

Get the Lead Out!

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Your Environment... Your Health!

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What is Lead?

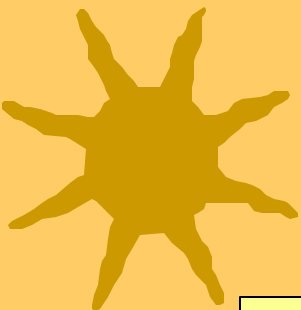


- ★ It is an element found in the environment
- ★ Lead does not break down.



PERIODIC TABLE OF THE ELEMENTS

The image shows a standard periodic table of elements. The element Lead (Pb) is highlighted with a red circle. It is located in the 6th period, 14th group. The table includes various sections such as 'Elementary Substances Properties' and 'Main Character of a Single Chemical Bond'.





Historical use of lead



★ Ammunition

★ Solder

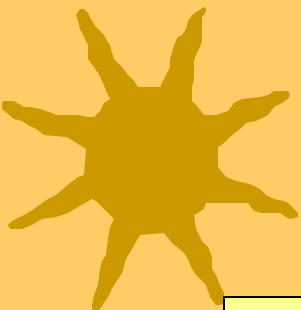


★ Plumbing

★ Ceramics

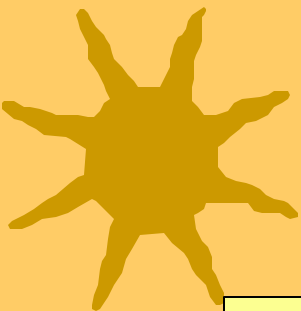
★ Gasoline-banned
in 1996

★ Paints-banned in
1978





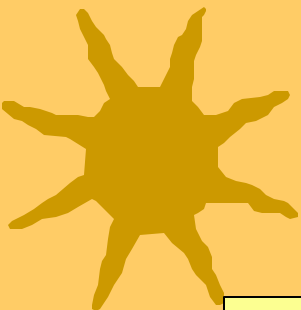
Historical use of lead



Created and supported by the COEP of the EHS Center at Wayne State University , Grant ES06639



Causes of Home Exposures



**Lead-based paint
in pre-1978 houses**

**Imported
food cans**

Doors & windows

**Old painted toys
& furniture**



**Calcium
supplements**

**Colored newspaper
& bread wrappers**

Lead in soil

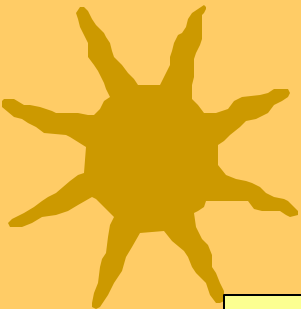
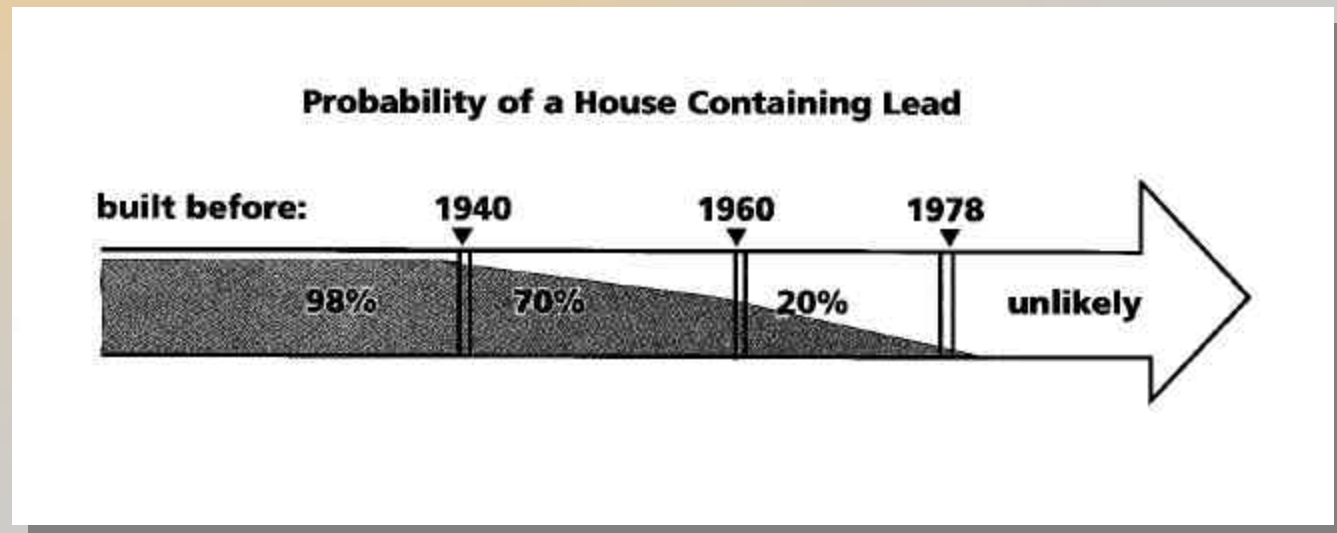
**Old plumbing
fixtures**



