

Elevated Blood Lead Investigation Guideline

<u>CONTENT:</u>	<u>VERSION DATE:</u>
Investigation Protocol:	
• Investigation Guideline	11/2013
Supporting Materials found in attachments:	
• Appendix A: PEHSU Recommendations on Medical Management of Childhood Lead Exposure and Poisoning	04/2013
• Appendix B: Lead Fact Sheet	11/2013
• Appendix C: MAPEHSU Lead Poisoning Fact Sheet	9/2010
• Appendix D: Ten Things You Can Do To Get The Lead Out	11/2013
• Appendix E: EPA Lead and a Healthy Diet	11/2001
• Appendix F: Adult Lead Poisoning Information	11/2013

Elevated Blood Lead

Disease Management and Investigative Guidelines

CASE DEFINITION

Elevated Blood Lead Level, Childhood

Laboratory Criteria for Case Classification:

- Blood lead level test results greater than or equal to 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) for persons less than 18 years of age

Elevated Blood Lead Level, Adult

Laboratory Criteria for Case Classification:

- Blood lead level test results greater than or equal to 25 micrograms per deciliter ($\mu\text{g}/\text{dL}$) for persons 18 years of age or older

LABORATORY ANALYSIS

The results of any blood lead draw (capillary, venous or unknown sample type) on a child or adult that produces a quantifiable result and is analyzed by a CLIA-certified facility or an approved portable device is acceptable.

The Kansas Health and Environmental Laboratories (KHEL) will analyze blood samples collected by local health departments and other approved facilities via:

- collection of a venous sample
- collection of a capillary sample using a capillary tube (microtainer or vacutainer)
- collection of a capillary sample using filter paper
- collection of a capillary sample and using a Lead Care analyzer

Additionally, KHEL will provide blood collection supplies at no cost to Kansas local health departments and other approved facilities. Supplies must be ordered on a "Requisition for Laboratory Specimen Kits" available on the Kansas Healthy Homes and Lead Hazard Prevention Program website: www.kshealthyhomes.org.

EPIDEMIOLOGY

According to the Centers for Disease Control and Prevention, approximately 250,000 US children ages 1-5 years have blood lead levels greater than 10 micrograms of lead per deciliter of blood. The prevalence for Region 7, where Kansas is located, approaches 12% in some areas. The most common source of lead poisoning in children comes from deteriorating lead-based paint, and in Kansas, a large proportion of the homes were built before 1978 when the addition of lead in residential paint was banned. Other sources of lead include lead pellets from guns, cosmetics or medicines from other countries, hobbies such as pottery, and certain occupations including lead battery manufacturing.

DISEASE OVERVIEW

A. Agent:

Lead is found throughout our environment. It is a naturally occurring bluish-gray metal found in small amounts in the Earth's crust. A good amount of lead in our environment comes from human activities including burning fossil fuels, mining, and manufacturing. In the United States, the most common source of exposure for lead-poisoned children is lead-based paint while the majority of adult cases are workplace-related. A blood lead test is the only way to tell if a child or adult has an elevated blood lead level.

B. Clinical Description:

The health effects of lead exposure include intellectual and behavioral deficit in children and hypertension and kidney disease in adults (ATSDR, 1999).

C. Routes of exposure:

The most common routes of exposure to lead are ingestion and inhalation.

D. Treatment:

Primary care physicians and/or nurses managing a child with an elevated blood lead level, defined as 10 micrograms per deciliter or greater, should contact Dr. Jennifer Lowry at Children's Mercy Hospital for a free elevated blood lead medical consultation.

Jennifer Lowry, MD
Chief, Section of Clinical Toxicology
Division of Clinical Pharmacology and Therapeutic Innovations
Children's Mercy Hospital and Clinics
Phone: 816-234-3059
Email: JLowry@cmh.edu

NOTIFICATION TO PUBLIC HEALTH AUTHORITIES

Elevated blood lead levels in children and adults are reportable by laboratories directly to the Kansas Department of Health and Environment-Bureau of Epidemiology and Public Health Informatics within 24 hours. Non-elevated blood lead test results for children and adults are reportable to KDHE-BEPHI within 30 days.

**Kansas Department of Health and Environment (KDHE)
Bureau of Epidemiology and Public Health Informatics (BEPHI)
Phone: 1-877-427-7317
Fax: 1-877-427-7318**

INVESTIGATOR RESPONSIBILITIES

Elevated Blood Lead Level, Childhood

Definition: Blood lead level test results greater than or equal to 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) for persons less than 18 years of age

Upon notification of an elevated blood lead test result for a child:

- 1) Accept the case in EpiTrax.
- 2) Contact the primary care physician, ordering physician or nurse who requested the blood lead test.
- 3) For all elevated childhood blood lead cases, recommend that the physician/nurse contact Dr. Jennifer Lowry at Children's Mercy Hospital for a free medical consultation to discuss treatment options and an appropriate schedule for re-testing.

