

# New IHS Recommendations for Serum Lead Testing

Program Directors' Meeting  
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David Sprenger, M.D.  
Chief Medical Officer  
IHS/California Area Office

# CMS Regulations

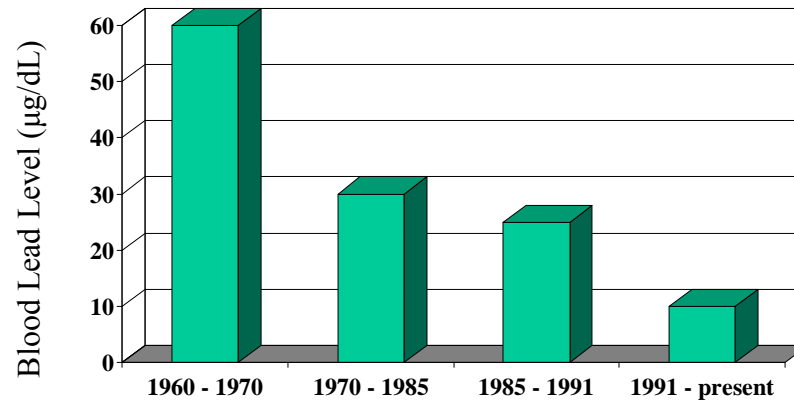
- ▶ Centers for Medicaid / Medicare EPSDT
  - “CMS requires that all children receive a screening blood lead test at 12 months and 24 months of age.”
  - “Children between ...36 months and 72 months ...must receive a screening blood lead test if they have not been previously screened for lead poisoning.”

# Head Start Performance Standards

- ▶ ~ 80% AI/AN Children eligible for Head Start / Medicaid
- ▶ Head Start Performance Standard
  - 45 CFR 1304.20(a)(1)(ii)
    - “Preventive care schedule must incorporate ... CMS Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program of the Medicaid agency of the state”

# History of Lead Action Levels

Recommended Lead Action Levels, 1960 - present



# Lead in our environment

- ▶ Gasoline, food can solder (ended ~ 1978)
- ▶ Paint (ended 1978)
- ▶ Batteries
- ▶ Soil
- ▶ Pottery
- ▶ Toys
- ▶ Traditional medicines
- ▶ Plumbing



<http://webmineral.com/specimens/Galena.jpg>



# What are the harmful effects?

- ▶ Effects largely undetectable until severe poisoning ( $>25$  BLL)
- ▶ ↑ Blood lead
  - ↓ IQ
  - Behavioral problems
  - Stunted growth
  - Cavities
  - Anemia (red blood cells destroyed faster)
  - Kidney problems



Photo: Courtesy CDC Lead exposure investigation team, Peru 2007

# Who gets lead poisoning?

## ▶ Children

- Mother → child during pregnancy
- BLL Peaks at 18 – 36 months slow decline
  - “Tank is full” (i.e. bones are saturated)
  - Competes with calcium in bones

## ▶ Adults

- Industrial
  - battery recycling / electronics
  - Mining



<http://www.marin.ca.gov/depts/hh/main/images/hs/bfu088.jpg>



# Risk factors for lead poisoning

- Younger age
- Male gender
- Housing stock with lead-based paint (policy of “safe” housing)
- Dust / soil lead level
- Race (may reflect poverty or low SES)
- Multiple housing units or living in rental property
- Hand-mouth activity in the child