Lead Paint is the Primary cause of Lead Poisoning



- ★ Primary source is lead dust in the homes built prior to 1978





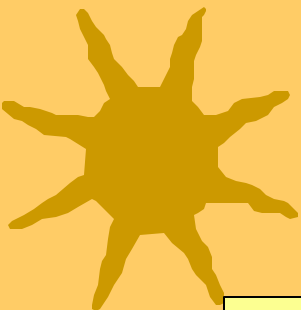
Other Exposures



★ Hobbies that use lead products



★ Occupational exposures



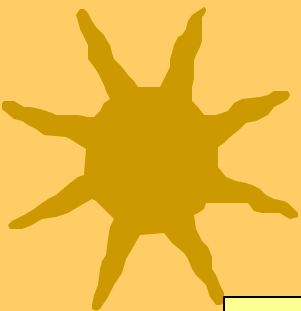
★ Foreign medicines and home remedies



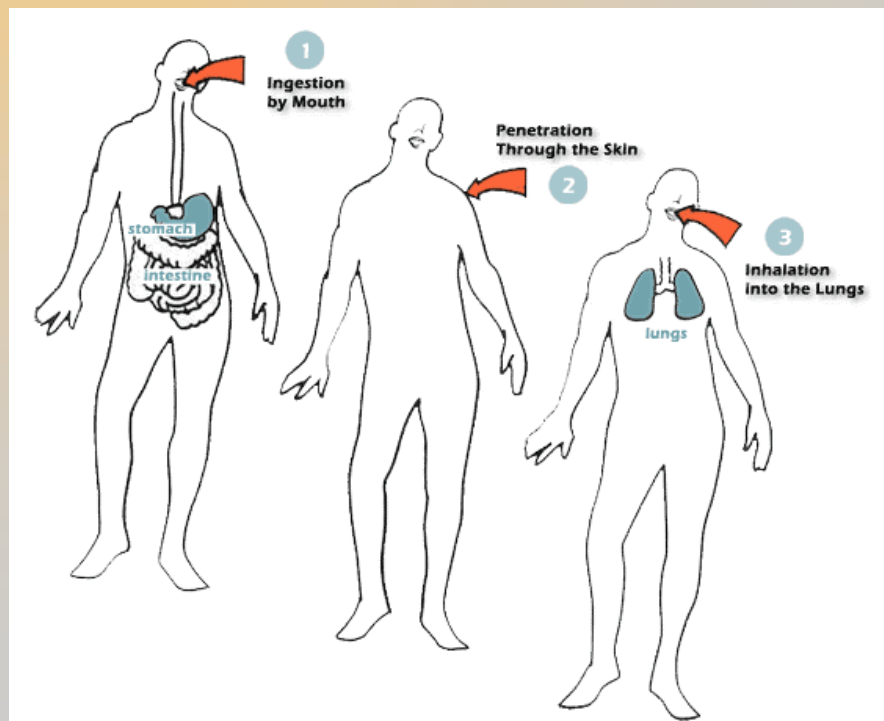
★ Food additives



Routes of Exposure



Lead poisoning develops after repeated exposure to lead, most often this is through ingestion of paint chips or dust.

