

**PEDIATRIC
ENVIRONMENTAL
HEALTH:
CHILDHOOD LEAD
TOXICITY**

GENERAL INFORMATION

- ◉ Due to toy recalls involving lead, the district has begun a project to test toys for lead in Early Childhood, Elementary Special Education, and Kindergarten classrooms. The Early Childhood classrooms were tested in fall 2007 and five percent of toys contained lead and were disposed of.
- ◉ Childhood lead poisoning continues to be a major preventable environmental health problem. Children under six years old and pregnant women and their unborn babies are the most vulnerable to lead.
- ◉ It is the policy of St. Cloud Area School District 742 to take precautions to minimize the risk of exposure to lead-based materials and to ensure that all of its facilities provide clean and healthy environments which are safe and secure.

GENERAL INFORMATION

CONTINUED...

- ◉ The importance of the cooperation and active participation of the district staff in helping minimize the risk of lead exposure to children cannot be emphasized enough.
- ◉ Being knowledgeable about the common sources of exposure to lead, how lead gets into the body, signs and symptoms of lead poisoning, the main components of the diagnosing and treatment of childhood lead poisoning, as well as the requirements of the district to ensure toys in classrooms are tested for lead content, can help make our district a safe environment for all of our students.
- ◉ An annual review of the following information can provide the district staff with the resources for preventing and detecting childhood lead poisoning.

SOURCES AND USES OF LEAD

- Lead in paint is the most common source of environmental exposure.
 - Lead is invisible and has no smell.
 - Lead makes paint more durable and for many decades was routinely used as an additive.
 - The use of lead in house paint, on products marketed to children, and in dishes or cookware was legally banned in the U.S. in 1978.
 - However, paint that includes lead remains in an estimated 25-40 million U.S. homes.
 - All houses built before 1978 are likely to contain some lead-based paint. However, it is the deterioration of this paint that causes a problem, and thus, household dust can be a major source of lead.

SOURCES AND USES OF LEAD CONTINUED...

- ◉ Hot water is more likely than cold water to contain higher levels of lead.
- ◉ Lead is currently used in vehicular batteries, cable sheathing, chemicals, and many construction materials.
- ◉ Leaded gasoline is used in much of the developing world.
- ◉ Lead has also been found in several cosmetics and folk remedies in use in Latin America, the Mideast, and Asia.

SOURCES AND USES OF LEAD CONTINUED...

- Toys and toy jewelry
 - Lead is still used in other countries and can still be found on imported toys either in the paint on the toys or in the actual plastic.
 - When plastic toys containing lead are exposed to sunlight, air, and detergents, the chemical bond between the lead and plastics breaks down, forming a dust that children can inhale.

HOW LEAD CAN GET INSIDE THE BODY

- ◉ The gastrointestinal (GI) tract serves as the primary route of entry into the body; hand-to-mouth behavior can result in ingestion of lead-containing dust or paint chips.
- ◉ Lead fumes may be inhaled.
- ◉ Children may also drink contaminated water.
- ◉ Organic lead (found in gasoline) can be absorbed through the skin, however inorganic lead (found in paint) is poorly absorbed through the skin.

SUSCEPTIBILITY

- ◉ The occurrence of lead poisoning depends on the developmental stage, behavior, nutritional status, and the metabolism of an exposed individual.
- ◉ Children under six years old and pregnant women and their unborn babies are the most vulnerable to lead.
 - Children's organs, such as the brain, are still developing and thus are more vulnerable to lead.
 - Children are more likely to engage in hand-to-mouth activities (finger-sucking), and so are more likely to ingest lead.
 - Exposed children who suffer poor nutrition are more likely to have elevated blood lead levels. Children who do not drink milk are more likely to have elevated blood lead levels because calcium from milk competes with lead for absorptive sites.
 - Some children can be affected by genetic traits that make them particularly sensitive to lead.
- ◉ Adults are less likely to be affected by lead because their developmental status reduces their risk, they're less likely to engage in behavior that places them at risk for lead ingestion, and their organ systems are less vulnerable to lead.