Jennifer Lowry, MD
Chief, Section of Clinical Toxicology
Division of Clinical Pharmacology and Therapeutic Innovations
Children's Mercy Hospital and Clinics
Phone: 816-234-3059
Email: JLowry@cmh.edu

**** Do not put confidential patient information in an email.
Refer to the EpiTrax Record Number ****

- 4) Email or fax the PEHSU Recommendations on Medical Management of Childhood Lead Exposure and Poisoning ([Appendix A](#)) to the primary care physician/nurse managing the elevated child.
- 5) Provide the following educational materials to BOTH the treating physician/nurse AND the family directly:
 - Lead Fact Sheet ([Appendix B](#))
 - MAPEHSU Lead Poisoning Fact Sheet ([Appendix C](#))
 - Ten Things You Can Do To Get The Lead Out ([Appendix D](#))
 - EPA: Lead and a Healthy Diet ([Appendix E](#))
- 6) Gather the following information from the primary care physician/nurse AND/OR the family. Update the EpiTrax record with the following information:

- In the Demographics tab
 - Verify name of patient and correct spelling
 - Name of parent/guardian
 - Guardian relationship to patient
 - Contact information for parent/guardian
 - Verify patient date of birth
 - Patient gender
 - Patient ethnicity
 - Patient race
 - Patient primary language
 - Insurance type
- In the Clinical tab
 - Whether the patient is hospitalized
 - Any current treatment by the physician
 - Verify clinician's (physician's) name
- In the Encounter tab, choose the Encounter you are working on. The Encounter is the lab report for the current blood lead test result.
 - Residential address where the child was living at the time of the blood sample
 - Date the residence was first occupied. The default date, as entered by KDHE, is the sample date from the lab report. Change to the date the patient first lived at the current address.
- 7)** If there are other children living in the home with an elevated blood lead child, or spending a significant amount of time in the same home, recommend to the parent/guardian that all additional children in the home have a blood lead test.
- 8)** Record actions completed and recommendations in the "Notes" section of the case in EpiTrax.

Elevated Blood Lead Level, Adult

Definition: Blood lead level test results greater than or equal to 25 micrograms per deciliter ($\mu\text{g/dL}$) for persons 18 years of age or older

Upon notification of an elevated blood lead test result for an adult:

- 1) Accept the case in EpiTrax.
- 2) Contact the patient directly and provide them with the Adult Blood Lead Poisoning Information sheet ([Appendix F](#)).
- 3) Ask the adult case if there are any children living in the same home, or spending a significant amount of time in the same home, as the elevated adult. If so, recommend that all children have a blood lead test.
- 4) Educate the adult case on the following facts and prevention measures:
 - In Kansas, the majority of adult blood lead poisoning is work-related.
 - Educate the adult case that they should shower, wash hair, and change into clean clothes and shoes after work to avoid contaminating vehicles and homes that children may come into contact with. "Take home lead" can potentially harm children.
 - Educate the adult case to eat a well-balanced diet, including an adequate intake of iron, vitamin C, calcium and fiber-rich foods to help the body eliminate lead naturally.
- 5) Gather the following information from the patient. Update the EpiTrax record with the following information:
 - In the Epidemiological Tab
 - Occupation
 - The type of place where they work
 - The name of the place where they work
 - Address of the place where they work
- 6) Record actions completed and recommendations in the Notes section of the case in EpiTrax.

REFERENCES

Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological profile for lead. Atlanta, GA: US Department of Health and Human Services, Agency for Toxic Substances and Disease Registry; 1999. Available at: www.atsdr.cdc.gov/toxprofiles/index.asp. Accessed on: November 5, 2013.

Recommendations on Medical Management of Childhood Lead Exposure and Poisoning

No level of lead in the blood is safe. In 2012, the CDC established a new “reference value” for blood lead levels (5 mcg/dL), thereby lowering the level at which evaluation and intervention are recommended (CDC).