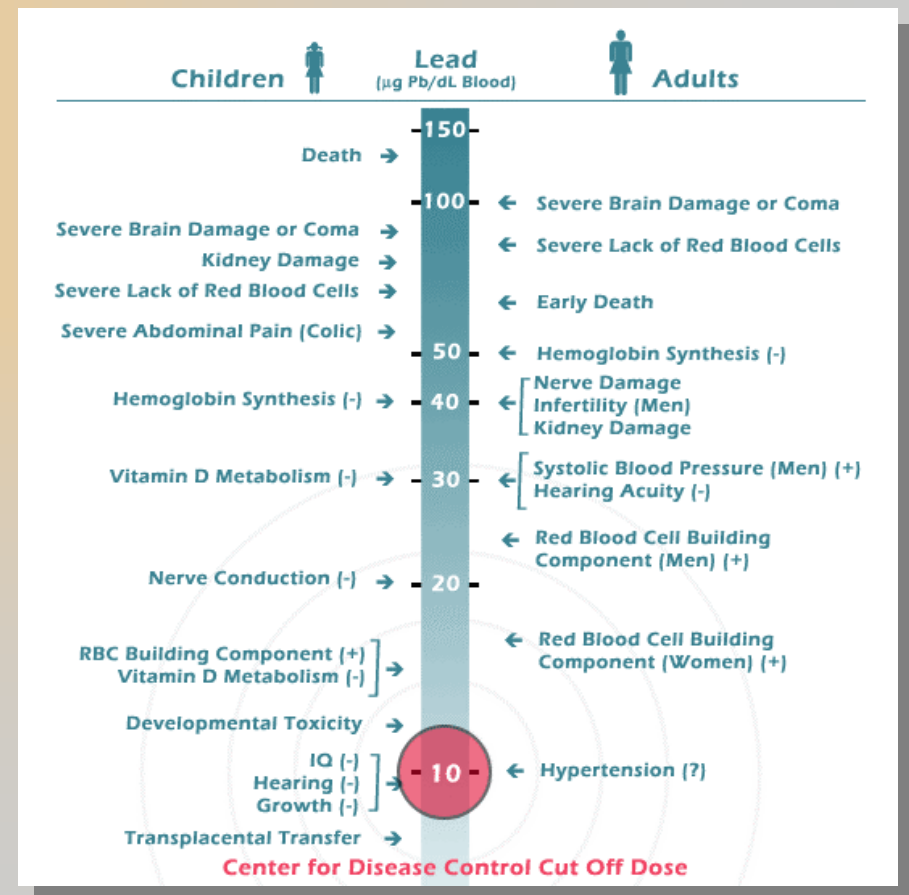
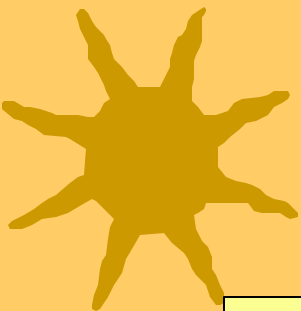




Important points

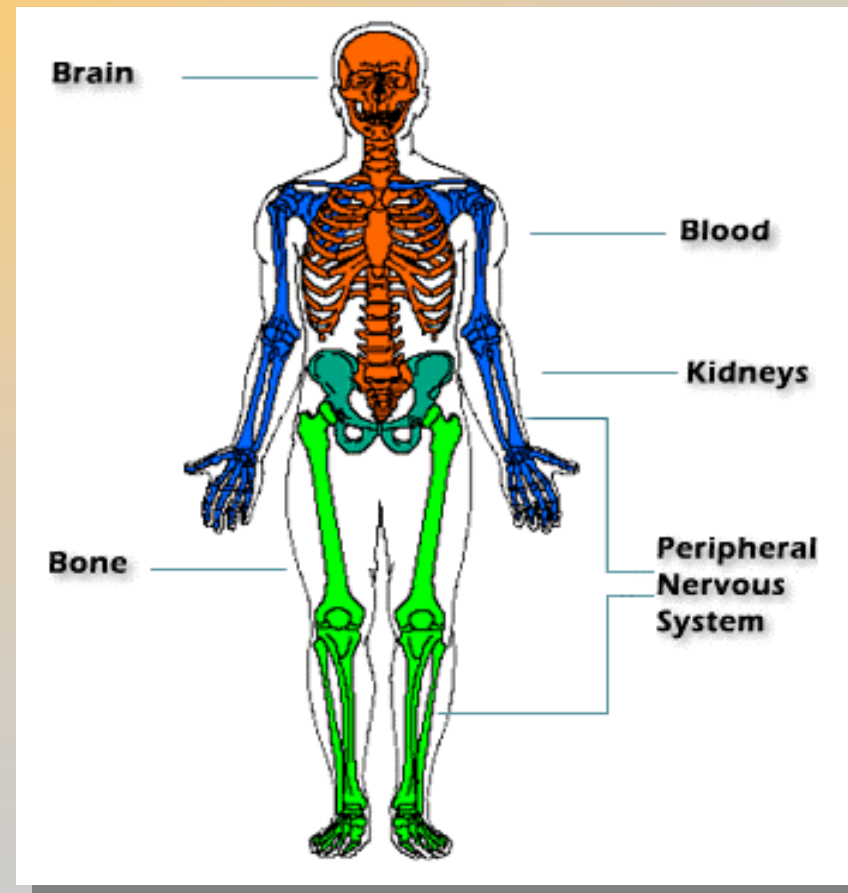
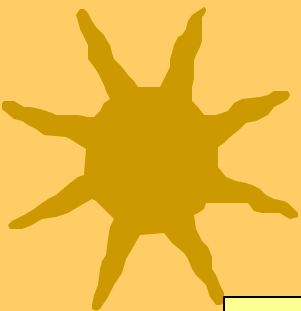


