lead poisoning is usually caused by months or years of exposure to small amounts of lead in the home, work, or day care environment. It can also happen very quickly with exposure to high concentrations. The most common source of lead exposure for children is lead-based paint and dust and soil that are contaminated by it, especially in older homes and buildings.[1] Some estimates say that as many as three-quarters of dwellings built before 1980 have indoor surfaces painted with lead-containing paint.[2] Toys and jewelry made in other countries can sometimes contain high lead levels. For a list of recalled products, see the Consumer Product Safety Commission Web site at www.cpsc.gov.

Adults are most often exposed to lead in the workplace or while doing hobbies. Those who work with lead—such as metal smelters, welders, or pottery makers—are at a higher risk of lead poisoning.[3]

Other sources of lead exposure include:

- Contaminated air (including industrial emissions), water, and soil.
- Certain hobbies, such as working with stained glass, building lead-based models, reloading ammunition, or shooting at indoor ranges.

- Some alternative medicines and supplements, such as certain vitamins from India.[4]
- Eating food or juice stored in cans made with lead or glazed with lead-based glazes, which are not manufactured in the United States.

Most people are exposed to some amount of lead in their lifetime. Although environmental regulations have reduced lead exposure in the United States, it is still a significant health risk, especially for young children. It is estimated that lead poisoning affects over 310,000 children in the U.S.[5]

What are the symptoms?

There may be no noticeable symptoms of lead poisoning because the effects are subtle or may mimic other conditions. When lead poisoning levels are severe, some general symptoms can include digestive problems, fatigue, headaches, and higher rates of tooth decay.

Children with chronic lead poisoning may show slightly lower intelligence and may be smaller in size than children their age who do not have lead poisoning. Behavioral problems can include irritability or aggressiveness, hyperactivity, learning difficulties, lethargy, and loss of appetite.

In adults, behavioral symptoms can include irritability, mood and personality changes, changes in sleep patterns, difficulty concentrating, and memory loss.

At high levels, lead can affect the central nervous system, leading to poor coordination, weakness in hands and feet, headaches, and in severe cases, convulsions, paralysis, and coma.

How is lead poisoning diagnosed?

A lead blood test measures the amount of lead in the blood. Although this test does not measure the complete level of lead in the body, it is the best test available at this time.

A urine sample collected over 24 hours and tested for lead can give an information about the total lead in the body (body lead burden) and is often used before treatment to remove lead (chelation therapy) is started.

Diagnosing lead poisoning is difficult because the symptoms can be caused by many diseases. Most children with lead poisoning do not have symptoms until their blood lead levels are very high. A blood lead test is necessary to identify these children.[6]

How is it treated?

Treatment for lead poisoning includes removing the source of lead exposure and eating a balanced diet. Adequate nutrition, especially sufficient iron intake, helps prevent absorption of lead. Often this treatment approach is enough to reduce lead levels in the body. If this is not successful or if lead levels are very high, chelation therapy may be used. Chelation therapy involves taking medicines that bind to lead in the body and help speed its elimination through the kidneys.

It is important to make sure that children are not exposed to lead. The most effective means of prevention is to keep children out of buildings that contain lead-based paint until the lead has been either removed or sealed away and the environment is certified by professionals to be free of lead residues.

Who is at highest risk of lead poisoning?

Lead poisoning can occur at any age, but children are most vulnerable to contamination. Children who are at highest risk for lead poisoning include those who:

- Live in homes or buildings built before 1978, especially if built before 1950 when lead-based paint was commonly used.
- Reside in the inner cities rather than the suburbs in the United States.[7]
- Have been adopted or recently immigrated from countries where lead poisoning is common, such as China.[8]
- Are between the ages of 1 to 5 years. Babies and young children are most vulnerable to lead poisoning because they:
    - Often put their hands and objects in their mouths.
    - Sometimes swallow nonfood items.
    - Have higher gastrointestinal absorption of lead.
    - Have brains that are rapidly developing.

Additionally, lead exposure or lead poisoning may occur in:

- People whose drinking water flows through lead-soldered pipes.
- Adults who work with lead either in their occupation or as a hobby, such as metal smelters, pottery makers, or stained glass artists.
- People who eat food from cans made with lead solder, which are manufactured outside the United States.
- People who use ceramic containers for cooking or storing food or beverages. Some ceramic glaze contains lead that may have been improperly fired or cured.
- People who eat or breathe traditional or folk remedies that contain lead, such as some herbs and vitamins from India.[4]
- People who live in communities contaminated by industrial emissions.

Frequently Asked Questions

Learning about lead poisoning:

- What is lead poisoning?
- What causes lead poisoning?
- What are the symptoms of lead poisoning?
- Is lead poisoning preventable?
- Are there other conditions with symptoms similar to lead poisoning?
- Can a test find lead poisoning early?

Being diagnosed:

- What are the signs of lead poisoning?
- How is lead poisoning diagnosed?
- Who is at risk for lead poisoning?
- Who should be screened for lead poisoning and when?
- What factors increase the risk of getting lead poisoning?

Getting treatment:

- How is lead poisoning treated?
- What kind of doctor treats lead poisoning?
- Are there medicines that can treat lead poisoning?
- Is surgery an option?

Ongoing concerns:

- What are the long-term effects of lead poisoning?

Living with lead poisoning:

- What can I do at home to reduce exposure to lead?
- What can be done to help a family member with lead poisoning?

End-of-life issues:

- Can lead poisoning be fatal?

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