Lead level	Recommendation
< 5 mcg/dL	<ol style="list-style-type: none"> 1. Review lab results with family. For reference, the geometric mean blood lead level for children 1-5 years old is less than 2 mcg/dL . 2. Repeat the blood lead level in 6-12 months if the child is at high risk or risk changes during the timeframe. Ensure levels are done at 1 and 2 years of age. 3. For children screened at age < 12 months, consider retesting in 3-6 months as lead exposure may increase as mobility increases. 4. Perform routine health maintenance including assessment of nutrition, physical and mental development, as well as iron deficiency risk factors. 5. Provide anticipatory guidance on common sources of environmental lead exposure: paint in homes built prior to 1978, soil near roadways or other sources of lead, take-home exposures related to adult occupations, imported spices, cosmetics, folk remedies, and cookware.
5-14 mcg/dL	<ol style="list-style-type: none"> 1. Perform steps as described above for levels < 5 mcg/dL. 2. Re-test venous blood lead level within 1-3 months to ensure the lead level is not rising. If it is stable or decreasing, retest the blood lead level in 3 months. Refer patient to local health authorities if such resources are available. Most states require elevated blood lead levels be reported to the state health department. Contact the CDC at 800-CDC-INFO (800-232-4636) or the National Lead Information Center at 800-424-LEAD (5323) for resources regarding lead poisoning prevention and local childhood lead poisoning prevention programs. 3. Take a careful environmental history to identify potential sources of exposures (see #5 above) and provide preliminary advice about reducing/eliminating exposures. Take care to consider other children who may be exposed. 4. Provide nutritional counseling related to calcium and iron. In addition, recommend having a fruit at every meal as iron absorption quadruples when taken with Vitamin C-containing foods. Encourage the consumption of iron-enriched foods (e.g., cereals, meats). Some children may be eligible for Special Supplemental Nutrition Program for Women, Infants and Child (WIC) or other nutritional counseling. 5. Ensure iron sufficiency with adequate laboratory testing (CBC, Ferritin, CRP) and treatment per AAP guidelines. Consider starting a multivitamin with iron. 6. Perform structured developmental screening evaluations at child health maintenance visits, as lead’s effect on development may manifest over years.
15-44 mcg/dL	<ol style="list-style-type: none"> 1. Perform steps as described above for levels 5-14 mcg/dL. 2. Confirm the blood lead level with repeat venous sample within 1 to 4 weeks. 3. Additional, specific evaluation of the child, such as abdominal x-ray should be considered based on the environmental investigation and history (e.g., pica for paint chips, mouthing behaviors). Gut decontamination may be considered if leaded foreign bodies are visualized on x-ray. Any treatment for blood lead levels in this range should be done in consultation with an expert. Contact local PEHSU or PCC for guidance; see resources on back for contact information.
>44 mcg/dL	<ol style="list-style-type: none"> 1. Follow guidance for BLL 15-44 mcg/dL as listed above. 2. Confirm the blood lead level with repeat venous lead level within 48 hours. 3. Consider hospitalization and/or chelation therapy (managed with the assistance of an experienced provider). Safety of the home with respect to lead hazards, isolation of the lead source, family social situation, and chronicity of the exposure are factors that may influence management. Contact your regional PEHSU or PCC for assistance; see resources on back for contact information.

Principles of Lead Exposure in Children

- A child’s blood lead concentration depends on their environment, habits, and nutritional status. Each of these can influence lead absorption. Children with differing habits or nutritional status but who live in the same environment can vary on blood lead concentration. Further, as children age or change residences, habits or environments change creating or reducing lead exposure potential.
- While clinically evident effects such as anemia, abdominal pain, nephropathy, and encephalopathy are seen at levels >40 µg/dL, even levels below 10 µg/dL are associated with subclinical effects such inattention and hyperactivity, and decreased cognitive function. Levels above 100 µg/dL may result in fatal cerebral edema.
- Lead exposure can be viewed as a lifelong exposure, even after blood lead levels decline. Bone acts as a reservoir for lead over an individual’s lifetime. Childhood lead exposure has potential consequences for adult health and is linked to hypertension, renal insufficiency, and increased cardiovascular-related mortality.
- Since lead shares common absorptive mechanisms with iron, calcium, and zinc, nutritional deficiencies in these minerals promotes lead absorption. Acting synergistically with lead, deficiencies in these minerals can also worsen lead-related neurotoxicity.

Principles of Lead Screening

- Lead screening is typically performed with a capillary specimen obtained by a finger prick with blood blotted onto a testing paper. Testing in this manner requires that the skin surface be clean; false positives are common. Therefore, elevated capillary blood lead levels should be followed by venipuncture testing to confirm the blood lead level. In cases where the capillary specimen demonstrates an elevated lead level but the follow-up venipuncture does not, it is important to recognize that the child may live in a lead-contaminated environment that resulted in contamination of the finger tip. Efforts should be made to identify and eliminate the source of lead in these cases. Where feasible, lead screening should be performed by venipuncture.

Principles of Iron Deficiency Screening

- The iron deficiency state enhances absorption of ingested lead.
- Hemoglobin is a lagging indicator of iron deficiency and only 40% of children with anemia are iron deficient.
- Lead exposed children (≥ 5 mcg/dL) are at risk for iron deficiency and should be screened using CBC, Ferritin, and CRP. Alternatively, reticulocyte hemoglobin can be used, if available.
- Children with iron deficiency, with or without anemia, should be treated with iron supplementation.

Resources

• Pediatric Environmental Health Specialty Unit (PEHSU)Network	• www.pehsu.net or 888-347-2632
• Poison Control Center (PCC)	• www.aapcc.org/ or 800-222-1222
• Centers for Disease Control and Prevention	• www.cdc.gov/nceh/lead/ or 800-232-4636
• U.S. Environmental Protection Agency	• www.epa.gov/lead/ or 800-424-5323

Suggested Reading and References:

Pediatric Environmental Health, 3rd edition. American Academy of Pediatrics, 2012.
 Woolf A, Goldman R, Bellinger D. *Pediatric Clinics of North America* 2007;54(2):271-294.
 Levin R, et al. *Environmental Health Perspectives* 2008; 116(10):1285-1293.
 Baker RD, Greer FR. *Pediatrics* 2010;126(5):1040-50.
 Guidelines for the Identification and Management of Lead Exposure in Pregnant and Lactating Women. CDC, 2010.
 CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in “Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention” June 7, 2012

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(April 2013 version)

Appendix B: Lead Fact Sheet

Lead Fact Sheet

What happens to lead when it enters the environment?

- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.

How might I be exposed to lead?

- Eating food or drinking water that contains lead.
- Work, hobbies, some herbal medications

How can lead affect my health?

- The effects of lead are the same whether it enters the body through breathing or swallowing.
- Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children.
- Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system.
- It may also cause weakness in fingers, wrists, or ankles.
- Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia.
- Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death.
- In pregnant women, high levels of exposure to lead may cause miscarriage.
- High-level exposure in men can damage the organs responsible for sperm production.

How does lead affect children?

- Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.
- Children are more vulnerable to lead poisoning than adults.
- A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage.
- If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur.
- Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

How can families reduce the risk of exposure to lead?

- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.
- If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children.
- If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Interventions

- Advise caregivers to provide children with an adequate intake of iron-containing foods. Recommend that they:
 - Introduce pureed meats as soon as the child is developmentally ready.
 - Provide one serving of lean red meat per day to older children.
 - Provide supplements only under the supervision of a physician or nutritionist and only when anemia or iron deficiency is documented.
- Encourage caregivers to provide children with adequate intake of vitamin C-containing foods. Recommend that they:
 - Provide two servings of fruit juices or fruits per day.
 - Provide supplements only under the supervision of a physician or nutritionist.
- Encourage caregivers to provide children with adequate intake of calcium (500 mg/day @ 1-3 years; 800 mg/day @ 4-8 years). Recommend that they:
 - Provide two servings per day of dairy products or other calcium-rich foods.
 - Provide supplements only under the supervision of a physician or nutritionist.

Appendix C: MAPEHSU Lead Poisoning Fact Sheet



Lead Poisoning

General information:

The national prevalence for childhood blood lead elevations, 10 mcg/dl, or greater is 4.4%. In Region 7, this number is higher and approaches 12% in some areas. It is known that the most common source of lead poisoning in children comes from the dusting and chipping of deteriorating lead-based paint. In 1978, federal law required the reduction of lead in house paint to non-harmful levels. Most of the homes in the region were built before 1978. Other sources of lead include lead pellets from guns, cosmetics or medicines from other countries, hobbies such as pottery, and certain occupations.

Health Effects:

Symptoms of lead poisoning are usually subtle. Children can have symptoms such as behavior or learning disabilities, growth failure, developmental delay and hearing loss at low levels. Higher levels can result in abdominal pain and constipation, anemia, seizures and encephalopathy. Adults can be affected as well. At low levels, they may have constipation, wrist drop, joint pain, memory loss and concentration difficulties. At higher levels, abdominal pain, anemia, infertility and encephalopathy may occur.

Risk Factors:

Does the child...

- ★ Have siblings or playmates who have or had lead poisoning?
- ★ Live in or frequently visit a house or daycare built before 1950?
- ★ Reside in or frequently visit a house built before 1978 with remodeling within the last six months?
- ★ Eat or mouth non-food items (pica)?
- ★ Play in bare soil or reside in a lead smelting area?
- ★ Reside with an individual who works with or has hobbies using lead?
- ★ Receive unusual medicine or folk remedies?

If you answered yes to any of the questions, you should be tested. **Regardless of risk factors**, a blood lead test is indicated for all children at least twice during the first 24 months of life.

What should you do if you have lead poisoning?

Currently, no action is taken for levels under 10 mcg/dl. If your level is higher, you should contact your physician for family lead education materials. This information will aid in determining how to eliminate your contact with lead. You should have repeat lead tests to ensure that the lead level is decreasing.

If your level is greater than 20 mcg/dl, your Local Public Health Agency should be notified. Often times, this is mandatory notification by your physician. But, you should contact them yourself if you don't hear from them. They will be able to determine what the source of lead is and tell you how to clean it up. Your lead level will come down on its own if you are not being re-exposed to lead.

As a child, if your level is above 44 mcg/dl, you will need to be put on medication. Depending on the level, you may be able to take oral medication as an outpatient. But, if it is really high, you may need to go into the hospital for treatment. Your doctor will be able to determine this. Because lead can be absorbed more quickly while you are on this medication, you will need to find a different place to be while the source is cleaned up. Adults are not put on treatment until they are at a higher level.

How often should I get tested?

All children should have at least two lead levels drawn in the first 24 months of life. Depending on those results or the risk assessment, more testing may need to be done. If you have had an elevated level, your doctor will want to retest you every few months to make sure that the level is coming down.