- ★ Lead poisoning is preventable!
- ★ Lead poisoning is usually a silent disease
- ★ It is primarily a childhood illness
- ★ At high levels (50-100 $\mu\text{g}/\text{dL}$ in children, many organs are affected
- ★ At low levels (10 $\mu\text{g}/\text{dL}$) more subtle changes happen in brain function



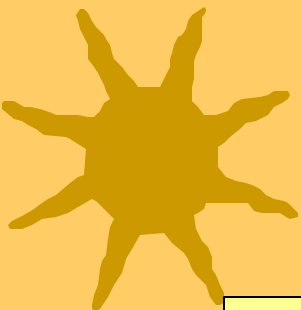


Target Organs

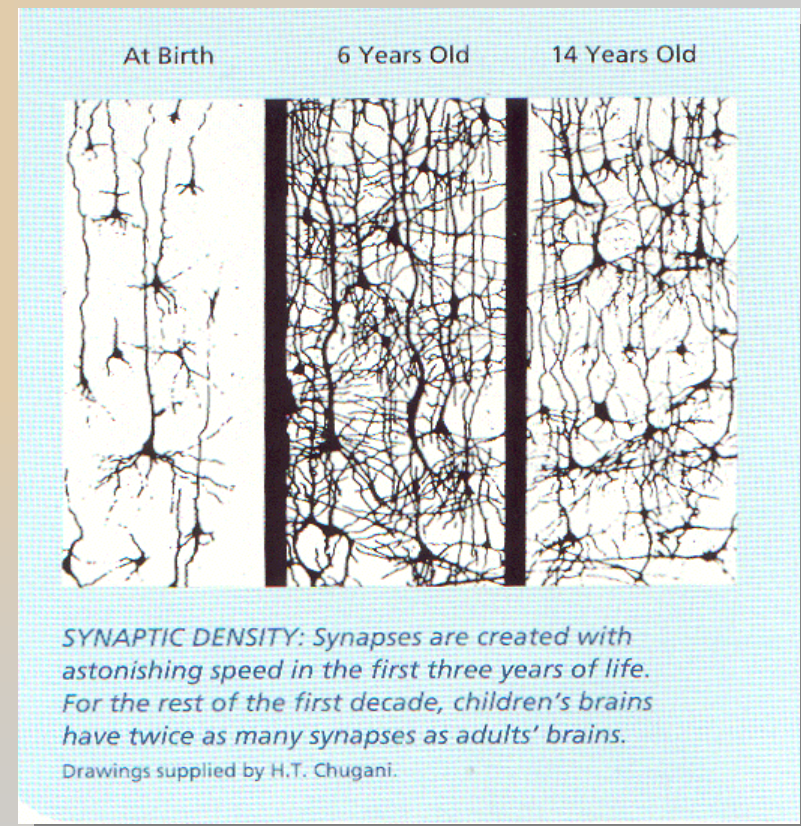




Brain Effects



- ★ Behavioral effects usually are seen in children less than six years old, because brain cells and connections are still being formed
- ★ Neuronal (brain cell) damage in children is usually **not** reversible, because more connections and cells are permanently lost than in a non-lead exposed child