EFFECTS OF LEAD ON THE BODY

- ◉ Virtually all cells are affected by lead.
- ◉ Lead can affect the body's ability to breakdown and use nutrients.
- ◉ Children with elevated blood lead levels are, on average, about 1 cm shorter than their genetic potential.
- ◉ Hearing at all frequencies decreases as blood lead levels increase. Parents may describe children who won't listen.

EFFECTS OF LEAD ON THE BODY CONTINUED...

- The MOST CRITICAL effects of lead poisoning are observed in the cognition and behavior of children.
 - The effect on cognition is most pronounced when exposures occur while a baby is still in the mother's uterus or in the first years of a child's life.
 - Previous studies found teacher ratings of behavior to be poorer in children with higher lead levels.
 - A recent study of 7 to 11 year old children found a significant relationship between bone lead levels and behaviors predictive of later delinquency.

EFFECTS OF LEAD ON THE BODY CONTINUED...

- ◉ The gastrointestinal (GI) tract and Central Nervous System (CNS) are most noticeably affected.
- ◉ When blood lead levels reach a certain degree, children will experience GI symptoms such as pain, loss of appetite, nausea, vomiting, and constipation.
- ◉ Parents often complain of hyperactivity in children with even mildly elevated blood lead levels.
- ◉ As levels get even greater, children may exhibit signs of increased pressure on the brain and develop seizures or lapse into a coma.
- ◉ Symptoms of lead poisoning are found in less than 1% of all children with elevated blood lead levels, and generally become apparent only late in the progression of the disorder.

HOW LEAD POISONING IS DIAGNOSED

- ◉ Involves three components: medical history that identifies the presence of risk factors (known exposure to peeling leaded paint), careful evaluation of the GI and CNS symptoms, and a tissue sample for direct lead determination.
- ◉ The current standard for determining whether lead absorption has occurred is a measurement of the blood lead level.
- ◉ If initial blood testing finds the child's blood lead level to be elevated, then careful follow-up is mandatory.
- ◉ *Note: The blood concentration of lead is not fully predictive of the amount of lead in a critical organ such as the brain, and symptoms for a given blood lead level may vary greatly among individuals.

HOW LEAD POISONING IS DIAGNOSED CONTINUED...

- Screening is based on local risk assessment of exposure to lead and residence in a geographic area known to have large amounts of lead.
 - Examples of Personal Risk Questions:
 - 1. Does the child reside in or regularly visit a house that was built before 1950?
 - 2. Does the child reside in or regularly visit a house built before 1978 undergoing recent (past 6 months) or current renovations?
 - 3. Does the child have a sibling or playmate who has been diagnosed with lead poisoning?

TREATMENT AND PREVENTION

- Four components to treatment: environmental control, behavior modification, nutrition counseling, and drug therapy.
 - Environmental control- Eliminate the sources of lead exposure. Don't allow children access to areas with flaking, lead-based paint until these surfaces are repaired and the lead-containing paint is removed.
 - Behavior modification for parents and children- Instruct parent to clean dust and loose paint from any surface if visible. Parents should closely observe children in order to stop any hand-to-mouth activity. Parents should wash children's hands before eating to remove any lead on their hands before it can be ingested.

TREATMENT AND PREVENTION CONTINUED...

- Nutrition counseling- Parents should make sure their children are getting adequate amounts of calcium and iron because a deficiency in these two minerals may enhance lead absorption, retention, and toxicity.
- Treatment- A specific drug is given to the child (either orally or by injection) which will enhance the excretion of lead in the child's urine. Most children exhibit a rebound in their blood lead levels within days to weeks of completion of treatment; levels eventually stabilize. Without drug treatment, but with cessation of ingestion, blood lead levels will also eventually fall as a function of aging in most children. This reflects declining lead content in critical organs, and reduced toxicity. Elimination of lead and/or treatment over 3 to 6 months is associated with a fall in blood lead measures and an improvement in cognitive scores and behavior.