Appendix D: Ten Things You Can Do To Get The Lead Out

Ten Things You Can Do To Get The Lead Out

- **Have your child tested for lead** with a blood test during a regular pediatric visit. Children should be tested at about 12 months of age and again at 24 months. High risk children should be tested every 6 months until 2 years of age and then each year until age 6. Record results of tests.
- **Wash children's hands** after play, before eating, and before bed. Wash their toys, pacifiers and other objects they put in their mouths.
- **Use only lead-free ceramics** for cooking or storing food. Pottery from foreign countries often contains lead.
- **Feed your child** 3 meals a day with foods high in **calcium** (milk, cheese, yogurt) and **iron** (lean meat, beans, eggs) and give them healthy snacks.
- **Use only cold water** from the cold water tap for cooking or for making baby formula.
- **Run water** from the cold water tap until the temperature changes (about 1 minute). Once a week, use detergent **to wet mop** floors, window sills, furniture or other surfaces that may contain lead in dust.
- If your home was built before 1978, **test your home for lead** before renovating or repairing. Never sandblast paint.
- **Keep your child away from peeling, chipping paint.**
- Plant shrubs, grass, or other **ground cover on bare soil** you suspect may contain lead.
- **Recycle spent rechargeable batteries.**

Is Your Child at High Risk For Lead Poisoning?

YES to any of these questions means that your child is at high risk.

Does your child...

- ⇒ Live in or stay at a house built before 1950?
- ⇒ Live in or regularly visit a house built before 1978 with recent or ongoing renovations or remodeling?
- ⇒ Live with an adult whose job or hobby exposes them to lead? (Furniture refinishing, making stained glass, electronics, soldering, automotive repair, making fishing weights and lures, reloading shotgun shells and bullets, participating in indoor firing ranges, doing home repairs and remodeling, and making pottery)
- ⇒ Eats dirt, paint chips, or other non-food items?
- ⇒ Have a brother or sister with a high blood lead level?
- ⇒ Have iron deficiency, anemia, sickle cell disease, a developmental delay, or behavioral problems?

Lead is dangerous and can cause serious permanent damage at levels much lower than was thought just a few years ago. Small children are more at risk of being lead poisoned because they often put non-food items in their mouths. The only way to protect your child is to prevent exposure to lead.

Lead can affect the ability of your child to learn. Lead can cause a delay in speech and can result in learning disabilities or behavioral problems. It may also damage a pregnant woman and her unborn child.

A lead poisoned child usually does not look sick! The only way to know if your child is sick is to do a blood lead test. It is very important to test toddlers. Your doctor or health department can do a blood test.

Kansas Healthy Homes and Lead Hazard Prevention Program
1000 SW Jackson Suite 330 Topeka, KS, 66612-1274
1-866-865-3233 Fax(785) 296-5594 www.kshealthyhomes.org



Kansas Healthy Homes and Lead Hazard Prevention Program is committed to conducting activities that reflect the Kansas Department of Health and Environment's mission to protect the health and environment of all Kansans by promoting responsible choices.



Diez cosas que puede hacer para manenerse alejado del plomo

- ◆ Haga a su niño un exámen para plomo con un exámen de sangre en su visista regular con su pe diatra. Los niños deben examinarse a los 12 meses y despues a los 24 mese de edad. Los niños en alto riezgo deberán ser examinados cada 6 meses hasta los dos años y despues cada año hasta cumplir seis años. Registre los resultados.
- ◆ Lava las manos de sus niños, despues de jugar, antes de comer, y antes de ir a la cama. Lave sus juguetes, chupones y otros objetos que se lleven a la boca.
- ◆ Use solamente la cerámica sin plomo para cocinar o almacenar el alimento. La cerámica de países extranjeros contiene a menudo el plomo.
- ◆ Alimente a su niño 3 comidas al día con alimentos ricos en calcio (leche, queso, yogurt) y hierro (carne, frijoles, huevos) y ofrescales bocadillos sanos entre comidas.
- ◆ Use solamente agua fría para cocinar o preparar la leche para el bebé. Deje correr el agua de la llave hasta que sienta que la temperatura cambia (aproximadamente un minuto).
- ◆ Una ves a la semana, use detergente para trapear los pisos, marcos de las ventanas, muebles y otras superficies que pudieran contener polvo de plomo.
- ◆ Si su casa fué construída antes 1978. Examine su casa por plomo antes de renovarla o repararla. Nunca raspe la pintura.
- ◆ Mantenga a su niño lejos de pintura despostillada o descarapelada.
- ◆ Arbustos, pasto, pisos de tierra, pueden ser so spechosa de contener plomo.
- ◆ Recicle las baterias recargables.

Está su niño en alto riesgo para el envenenamiento por plomo?

Si contesta SI a cualquiera de las siguientes preguntas significa que su niño está en alto riesgo.

SI SU NIÑO.....

- Vive o está en una casa construída antes de 1950?
- Vive o vista regularmente una casa construída antes de 1978 con renovaciones o remodelaciones recientes?
- Vive con un adulto que su trabajo o pasatiempos se encuentre en contacto con plomo? (barnizado de muebles, vitrales, electronica, soldadura, reparación de automóviles, pesas para pesca y anzuelos, armas o balas, campo de tiro cerrodo, reparar, remodela o hace cerámica en casa).
- Tiene el habito de comer cosas extrañas como pintura, tierra o alguna cosa diferente de los alimentos normales?
- Tiene un hermano o hermana con altos niveles de plomo en la sangre?
- Tiene una deficiencia de hierro en la sangre, anemia, celulas falciformes retraso en el crecimiento o problemas de conducta?