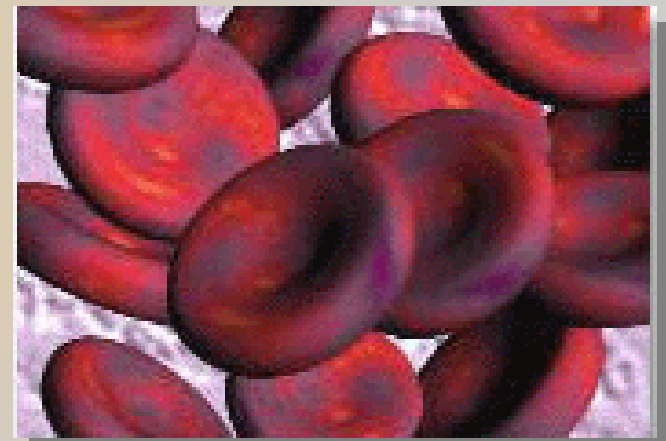
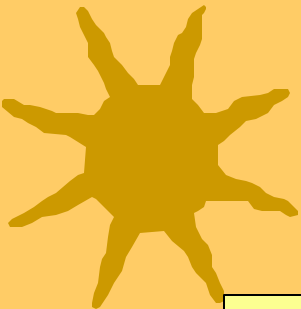
Blood Effects



- ★ In the bone marrow lead interrupts:
 - hemoglobin synthesis (the oxygen carrying part of the red blood cell)
 - the making of red blood cells, resulting in a decrease in the number of red blood cells (anemia).



- ★ Lead also decreases the "life span" of a red blood also resulting in anemia.





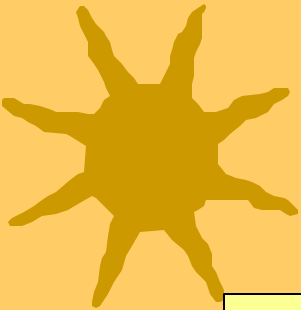
Kidney Effects



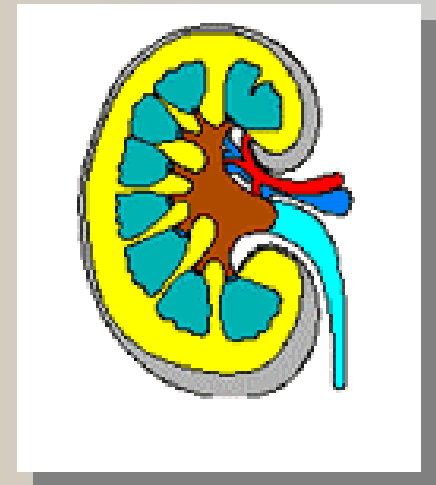
★ The kidney is sensitive to the poisoning effects of lead because it receives 25% of the blood from the heart at all times, and eventually filters all of the body's blood



★ Lead damages special cells in the kidney (tubular cells) which then may slowly lead to kidney failure.

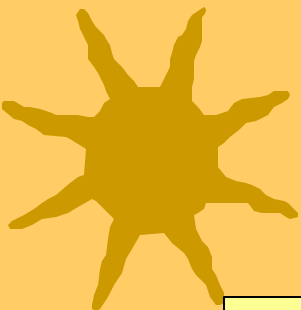


★ Lead also interferes with the Kidney's production of vitamin D which is needed for strong bones

