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Lead Poisoning in Children. An International Problem with Long Term Effects

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Lead Poisoning in Children. An International Problem with Long Term Effects

Abstract

Lead poisoning is a world-wide problem that can affect children from all geographic communities and socioeconomic levels. Effects of lead poisoning often have long term negative effects on academic achievement and behavior. Lead poisoning is preventable; however, as educators it is often not on our radar.

Disciplines

Education

Comments

Presented at the Ontario Council for Exceptional Children's 2015 International Conference in Niagara Falls, Ontario, Canada, on November 13 2015.



Lead Poisoning in Children.
An International Problem with Long Term Effects
Ontario Council for Exceptional Children
November 13, 2015
Dr. Susan M. Schultz
St. John Fisher College



Researcher's Stance



How Does Lead Poisoning Occur?

- ☞ Inhalation or ingestion
 - ☞ Gets into the blood stream
 - ☞ stored in organs, tissues, bones, and teeth
- ☞ Suddenly or slowly over time

(Center for Disease Control and Prevention, 2014)

But isn't lead banned?



- ❧ In Canada, lead has been banned
 - ❧ from paint in 1976
 - ❧ from in gasoline in 1990

- ❧ In the United States, lead has been banned
 - ❧ from paint in 1978
 - ❧ from in gasoline in 1996

Current Causes of Lead Poisoning in Children



- ❧ Imported products (foods and items)
- ❧ Contaminated water (lead banned from new pipes)
- ❧ Paint chips or dust
- ❧ Contaminated soil
 - ❧ High traffic areas
 - ❧ Industrial pollution/ hot spots
- ❧ Ceramics
- ❧ Parent's job or hobby (lead shot, sinkers, stained glass, white lead -boat repair...)

Acceptable Lead Levels



- ☞ Currently, over 450,000 children in the United States have blood lead levels greater than 5 micrograms per deciliter. (1/38 children)
- ☞ Most children in Canada fall below the 10/dL level
 - ☞ “The prevalence of neurotoxic lead levels in asymptomatic children in Canada is unknown” (Feldman & Randel, 2015, p. 267)
 - ☞ Data - surveys over the past 5 years- variation in reporting
 - ☞ Local differences exist.



- ❧ Health Canada 10 micrograms per deciliter
- ❧ Center for Disease Control benchmark is 5 micrograms per deciliter
 - ❧ decreased in June 2012
- ❧ Canada- **point studies and statistics**
 - ❧ Differences between the 2 countries exist primarily because blood lead surveillance data for US children were readily available and easily accessible, whereas these data for Canadian children were relatively sparse and inaccessible (American Journal of Public Health, 2011- University of Ottawa).
- ❧ **No exposure to lead is safe**

Why Are Children More at Risk?



- ☞ Quickly developing brains and bodies absorb lead at a higher rate.
- ☞ Can be exposed prenatally
- ☞ Children crawl around on the floor, put their hands in their mouths, eat non-edibles...

Effects of Lead Poisoning



- ❧ Irreversible cognitive and neurobehavioral abnormalities
 - ❧ Reduced IQ
 - ❧ Attention Deficit Disorder
 - ❧ Delayed development
 - ❧ Learning problems
 - ❧ Smaller physical size
 - ❧ Neuropathy, central nervous system damage, seizures
 - ❧ Renal dysfunction

Disproportionality by Income and Race



- ❧ Poverty/low income areas
- ❧ Dwindling resources/ low on the public health and education agendas
- ❧ Children born outside the Canada and the U. S.
- ❧ Children living/back for 6 months or less

- ❧ Can affect any geographic area, ethnicity or income bracket.

Academics



Prenatal Exposure

- ☞ Effects diminish by the end of preschool
- ☞ Visual Spatial
- ☞ Attention

Post-natal Exposure

- ☞ Long term effects (even low levels affect development)
- ☞ Contributes to the achievement gap

Research on Academics



Longitudinal studies of Early Childhood Exposure:

- ❧ Lower educational achievement, more effect on reading than math (North Carolina)

(Miranda, Kim, Overstreet Galeano, Paul, Hull & Morgan, 2007)

- ❧ The higher a student's blood lead level was in early childhood, the worse he or she performed on tests in Grades 3, 5 and 8 (Detroit).