El plomo es peligroso y puede causar daño permanente a niveles mucho mas bajos de lo que se pensaba hace pocos años. Los niños pequeños tienê más riesgo de ser envenenados por plomo porque son ellos los que frecuentemente se llevan objetos a la boca. El unico camino para protejerlo es PREVENIR la exposición al plomo.

El plomo puede afectar la habilidad de su niño para aprender. El plomo puede causar retraso para hablar y puede resultar en incapacidad o problemas en su conducta. También puede causar daño a la mujer embarazada y su bebé que aun no nace.

El niño envenenado con plomo no parece estar enfermo! El único camino para saber si su nino se encuentra enfermo es hacer una prueba de plomo en la sangre. Es muy importante

Kansas Healthy Homes and Lead Hazard Prevention Program
1000 SW Jackson Suite 330 Topeka, KS, 66612-1274
1-866-865-3233 Fax(785) 296-5594 www.kshealthyhomes.org

Appendix E: Lead and a Healthy Diet

Lead and a Healthy Diet

What You Can Do to Protect Your Child

Lead's Effects on the Body

Lead is a poisonous metal that our bodies cannot use. Lead poisoning can cause learning, hearing, and behavioral problems, and can harm your child's brain, kidneys, and other organs. Lead in the body stops good minerals such as iron and calcium from working right. Some of these effects may be permanent.



Lead Awareness and Your Child

Children with lead poisoning usually do not look or act sick. The only way to know if your child has lead poisoning is by getting a blood test.

Ask your doctor or health care provider to test your child under six years of age at least once a year.

Lead Hazards

Where is Lead Found?

Main Sources of Lead

Lead-based paint is a hazard if it is peeling, chipping, chalking, or cracking. Even lead-based paint that appears to be undisturbed can be a problem if it is on surfaces that children chew or that get a lot of wear and tear. The older your home is, the more likely it is to contain lead-based paint.

Contaminated dust forms when lead paint is dry-scraped or sanded. Dust can also become contaminated when painted surfaces bump or rub together. Lead chips and dust can gather on surfaces and objects that people touch or that children put into their mouths.

Lead poisoning occurs **without** any

obvious symptoms and **harms**



your child's body.

Contaminated soil occurs when exterior lead-based paint from houses, buildings, or other structures flakes or peels and gets into the soil. Soil near roadways may also be contaminated from past use of leaded gasoline in cars. Avoid these areas when planting vegetable gardens.

Other Sources of Lead

Contaminated drinking water from older plumbing fixtures

Lead-based painted toys and household furniture

Imported lead-glazed pottery and leaded crystal

Lead smelters

Hobbies

Folk remedies like azarcon and pay-loo-ah

Cosmetics like kohl and kajal

Do not store **food** in glazed pottery from foreign countries.



Oatmeal Swirlers • Makes 4–6 servings

1 1/2 cups of quick cooking oats
1/3 cup of peanut butter
1/3 cup of fruit jelly or jam

Steps:

- Follow the package directions to cook oats.
- Spoon peanut butter and jelly on top of cooked oatmeal.
- Stir and spoon into bowls.
- Serve with low-fat milk.



French Toast • Makes 4–6 servings

3 eggs, beaten
1/2 cup of low-fat milk
Vegetable oil
6 slices of bread
Cinnamon
2 bananas, sliced

Steps:

- Mix eggs and milk.
- Lightly coat pan with vegetable oil. Use medium heat.
- Dip bread into egg mixture, so that bread is covered.
- Brown one side of bread in pan.
- Sprinkle top with cinnamon.
- Turn over bread and brown the other side. Top with sliced banana.
- Serve with low-fat milk.

Cheese Omelet • Makes 2–3 servings

3 eggs
1 tablespoon of low-fat milk
Vegetable oil
3 tablespoons of cheese

Steps:

- Mix eggs and milk in a bowl.
- Lightly coat pan with vegetable oil. Use medium heat.
- Add egg mixture and cook.
- When omelet is cooked on the bottom, add cheese.
- When cheese is melted, fold omelet in half.
- Top with salsa if you like.
- Serve with toast, fruit, and low-fat milk.

Grilled Cheese & Tomato Sandwich • Makes 1 serving

2 slices of bread
2 slices of American cheese
1 slice of tomato
Vegetable oil

Steps:

- Make sandwich using bread, cheese, and tomato.
- Lightly coat pan with vegetable oil.
- Brown sandwich on both sides over low heat to melt the cheese.
- Serve with low-fat milk or fruit juice.



Tuna Salad Sandwich • Makes 2 servings

4 slices of bread
1 can of water packed tuna
4 teaspoons of low-fat mayonnaise
Onion and celery, chopped

Steps:

- Mix tuna with low-fat mayonnaise, onion, and celery.
- Try your sandwich with cheese and tomato.
- Serve with low-fat milk.