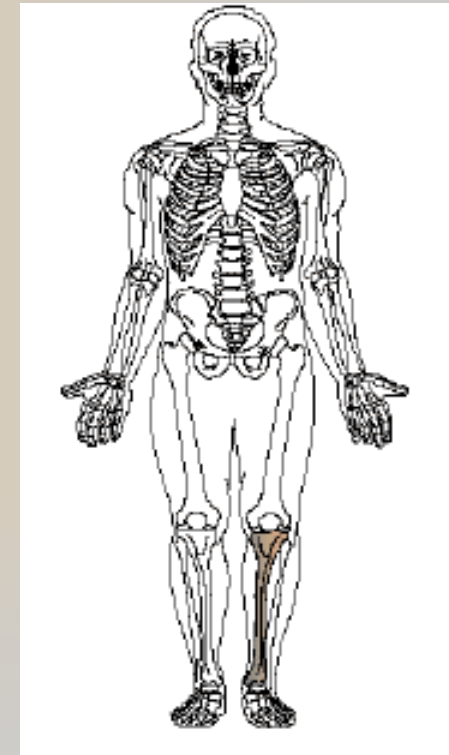




Bone Effects

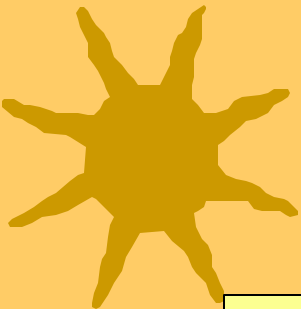


- ★ The bone acts as a major storehouse for lead
- ★ Lead enters and leaves the bone depending on the concentration of lead in the blood
- ★ Lead acts like calcium in the bones
- ★ Lead affects the bone forming and reabsorbing cells of the bone
- ★ Vitamin D from the kidneys needed for strong healthy bones is inhibited by lead

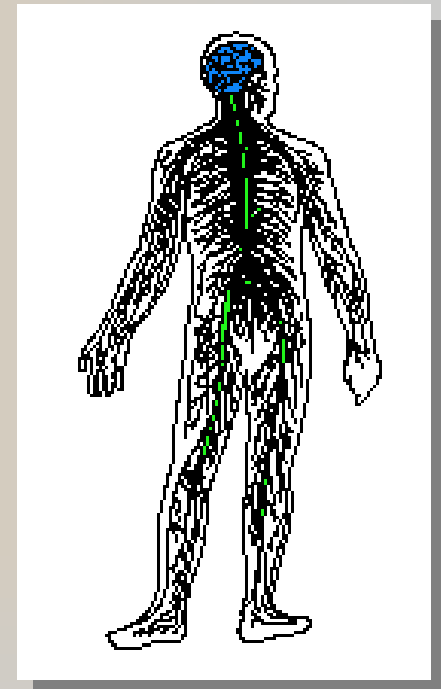




Effects on the Peripheral Nervous System (everything but the brain and spinal cord)

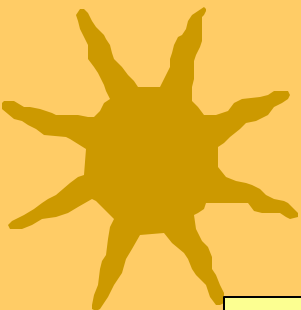


- ★ Effects are most evident on the nerves going to the muscles in the legs and arms.
- ★ Lead causes the protective covering (myelin) on these nerves to fall apart.
- ★ This loss of myelin causes the message moving to the muscle from the brain to be interrupted.
- ★ This loss of message may cause muscles to become weak (wrist drop).





Nutrition Effects



Did You Know?

- !** Children ages 6 months to 6 years can absorb about 30% of ingested lead, while about 15% is absorbed by adults
- !** The most common way lead is ingested is by lead dust. So wash those hands!
- !** Lead is absorbed 10X faster on an empty stomach. So eat healthy snacks often!



Nutrition Effects



Calcium

- Why is calcium important?
- How does lead affect calcium?
- What foods are high in calcium?
- The vitamin D connection

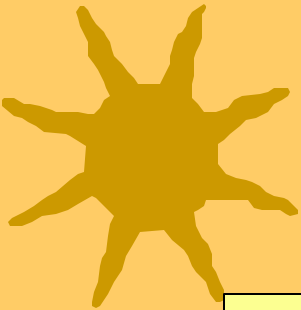
Lead and calcium have physical and chemical similarities. Lead replaces calcium at binding sites and is absorbed in bone like calcium



Iron

- Why is iron important?
- How does lead affect iron?
- What foods are high in iron?

Lead inhibits the absorption of iron. Lead absorption increases when iron levels are deficient



Eat low-fat snacks every day

- Why low fat?
- What snacks are low fat?

