

Lead: A brief discussion

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What is lead?

Lead is a neurotoxin that causes particular damage to the developing brain.^{1,2} Lead poisoning peaks at about 2 years of age.¹⁻³



Children are mainly exposed to lead by:

- Orally ingesting deteriorated lead-based paint²
 - More than half the homes in the United States built prior to 1950 contained lead-based paint²
- Inhaling or ingesting lead-contaminated dust²

Children can also be exposed to lead via:

- Lead-contaminated water, soil, or air²
- Plastics for food containers and toys containing lead²
- Traditional medicines, cooking materials, candies, or spices imported from other countries containing lead²



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Lead Exposure through a Health Equity Lens | 2017

Why is childhood lead exposure important?



Adverse outcomes are irreversible through intervention. There is currently no effective treatment.^{2,4-7}

Exposure can lead to:

- Decreased IQ and ability to concentrate^{1,2,8-10}
- Poor executive control – difficult to follow directions, control behavior and moods
- Downstream effects
 - Seven times more likely to have hypertension¹¹
 - Twice more likely to die from cardiovascular disease¹²

Lead exposure is also expensive.

It is estimated that lead-related **health care costs \$43.5 billion/year** and that \$50 billion/year is lost due to decreased economic productivity resulting from reduced cognitive potential.^{2,13}



Lead paint hazards

- Homes built before 1978, the year lead was removed from household paints
- ~71% of all housing units in suburban Cook built before 1978¹⁴
- Windows, doors, porches, garages



Non-paint hazards



- Imported candies, especially from China and Mexico
- Imported pottery, especially from Mexico
- Imported makeup- Kohl, kajal, surma
- Imported spices - turmeric
- Folk or alternative medicines
- Pipes – although water is much smaller risk than paint



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Historical risk

- Lead was added to paint to increase durability and vibrancy; banned from household paint use in 1978
- Lead was added to gasoline to reduce engine wear; phased out starting in 1970's, banned altogether by mid-90s
- Lead pipes used in household piping and water delivery until 1986 in Chicagoland



Case study: Supplement recall

- No paint-based lead hazards detected during our home risk assessment
- Tested supplements given to the child; reported results to FDA
- FDA analysis confirmed that DHZC-2 samples contained 56 times the amount of lead above that which would pose a health risk for children
- Product recall initiated
- Collaboration among U.S. Food and Drug Administration, the Cook County Department of Public Health and the City of Chicago Department of Public Health



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Identifying children with elevated lead levels

Blood lead testing is the only way to identify children with elevated blood lead levels.

The law requires physicians to screen all children under six for exposure risk using a questionnaire.

Blood lead testing is required for:

- Children residing in in IDPH-designated High Risk ZIP Codes
- Children who answer “YES” or “I DO NOT KNOW” to any question on the screening tool
- Children receiving services from Medicaid, Head Start, All Kids, Women, Infants and Children (WIC), prior to 12 and 24 months



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Burden of lead poisoning in suburban Cook County

- CCDPH study of blood lead results 2009-2013 found ~9% of all children in suburban Cook County with test results at or above 5 μ g/dL
- NHANES data from 2007-2010 estimated that the percentage of children ages 1-5 years with BLLs at or above 5 μ g/dL was 2.6%

Rates in our jurisdiction are nearly **4 times** the national estimate¹⁵



Case criteria



- CCDPH provides services to:
 - any child or pregnant woman with a blood lead level of $10\mu\text{g}/\text{dL}$ who resides in CCDPH's suburban Cook County jurisdiction
 - Any child or pregnant woman referred to the department with a blood lead level less than $10\mu\text{g}/\text{dL}$
 - Governed by Illinois law and rule



CCDPH multi-disciplinary lead team

Environmental Health Unit	<ul style="list-style-type: none">• Lead risk assessments to identify home lead hazards• Mitigation notice creation and follow up, including monitoring completion of work by home owners not in grant program• Clear all properties once hazards remediated• Coordination of grant-funded remediation in homes
Lead Poisoning Prevention Unit	<ul style="list-style-type: none">• Case referral and capillary test follow up• Manage remediation grants – locally and federally funded programs• Outreach and education (providers, partners, parents)• Quality Improvement initiatives• Policy development activities
Integrated Health – Nursing Services	<ul style="list-style-type: none">• Nursing case management, including:<ul style="list-style-type: none">○ home visit○ nutritional assessment○ developmental assessment and referral○ health and social service referral• Blood lead level and health monitoring• Service coordination with primary physician

Nursing case management

- Home visit and case management required for any child 6 years or younger and pregnant persons with a venous lead ≥ 10 $\mu\text{g}/\text{dL}$. (LPPA and rule)
- All visits and follow-up conducted by RNs (requirement LPN)
- Initial home visit includes:
 - Nutritional, physical, behavioral, and developmental assessment and education
 - Referrals (WIC, Early Intervention, etc.)
- Case management:
 - Coordination with primary care provider
 - Case follow up until 2 test results under $10\mu\text{g}/\text{dL}$
 - Follow up on referrals given



Lead risk assessment

CCPDH lead risk assessors provide:

- Lead inspection/risk assessment in every room using XRF to test for lead in painted
- Identification of hazards – places where lead paint is broken, peeling, creating dust
- Interview with parent/guardian to determine other potential sources



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If lead paint hazards are found:

- Inspectors issue a mitigation notice to the property owner.
- Legal document that requires correction within 30-90 days.
- Lead risk assessor clears property post-correction – tests to ensure lead hazards no longer present
- If owner does not mitigate:
 - Lead Poisoning Prevention Act gives us authority to seek enforcement through the Cook County states' attorney.
 - Civil and/or criminal penalties
 - Fines up to \$5000/violation



Grant program – mitigation assistance for cases (EBL 10+)

- Cook County Lead Poisoning Prevention Grant Program
 - Locally funded
 - Income-qualifying home owners receive abatement /mitigation of lead hazards
 - Over 1,000 remediated in 12 years
 - CCDPH coordinates work for suburban Cook County units, and grants funds to municipalities that applied for funding:
 - Grantees in 2018:
 - City of Chicago
 - City of Evanston
 - Village of Oak Park



Community outreach and policy work

- Medical provider education
- Child care provider education
- Technical assistance with municipalities
 - Consolidated plans
 - Lead action plans
 - Permitting and housing inspection
- Policy research
 - 50 state study looking at automatic eligibility for Early Intervention catalyzed work in IL to include lead poisoning



Program expansion

- CDC advisory committee recommendation – currently 5 μ g/dL.
- CCDPH working to hire staff needed to provide services and create the ordinance necessary for enforcement at lower blood lead levels
 - Lowering the intervention level to 5 μ g/dL would add approximately 1500 new cases per year¹⁶



New dollars – support for mitigation at lower blood lead levels

- Federal funds awarded in 2017 to collaboration of Cook County agencies – CCPDH and Bureau of Economic Development
- Mitigation of over 100 units over the next three years
- Priority population – children with blood lead levels 5-9 $\mu\text{g}/\text{dL}$ living in 10 high risk communities – blood lead levels lower than current case criteria in IL
- Moves toward primary prevention



Thank you

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