Pizza Bagels • Makes 2–3 servings

1 bagel
2 tablespoons of tomato sauce
Garlic, basil, or oregano
2 tablespoons of cheddar cheese or part-skim mozzarella

Steps:

- Preheat oven to 400 degrees.
- Slice open a bagel and place on a flat pan.
- Add tomato sauce, seasonings, and cheese.
- Bake for 3 minutes or until cheese melts.
- Serve with fruit juice.

Sloppy Joes • Makes 4–6 servings

1 pound of lean ground beef, turkey, or chicken
1 small onion, chopped
1/2 green pepper, chopped
1 cup of tomato sauce
Your choice of seasonings
5 hamburger buns or pita pocket breads

Steps:

- In a pan, cook lean ground meat, onion, and green pepper until meat is well done.
- Drain fat.
- Stir in tomato sauce and seasonings.
- Cook for 5 to 10 minutes.
- Spoon into hamburger bun or pita.
- Serve with fruit juice.



Baked Macaroni and Cheese • Makes 3–5 servings

4 cups of cooked macaroni
3 cups of grated cheddar cheese
2 tablespoons of margarine
2 tablespoons of flour
Vegetable oil
2 cups of low-fat milk
Salt and pepper

Steps:

- Preheat oven to 375 degrees. Lightly coat casserole dish with vegetable oil.
- Mix cooked macaroni with grated cheese and pour into casserole.
- Melt margarine in a pan. Remove from heat, stir in flour. Return to heat.
- Add low-fat milk slowly, stirring until smooth.
- Season with salt and pepper to taste.
- Pour over macaroni. Stir.
- Cover. Bake for 30 minutes.
- Uncover and bake for another 15 minutes.

Chicken Stew • Makes 6–8 servings

3 pounds of frying chicken, cut up into small pieces
Vegetable oil
1 medium onion, chopped
1 stalk of celery, chopped
28 ounce can of stewed tomatoes
Poultry seasoning

Steps:

- Lightly coat pot with vegetable oil. Use medium heat.
- Cook chicken until it is well done.
- Add can of stewed tomatoes.
- Add vegetables and seasoning.
 - Cover and cook over low heat for 30 minutes.
 - Serve with rice or noodles.

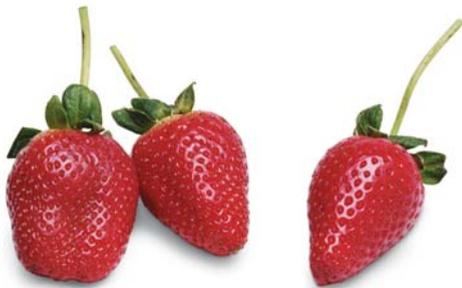


Banana Strawberry Smoothie • Makes 2–3 servings

1 cup of low-fat milk
1 cup of fresh or frozen strawberries, mashed
1 ripe banana, mashed

Steps:

- Mix all together in a blender or use a wire whisk.
- Eat as a snack or for dessert.



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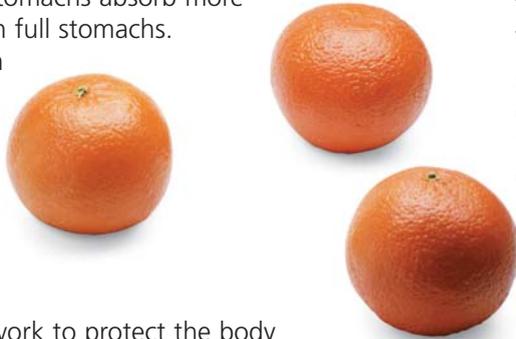


LEAD
Awareness
Program

Regularly Eat Healthy Foods

Children with empty stomachs absorb more lead than children with full stomachs.

Provide your child with four to six small meals during the day. The following nutrients can help protect your child from lead poisoning:



Iron-Rich Foods

Normal levels of iron work to protect the body from the harmful effects of lead. Good sources of dietary iron include:

Lean red meats, fish, and chicken
Iron-fortified cereals
Dried fruits (raisins, prunes)

Calcium-Rich Foods

Calcium reduces lead absorption and also helps make teeth and bones strong. Good sources of dietary calcium include:

Milk
Yogurt
Cheese
Green leafy vegetables (spinach, kale, collard greens)



Vitamin C-Rich Foods

Vitamin C and iron-rich foods work together to reduce lead absorption. Good sources of vitamin C include:

Oranges, orange juice
Grapefruits, grapefruit juice
Tomatoes, tomato juice
Green peppers

A healthy diet can help

protect
your **child**
from the harmful effects
of lead.



Simple Steps You Can Take

to Protect Your Family from Lead Hazards

If you think your home has high levels of lead:

- Make sure your children eat healthy, low-fat foods high in iron, calcium, and vitamin C.
- Get your children tested for lead, even if they seem healthy.
- Get your home tested for lead if it was built before 1978. Call **1-800-424-LEAD** for more information.
- Always wash your hands before eating.
- Wash children's hands, bottles, pacifiers, and toys.
- Do not use imported pottery to store or serve food.
- Let tap water run for one minute before using.
- Use only cold water for making your baby's formula, drinking, and cooking.
- Regularly clean floors, windowsills, and other surfaces using wet methods that control dust.
- Wipe or remove shoes before entering your house.
- If you rent, it is your landlord's job to keep paint in good shape. Report peeling or chipping paint to your landlord and call your health department if the paint is not repaired safely.
- Take precautions to avoid exposure to lead dust when remodeling or renovating.
- Don't try to remove paint yourself!



