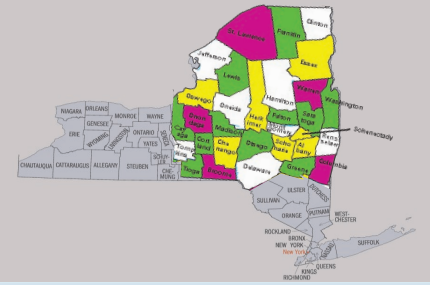




LEAD CENTERPOINT



The Relationship of Iron Deficiency and Lead Poisoning

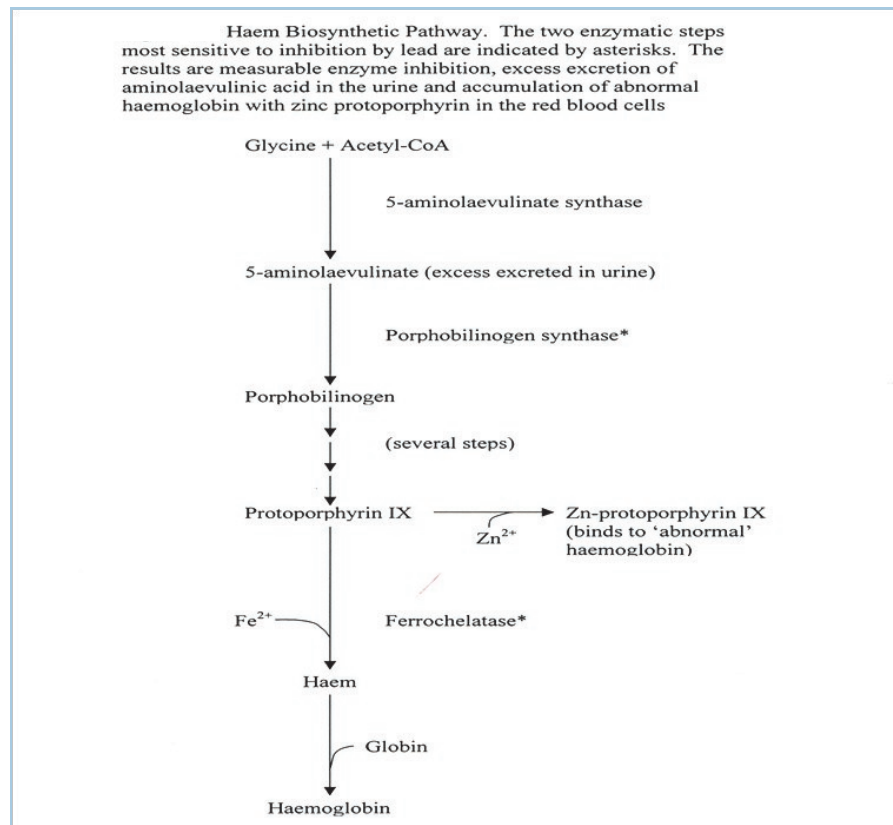
Howard L. Weinberger, MD

Many children who have elevated blood lead levels are also prone to iron deficiency anemia. Even though lead is a universal toxin, children from low income neighborhoods are at greatest risk for exposure to lead. Similarly, they may be at greater risk for inadequate intake of iron in their diet. It is well known that children with iron deficiency absorb lead from the gut more "efficiently" than children who have adequate iron stores. Thus, it is important to monitor the CBC in all children who have elevated blood lead levels and to treat those with iron deficiency with an appropriate dosage of oral iron.

It should also be noted that measuring the EP (or FEP) is very helpful in children with lead exposure. Lead poisons the enzyme at the final stage of heme synthesis in the bone marrow - and the immediate precursor (Protoporphyrin IX) is therefore elevated - that is assessed as the Erythrocyte Protoporphyrin (EP).

Iron is the essential substrate in the step from Protoporphyrin IX to Heme and iron deficiency results in an elevation of the EP as well.

So, monitoring the EP is useful in following children with lead exposure and /or iron deficiency.





FDA Safety Communication

Magellan Diagnostics Lead Care Testing Systems

Conducting screening blood lead tests at ages 1 year and 2 years remains the standard for all children in New York State. Health care providers who collect and analyze the blood in their offices improve their screening rates and have the opportunity to discuss the results with parents the same day. This same day analysis requires point of service equipment.