# Cutoff values

## CDC

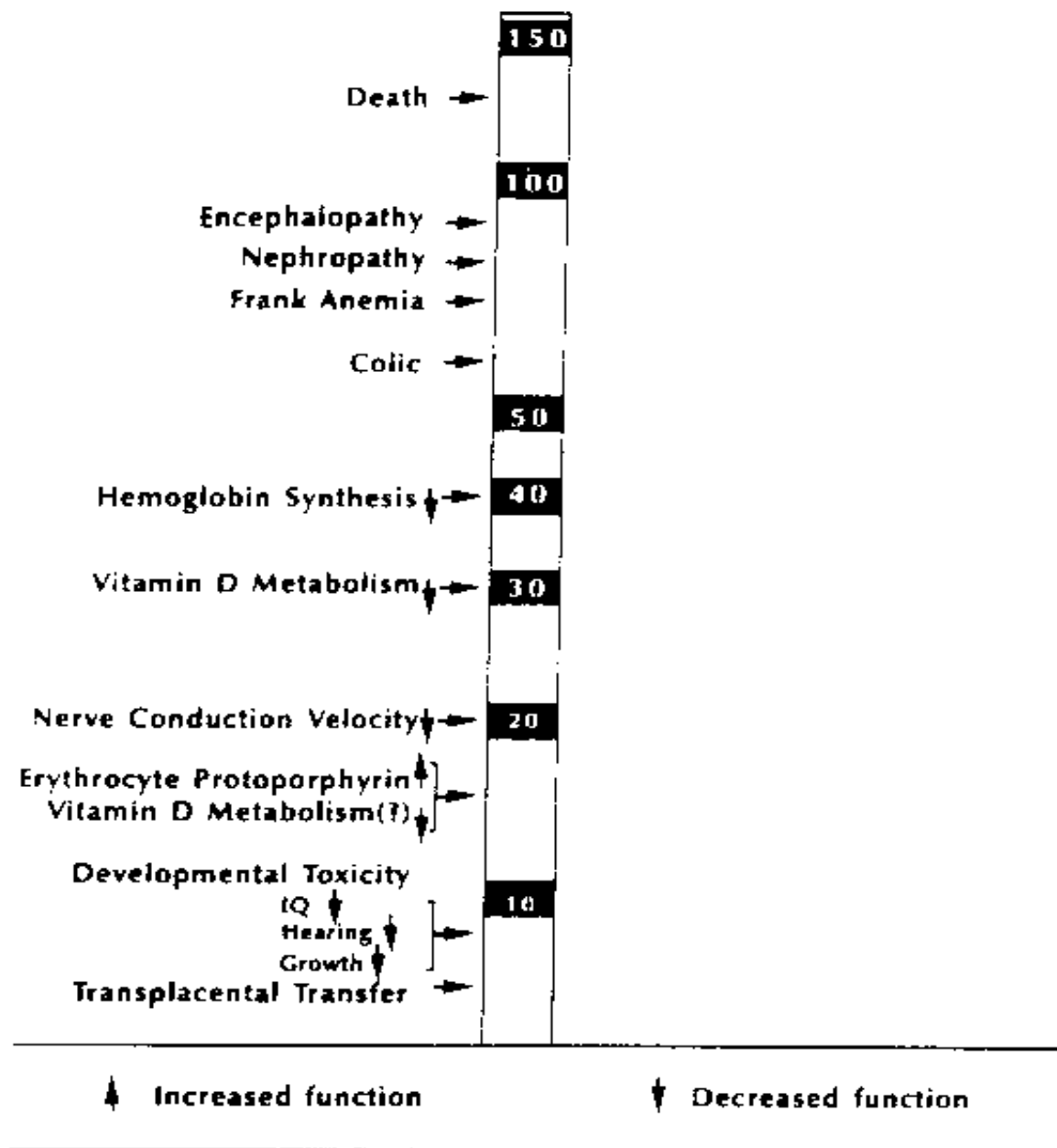
- ▶ Blood lead < 10 ug/dl

## US EPA

- ▶ Soil lead < 1,200 mg/kg
- ▶ Flood dust < 40  $\mu\text{g}/\text{ft}^2$
- ▶ Window sill dust < 200  $\mu\text{g}/\text{ft}^2$



**Figure 2-1. Lowest observed effect levels of inorganic lead in children\***



# First Large-Scale Suggestion of Toxicity at “low” level

**For every 1 µg/dL increase in blood lead:**

- **0.7-point decrement in mean arithmetic scores**
- **1-point decrement in mean reading scores**
- **0.1-point decrement in non-verbal reasoning**
- **0.5-point decrement in short-term memory scores**

**An inverse relationship between blood lead concentration and arithmetic and reading scores**


Lanphear, et al. *Public Health Reports* 2000 (115); 521–529.



# Additional Suggestions of Toxicity at “low” levels

- ▶ Prospective study followed
  - 172 children < 60 months
- ▶ Each 10  $\mu\text{cg}$  increase saw a 4.6 point IQ decrease ( $p=0.004$ )
- ▶ For children increasing from 1  $\mu\text{cg}$  to 10  $\mu\text{cg}$ , average IQ decrease = 7.4 ( $p=0.003$ )
- ▶ Are we looking at the correct epidemiology?

# IHS Lead Screening Workgroup Recommendations

- ▶ All children in IHS get screened for lead at 12 and 24 months or 36 months if not done previously.
  - ▶ Clinicians ordering the test should follow-up on elevated BLLs or designate a case manager to do so.
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# IHS Screening Recommendations (cont'd)

- ▶ Children with BLLs  $\geq 10$   $\mu\text{g}/\text{dl}$  need to be verified through a repeat blood draw.
- ▶ Children with BLLs 10 to 15  $\mu\text{g}/\text{dl}$  should receive education and follow-up every 3 months until their BLL falls below 10  $\mu\text{g}/\text{dl}$ .
- ▶ Children with BLLs between 15 and 19  $\mu\text{g}/\text{dl}$  or those with BLLs  $\geq 20$   $\mu\text{g}/\text{dl}$  should receive home visits by:
  - Public Health Nursing
  - Environmental Health
  - Head Start medical staff if enrolled in Head Start
- ▶ Children with levels  $\geq 45$  need immediate attention