Lead absorption and retention is stimulated by a high fat diet



Symptoms



★ Headaches

★ Irritability

★ Abdominal Pain

★ Vomiting

★ Anemia

★ Weight loss

★ Poor Attention span

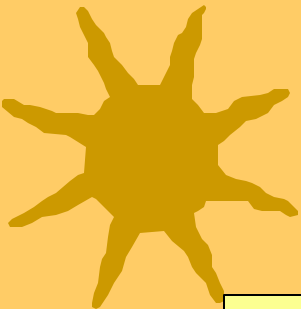
★ Learning difficulties

★ Slowed speech development

★ Hyperactivity

★ Seven-fold increase in failure to graduate from High School

Needleman et al. NEJM 322:83-88, 1990





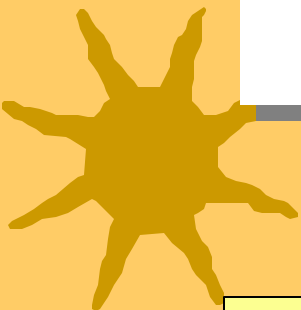
Relevance to Target Audience in the city of Detroit



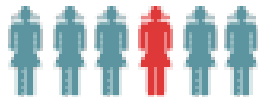
★ 1 out of every 4 children in the city of Detroit is thought to be lead poisoned



★ Only one out of 8 is screened for lead poisoning



Because Detroit has so many old houses, it is thought that 1 out of every 4 children in the city is lead poisoned!

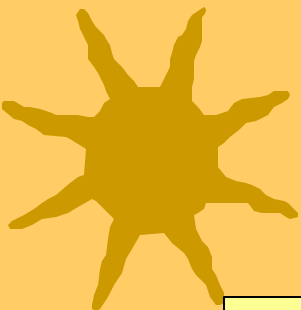


1 out of 6 lead-poisoned children suffers from learning and behavior problems!

Most large urban cities suffer from similar rates



Action Items



If you think you have lead in your house:

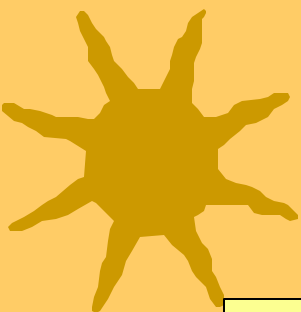
Do These



- ✔ Wash hands after play, before meals and at bedtime
- ✔ Run cold tap water 1-2 minutes before using
- ✔ Wet-mop and wet-dust floors and window sills weekly, using a high-phosphatate cleaner like Cascade
- ✔ Wash toys and stuffed animals often
- ✔ Plant grass or bushes in bare spots in the yard
- ✔ Have a professional remove lead-based paint
- ✔ Clean up paint chips immediately
- ✔ Use a special filter vacuum (HEPA vacuum)
- ✔ If you rent, call your landlord about chipping and peeling paint



Action Items



- ❌ Reuse bread wrappers to store food items in
- ❌ Use canned goods imported from other countries
- ❌ Use hot tap water for drinking or cooking
- ❌ Use a regular vacuum on floors, drapes and furniture
- ❌ Use calcium supplements made from bone meal, dolomite or oystershells
- ❌ Scrape sand, heat or remove lead-based paint
- ❌ Let children play with old or imported toys
- ❌ Refinish old or antique furniture. Have it refinished professionally

DO NOT do these





Dietary Action Items



All of the following should be present in daily diet

Calcium

- Why is calcium important?
- How does lead affect calcium?
- What foods are high in calcium?
- The vitamin D connection

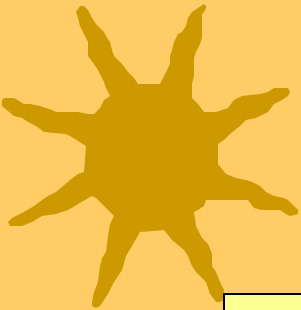
Yogurt, broccoli, milk, greens, salmon with bones



Iron

- Why is iron important?
- How does lead affect iron?
- What foods are high in iron?

Iron-fortified cereal, spinach, beans, peanut butter, red meat



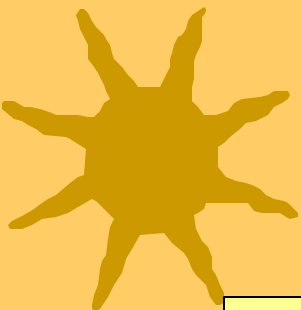
Eat low-fat snacks every day

- Why low fat?
- What snacks are low fat?

Fresh fruits & vegetables, raisins



Conclusion



- ★ Lead poisoning is a preventable disease
- ★ All children in a high risk areas (most large urban cities) should be routinely screened for lead poisoning
- ★ If you suspect lead exposure in your home, immediately call your pediatrician and follow the action item presented

***HELP KEEP OUR CHILDREN
LEAD SAFE***