On May 17, 2017, the FDA released an advisory regarding the use of Magellan Lead Care Testing Systems. The equipment is a point of care CLIA-waived blood lead testing system and is used in many health care providers' offices. Magellan Diagnostics manufactures the testing systems:

Lead Care
Lead Care II
Lead Care Plus
Lead Care Ultra

Per the FDA, **these systems may underestimate blood lead levels and give falsely low results if the sample being analyzed is a venous sample.**

The equipment should be used for blood lead analysis of capillary samples only.

The CDC is recommending to health care professionals that patients be retested if:

- Child was younger than 6 years (72 months) at the time of this alert (May 17, 2017) **and:**
Had a venous blood lead test result of less than 10 µg/dl from a test analyzed using a Magellan Diagnostics' Lead Care analyzer.
- Pregnant women should also be retested if a venous blood sample was analyzed for lead level using one of these devices.
- Conducting screening blood lead tests at ages 1 and 2 years remains the standard.

The equipment can continue to be used for capillary samples per the FDA announcement.

To read the entire FDA warning, go to: <http://www.medscape.com/viewarticle/880121>

Journal Reviews

Maureen Butler RN, BSN

Establishing and Achieving National Goals for Preventing Lead Toxicity and Exposure in Children. Bellinger DC, Chen A, Lanphear BP, *JAMA Pediatrics*. Published online May 15, 2017.

The authors, all well known in the field of pediatric environmental health issues, formed Project TENDR (Targeting Environmental Neurodevelopmental Risks) to identify chemicals known or suspected to increase neurodevelopmental disorders in children. This article discusses the continued harm to children from lead poisoning. The authors provide four specific recommendations with a goal to ensure that by 2021, no child has a blood lead level greater than 5µg/dl and by 2030, no child has a blood lead level greater than 1µg/dl.

Millions of American Children Missing Early Lead Tests, Reuters Finds. Schneyer J, Pell MB. www.reuters.com/investigates/special-report/lead-poisoning-testing-gaps/

This article reviews the lack of universal blood lead testing of young children in the U.S. Lead testing requirements vary from state to state. In addition, despite required testing regulations, many health care providers fail to order the test, or parents do not follow through to have the blood test collected at a laboratory. In New York State, blood lead testing is required at ages 1 year and 2 years but just 55% have had the two tests by age three years. The irreversible consequences of lead exposure in young children are illustrated throughout the article.

Association of Childhood Blood Lead Levels with Cognitive Function and Socioeconomic Status at Age 38 Years and with IQ Change and Socioeconomic Mobility Between Childhood and Adulthood. Reuben A, Caspi A, Belsky DW et al, *JAMA* March 28, 2017, 317(12):1244-1251. doi:10.1001/jama.2017.1712.

The authors' objective was to test the hypothesis that childhood lead exposure is associated with cognitive function and socioeconomic status in adulthood. The authors found an association between children with lead exposure at age 11 years and declines in IQ and downward social mobility at age 38 years.

The "Lead Diet": Can Dietary Approaches Prevent or Treat Lead Exposure?? Kordas K. <https://dx.doi.org/10.1016/j.peds.2017.01.069>

The author reviews the literature for the risk of enhanced absorption of lead from the GI tract when particular nutrients are absent or are present. After summarizing the studies, the author recommends continuing to follow current recommendations particularly for: 1) iron rich foods, 2) eating meals regularly, as fasting and skipping meals is associated with greater blood lead levels in children and 3) making sure that children eat meals with clean hands.



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Health Care Providers and Childhood Lead Poisoning Prevention Community Advocacy

Childhood lead poisoning is a preventable disease. When children are protected from access to lead paint and other leaded sources, the benefits extend beyond the individual child. It is in the best interest of the whole community to provide lead free housing. Many communities in New York State have created Lead Poisoning Task Forces to address the problem locally. In doing so, the unique risks that a city, town or county may have, can be identified and an action plan proposed to eliminate those sources of lead.

The most effective Task Forces have leadership from local government, community activists, parents, public health officials, educators and health care providers. The evidence is clear- -lead poisoning causes irreversible harm to a growing child's brain. Treating children after lead exposure is not the answer. The message needs to be repeated—protect children from lead exposure; provide lead free housing for every child. Health care providers who lobby for the rights of young children have a strong voice and are respected members of the community.

After a long day seeing young patients, time can be short for attending community meetings. The message to protect children from lead exposure is essential. Contact your local county health department to volunteer. Your presence can make a difference. Consider working with other community members to validate and strengthen the message that it is time for every child to live in a lead free environment.