IMPLEMENTING DISTRICT PROCEDURES REGARDING LEAD IN TOYS

- Building administrators will ensure the following requirements are implemented:
 - 1. District staff are not to bring used toys to school or accept donations of used toys.
 - 2. Prior to purchasing or accepting donations of new toys, district staff are to check the toy manufacturer's web site for any information regarding hazards as well as the following web sites to be sure there are no recalls on the product:
 - Consumer Products Safety Commission (CPSC):
 - www.cpsc.gov
 - Center for Disease Control (CDC):
 - www.cdc.gov/nceh/lead/recalls



IMPLEMENTING DISTRICT PROCEDURES REGARDING LEAD IN TOYS CONTINUED...

- 3. District staff responsible for purchasing or accepting donations of new toys will keep a log of these toys, and periodically check the above web sites for any recalls.
- 4. Early Childhood, Kindergarten, and Elementary Special Education staff will be inserviced annually on Childhood Lead Toxicity conducted by district health services utilizing a Training Manual on Pediatric Environmental Health: "Putting it Into Practice" a module developed by the Children's Environmental Health Network and other current information materials.



IMPLEMENTING DISTRICT PROCEDURES REGARDING LEAD IN TOYS CONTINUED...

- Exceptions: Plastic chairs, floor mats and costly student communication devices which contain lead will be kept at Roosevelt Early Childhood Center. Furnishings and equipment that contain lead will remain in the buildings and will be regularly cleaned and inspected to ensure the condition is intact. Students and staff will be expected to wash or sanitize hands following use of these items.

MORE INFORMATION ON TOY RECALLS

- ◉ Lead has recently been found in some children's toys, jewelry, and charms.
- ◉ Countries that export toys may still use lead-based paint on toys as well as the plastics the toys are made with.
- ◉ Old toys made in the U.S. before 1978 may likely contain lead.

SOME TOYS THAT HAVE BEEN RECALLED

- Fisher-Price® recalled approximately 967,000 toys, including *Sesame Street*®, *Dora the Explorer*®, and other licensed characters.
- Mattel® recalled approximately 253,000 toy *Sarge*® cars.
- RC2 Corporation® recalled approximately 1.5 million *Thomas and Friends*® wooden railway toys.
- For a complete updated list of lead-related toy recalls visit the following web sites:
 - The Centers for Disease Control and Prevention (CDC) Web site at
 - www.cdc.gov/nceh/lead/Recalls
 - The Federal Government's recall website at
 - www.recall.gov

IF A CHILD HAS ONE OF THESE TOYS, DOES HE OR SHE NEED A LEAD TEST?

- The best way to find out if your child has been exposed to lead is with a blood lead test. Parents should discuss the need for this test with their physician.
- Testing may be appropriate for children who frequently chew on toys, put toys into their mouth, or has frequent hand-to-mouth activity.



TESTING CHILDREN'S TOYS FOR LEAD

- ◉ Although do-it yourself kits are available, they do not indicate how much lead is present and their reliability and detecting levels of lead has not been determined.
- ◉ Testing should only be done by a licensed lead inspector or risk assessor. Moreover, only a certified laboratory can accurately test a toy for lead. Contact the Minnesota Department of Health (MDH) for a list of certified lead firms or accredited laboratories that test for lead.

WHAT SHOULD BE DONE WITH TOYS THAT HAVE BEEN RECALLED?

- ◉ Do not allow children to play with recalled toys. Until the toys can be returned or destroyed as directed, put the toys in a place where children cannot find them. Because each recall is different, MDH recommends checking the recall notice to learn how to return the toy for a refund or replacement.
- ◉ If there is any doubt about whether or not an item contains lead, it would be safer to dispose of that item.

ADDITIONAL QUESTIONS?

- For more information about lead, contact the MDH Lead Program at (651) 201-4620 or visit the following website:

www.health.state.mn.us/divs/eh