For more information on childhood lead poisoning prevention:

Call

- Your child's pediatrician
- The National Lead Information Center
1-800-424-LEAD (424-5323)
- U.S. Environmental Protection Agency's (EPA) Safe Drinking Water Hotline
1-800-426-4791



Visit

- EPA Lead Program Web site
www.epa.gov/lead
- U.S. Centers for Disease Control and Prevention (CDC) Web site
www.cdc.gov/nceh/lead
- U.S. Department of Housing and Urban Development (HUD) Web site
www.hud.gov/offices/lead





Fight **Lead Poisoning** with a Healthy Diet

Lead Poisoning Prevention Tips
for Families



Appendix F: Adult Lead Poisoning Information

Adult Lead Poisoning Information

What is lead and why is it harmful?

Lead is a naturally occurring element that people have used for centuries. A soft metal, bluish-gray in color, lead has no characteristic taste or smell. Lead is also a **highly toxic heavy metal poison**. There is no use for lead in the human body. Lead affects the brain and vital organs and is especially harmful to children and to adult reproductive systems. Human activities have spread lead widely throughout the environment, most notably in leaded gasoline and leaded paint, both of which have been restricted in the US. Other products expose adults to lead daily at work and home. Efforts continue to limit the use of lead containing products and minimize harmful effects on people. Once lead gets into your body, it can stay there for a long time. Lead can build up in your body if you are in contact with even a small amount of lead for a long time. The more lead in your body, the more likely that harm will occur.



How does lead get into your body?

Most human exposure to lead occurs through **breathing or eating**. Most adult exposures are occupational and occur in lead-related industries such as lead smelting, refining, metal working and manufacturing industries. One frequent source of lead exposure to adults is home renovation that involves scraping, remodeling, or otherwise disturbing lead-based paint. Adults can also be exposed during certain hobbies and activities where lead is used. Workers may inhale lead dust and lead oxide fumes, as well as eat, drink, and smoke in or near contaminated areas, thereby increasing their probability of lead ingestion. It only takes a very small amount, for instance in dust or fumes to poison a human. Lead in the body is measured through a blood test and recorded in micrograms of lead per deciliter of blood, $\mu\text{g}/\text{dL}$.

What lead levels are considered harmful in adults?

- 1-20 $\mu\text{g}/\text{dL}$, lead exposure is evident and lead is storing in the body and initial detrimental health effects may be occurring.
- 20-30 $\mu\text{g}/\text{dL}$, regular lead exposure is occurring and there is increased risk of health problems.
- 30 - 50 $\mu\text{g}/\text{dL}$ health damage may be occurring, even if there are no symptoms.
- 50 - 80 $\mu\text{g}/\text{dL}$ serious long term health damage may occur.
- Greater than 80 $\mu\text{g}/\text{dL}$ serious, permanent health damage or death may occur.



Blood lead levels can rise quickly. With frequent monitoring, dangerous exposures can be quickly identified and corrected.

The following list outlines some of the potential dangers of lead poisoning to health. Even exposure to amounts of lead too low to cause symptoms in the short term may increase the risk of high blood pressure and mental decline in the future. Symptoms in adults may include:

Fatigue, headache, abdominal pain, memory loss, mood disorders, muscular weakness, joint pain, numbness or tingling of the extremities, reduced sperm count, abnormal sperm, miscarriage or premature birth in pregnant women.

High Risk Lead Exposure Occupations

Auto body repair
Battery Manufacturing
Compounding plastic resins
Construction / Remodeling
Gun firing ranges
Lead soldering: electronics, plumbing etc.
Manufacturing of: ammunition and explosives
Ceramics: inks, dyes, glazes, paints, or pigments
Leaded glass or crystal
Stained glass windows/lamps etc
Lead fishing weights and lures
Plating operations
Radiator Repair
Salvaging and recycling scrap
Metal
Smelting
Welding

For more information on how you can protect yourself and your family from the dangers of lead contact our program. We will be glad to answer your questions.

Q: How do I find out if I have been exposed?

A: Have a blood lead test performed. It is quick and simple. Contact your physician, your local health department or our program for more information and to arrange for your test today.

Lead Safe Work Practices:

Following these simple rules when working with lead can help protect you and your family from lead poisoning.

(1) Do not eat, drink or smoke in lead-contaminated work areas.



(2) Wash your hands before eating, smoking, or touching your face after working with lead.



(3) Wear your protective equipment over your clothing whenever you work with lead.



(4) Shower, wash your hair and change into clean clothes (including shoes) before leaving the workplace. "Take home lead" can contaminate your vehicle, home, and potentially harm your family, especially young children.



(5) Store street clothes in a separate area from your work clothes.



(6) Eating a well-balanced diet with proper nutrition, can help reduce lead levels.



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