(Zhang, N., Baker, H. W., Tufts, M., Raymond, R. E., Salihu, H., & Elliott, M. R., 2013)

- ❧ Cognitive function is affected before any signs of gross motor impairment are seen. Low levels of lead caused cognitive impairments-cognition more sensitive than motor (rural Maryland)

(Thatcher, Lester, McAlaster, Horst and Ignasias. 1983)

Lead Poisoning and Behavior



- ☞ Increased risk for teacher rated externalizing and school behavior problems and parent rated behavioral symptoms index (Chen, Cai, Dietrich, Radcliffe, & Rogan, 2007).
- ☞ Both prenatal and postnatal lead poisoning was associated with antisocial acts and delinquency. The researchers recruited 216 adjudicated delinquent youths from the Cincinnati Lead Study ages 15-17.

(Dietrich, Ris, Succop, Berger, and Bornschein, 2001)

Lead Poisoning and Behavior



- Wright, Dietrich, Ris, Hornung, Wessel, Lanphear, Ho, and Rae (2008) followed lead exposed children into young adulthood. (Cincinnati)
- Compared the arrest records of 250 individuals aged 19-24, who were recruited at birth between 1979 and 1984 in lead exposure study
- . The researchers identified a total of 800 arrests, with 108 for violent offenses, with no significant difference by sex.



- Needleman, McFarland, Ness, Fienberg, and Tobin (2002) conducted a similar study of 194 adolescents aged 12-18 in Alleghany County, Pennsylvania, and did not find delinquent behavior confined to one race or ethnicity.
- Their data showed an “association between lead at asymptomatic doses and adjudicated delinquency” (p. 716).

Children with Special

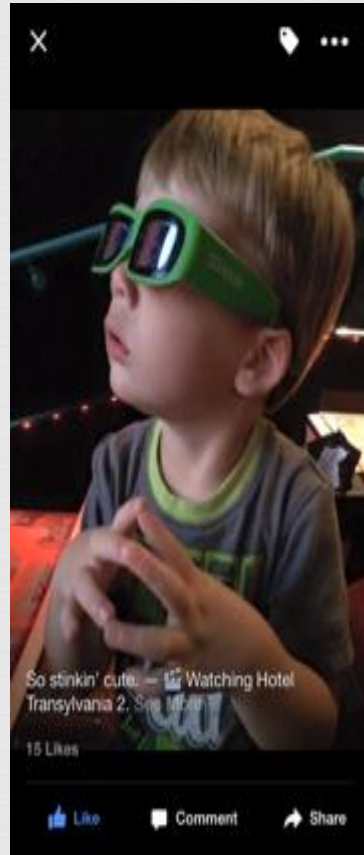


Where's Ethan?

Ethan's Birthday



Where's Ethan today...



Will the outcomes be the

(Thayer, 2015)



Prevention is Multifaceted and Interdependent

☞ Education and Awareness

- ☞ Family
- ☞ Medical practitioners
- ☞ Educators

☞ Environmental Clean Up

☞ Hygiene

- ☞ Personal
- ☞ Removing shoes at the door
- ☞ HEPA vacuuming in homes
 - ☞ 1 time a week or more if you own indoor/ outdoor pets

☞ Product recalls www.recalls.gov

☞ Healthy balanced diet

- ☞ Children who have insufficient calcium, iron and zinc tend to absorb more lead (Currie, 2005).

Point of Need



- ❧ Ask about lead poisoning history at point of entry in schools/ medical follow up.
- ❧ Early Intervention/ Special Education services if eligible
- ❧ Classroom accommodations and modifications
 - ❧ Preferential seating
 - ❧ Classroom buddies
 - ❧ Support as needed (speech/ language therapy, social skills groups..)
 - ❧ Behavior plan (class or individual)
 - ❧ Enrichment opportunities

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For a copy of the presentation:

