Childhood Lead Poisoning in NH:

Carroll County Community Leaders Need to Know

September 23 2019

Gail Coppins Gettens, MS, ECMP
gail.gettens@dhhs.nh.gov
Child Development Specialist
Health Promotion Advisor
NH Division of Public Health Services
Healthy Homes and Lead Poisoning Prevention Program
603.271.1393

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Funded by Center for Disease Control
28 Programs within the United Stated

HEALTHY HOMES
& LEAD POISONING
PREVENTION PROGRAM

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

New Hampshire 2012 – 2017

Average of *over 800 children* annually
with EBLL greater than 5 µg/dl.

Fewer than 17% of children under 6 years
In NH have had BLL test.

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Carroll County Public Health Network

5 yr. average – 22 *new* children annually with BLL 5 µg/dL or higher

111 *new* children with EBLL's – 2014 – 2018

***Under reported* – very low testing rates in many communities in your area**

508

AGENDA

History – Why this is still an issue in US and NH?

Sources of Exposure – How are NH's children's poisoned?
Negative Impact on Child's Developing Brain
Lead's *Neurobehavioral Signature*

Long Term Consequences – Cincinnati Lead Study
Burden and Costs – Schools and Communities
Early Intervention, Special Education, Criminal Justice System

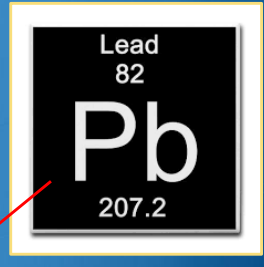
NH Low Testing Rates and Testing Options
Recent Legislative Changes in NH

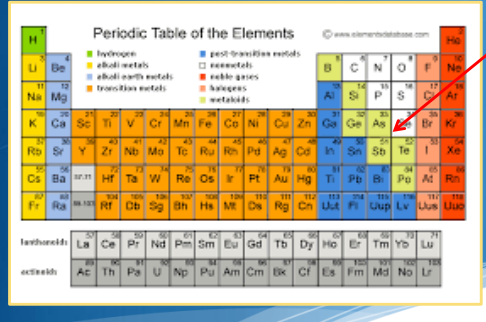
Federal - EPA – RRP Law (Renovate, Repair, Paint)
NH SB 247 – April 9, 2018 – Universal Testing
Action Steps for Change

What is Lead?

What is its source?

How is it used?





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How Are NH Children Being Poisoned?

62% of New Hampshire's housing stock was built before lead in residential was banned.

History of Lead Poisoning

- 1892 – Australia
  Epidemic of childhood lead poisoning – lead paint
- 1909 - France and Austria banned white lead interior paint
- 1922 – Tunisia and Greece followed the ban
- 1926 - Great Britain and Sweden banned interior lead paint
- 1927 – Poland banned all lead –based paint.
- 1931 – Spain and Yugosalvia

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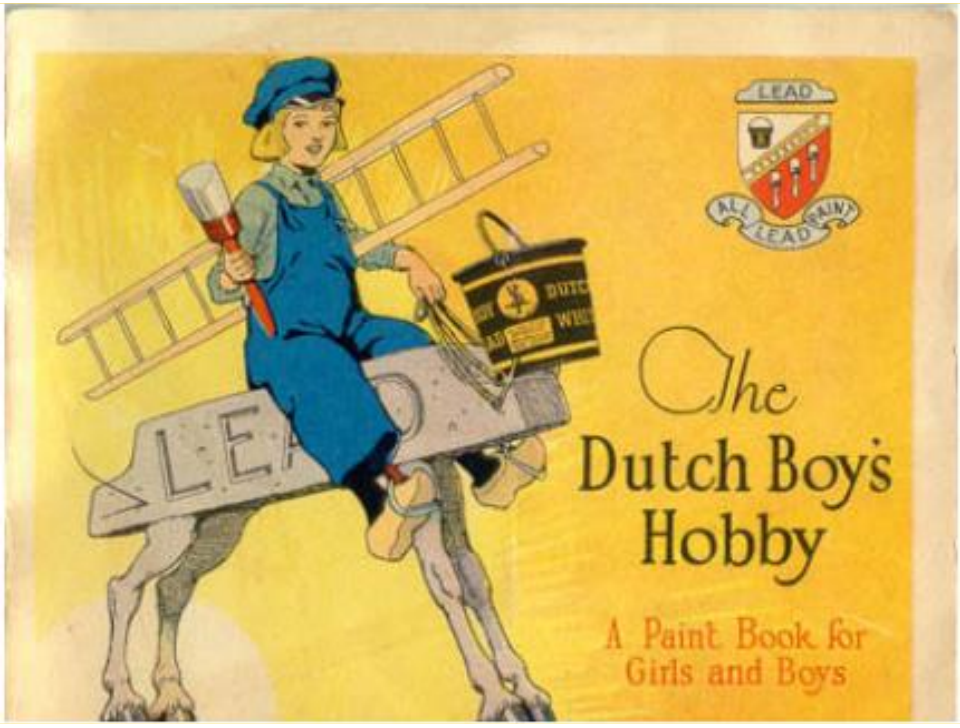
History of Lead Poisoning

- 1914 – United States – first reported child death from lead poisoning
- 1922 – League of Nations – treaty to ban lead in paint
  All participating nations sign - US declines adopt
- 1940's – US research demonstrates - if recovered from acute toxicity - significant deficits.
- 1970's – US research demonstrates cognitive and behavior deficits with no clinical signs of toxicity.
- 1978 – Federal legislation ban its use in residential paint.



Perfect Storm

Don't see deficits and impact until older

No Brain-Blood

Developing Brain

Sweet Tasting

Trace Amounts

Oral Stage

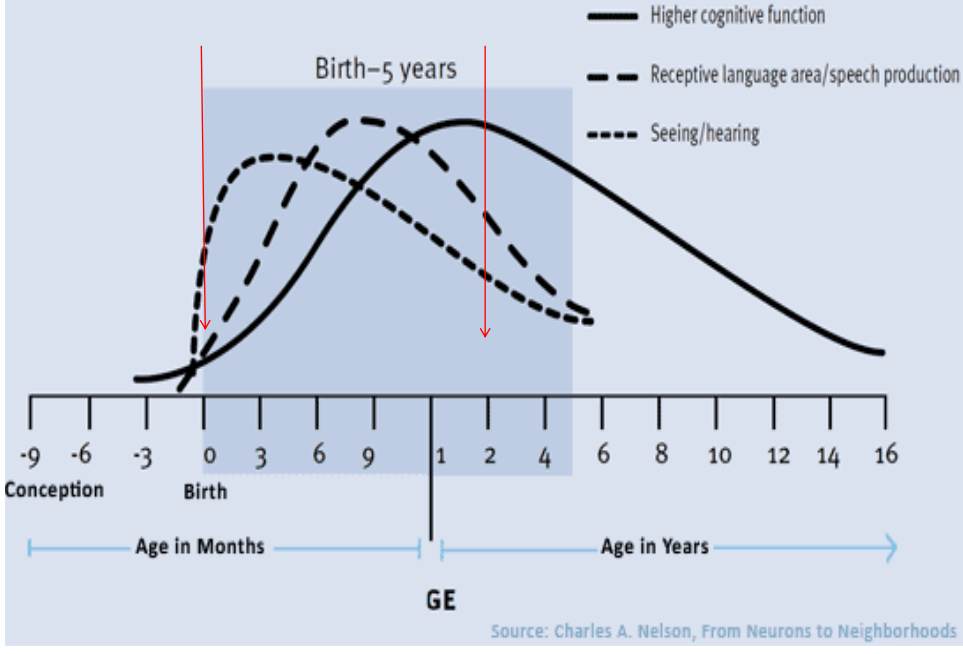
No Immediate Symptoms

Crawl on Floors and Pull to Standing - Surfaces Where Lead Dust Collects

Perfect Pediatric Poison

Potent Neuro-Toxicant

Synapse Formation in the Development Brain



RSA 130.A

Current Rules in NH

- Elevated Blood Lead Level – 3 μg/dL – ***7.4*** – education
- Elevated Blood Lead Level – ***7.5*** μg/dL or greater
  - Public Health Nurse – visits and case management
  - Katie Hatcher, RN – Statewide Coordinator
  - Manchester and Nashua Health Departments.
  - Lead Inspector – visits to identify lead hazards – both use of XRF and water tests
  - If lead hazards found in rental unit – 'under order' and landlord required by law to do lead hazard reduction.

Senate Bill SB247 – lowered public health 7-1-19.
Will lower again 7-1-21 down to 5 μg/dl.

How Much Lead Does It Take To Poison A Child?

Demonstration

Lead's exposures negative impact on a child's developing brain is irreversible.

There is no cure. There is no treatment.

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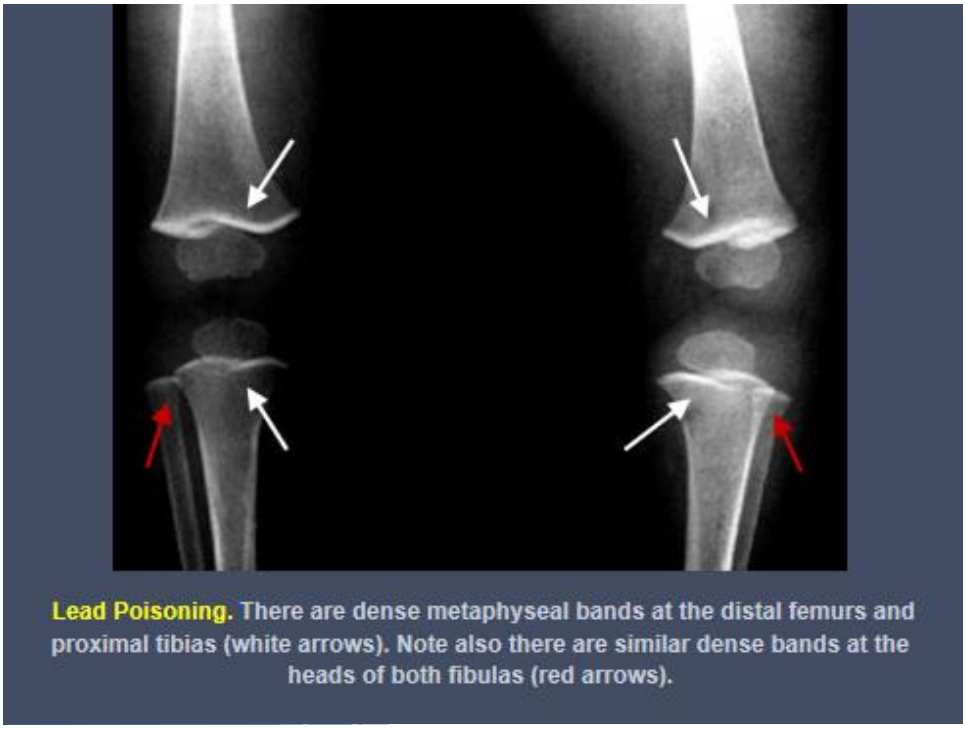

Lead Poisoning. There are dense metaphyseal bands at the distal femurs and proximal tibias (white arrows). Note also there are similar dense bands at the heads of both fibulas (red arrows).

What does Gray Matter Loss in a Child's Brain Look Like?

Brain Scan of EBLL of 13.4 mcg/dl – male child

Dr. Kim Cecil – Cincinnati Lead Study

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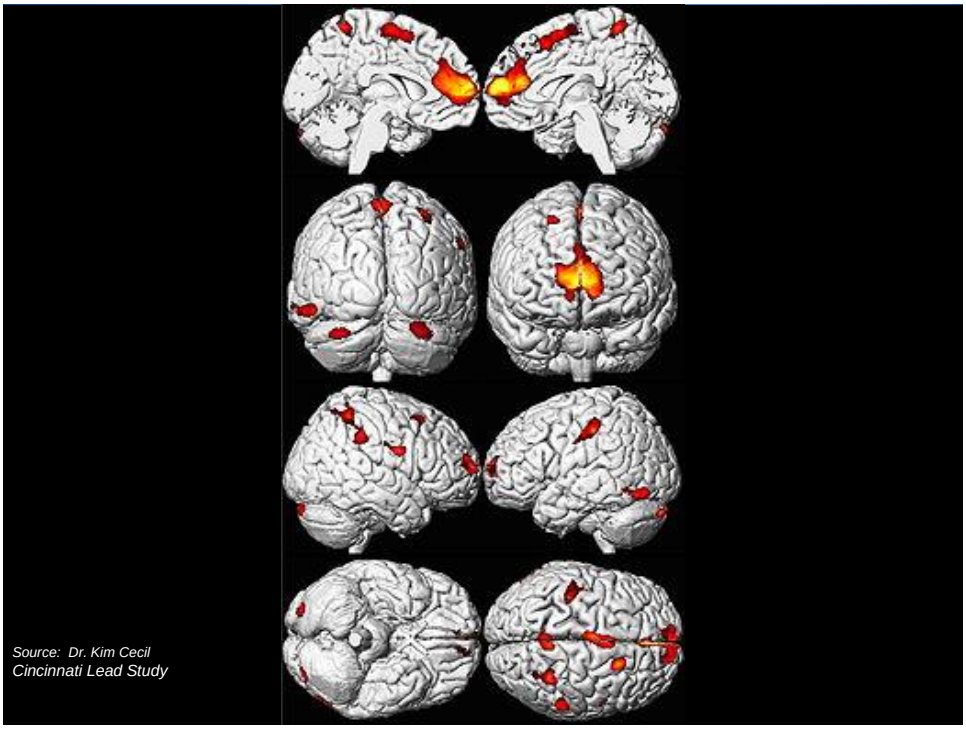

Source: Dr. Kim Cecil
Cincinnati Lead Study

https://mass.pbslearningmedia.org/resource/nvpw-sci-leadexposure/wgbh-nova-poisoned-water-the-health-impacts-of-lead-exposure/#.WUrNsNKGPb0

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Lead Exposure's Negative Impact On Specific Abilities

- Early childhood lead exposure has large negative and adverse consequences on behavior, increasing impulsivity and aggression.
- Lower IQ. Lower or failing test scores
- Poor school performance and achievement
- Behavior problems
- These effect persist, from childhood through adulthood

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Lead's NeuroBehavioral Signature

Lead Exposure's Negative Impact On Specific Abilities

- **Attention** – *inattentive, impulsive, Hyperactive/ADD, distractibility, poor organization, lack of persistence in completing tasks*
- **Executive Function** - *deficits in areas of strategic planning, control of impulses, flexibility of thought, self-monitoring of one's own behaviors and emotions*
- **Visual/Spatial** - *poor memory and organization abilities, reasoning with visually presented - non-verbal problems. Presents as deficits in reading and math*

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Lead's NeuroBehavioral Signature

Lead Exposure's Negative Impact On Specific Abilities

- **Behavior Challenges** - *impulsivity, emotional regulation, anti-social behaviors, oppositional, aggression, destructive behaviors.*
- **Speech and Language** - *delays and deficits. Language processing deficits, hearing deficits*
- **Fine and Gross Motor** - *Poor balance, poor coordination, lack of bilateral coordination, clumsiness and unsteadiness, higher rate of injury.*

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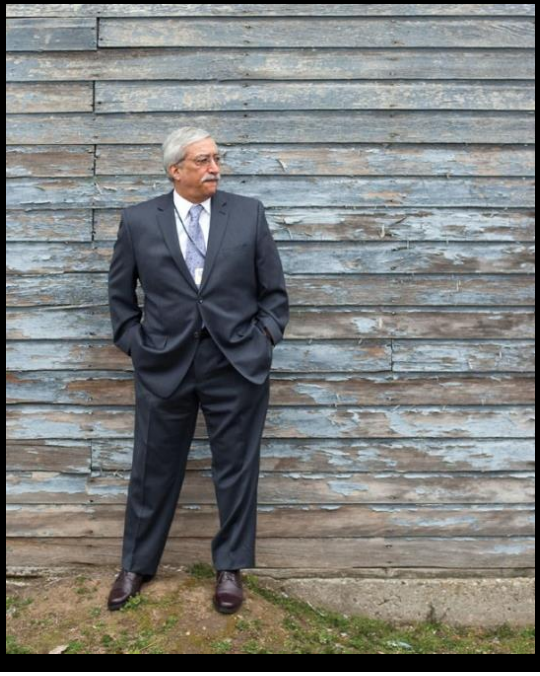
Long Term Consequences of Lead Exposure

Societal Cost of Lead

- Special Education
- Risky Behaviors
- Teen Pregnancy
- School Suspensions
- High School Drop Out
- Substance Abuse
- Juvenile Delinquency/Detention
- Child Abuse and Neglect
- Adult Criminal Activity

Ralph Spezio ~ Superintendent of Schools ~ Rochester, NY



41%

100%

September 6, 2019

EDUCATION WEEK

In Flint, Schools Overwhelmed by Special Ed. Needs in Aftermath of Lead Crisis

Tracking the Growth of Special Education in Flint

The percentage of students who qualify for special education services in Flint has grown from 13.1 percent in the school year before the water became contaminated to 20.5 percent last school year.

2012-13: **13.1%**

2013-14: **15.1%**

2014-15: **15%**

2015-16: **16.7%**

2016-17: **17.4%**

2017-18: **19.8%**

2018-19: **20.5%**

Source: Michigan Department of Education

How Are Children Being Poisoned?

60% of New Hampshire's housing stock was built before lead in residential was banned.

How Are Children Being Poisoned?

- Friction Surfaces: window and door jams, floors and stair treads
- Rental Properties that are not well maintained
- Lead contaminated soil
- Lead passed from mother to fetus.
- DIY (Do-It-Yourself) renovations
- Contractors not following lead-safe work practices
- 1 in 3 children poisoned during renovations

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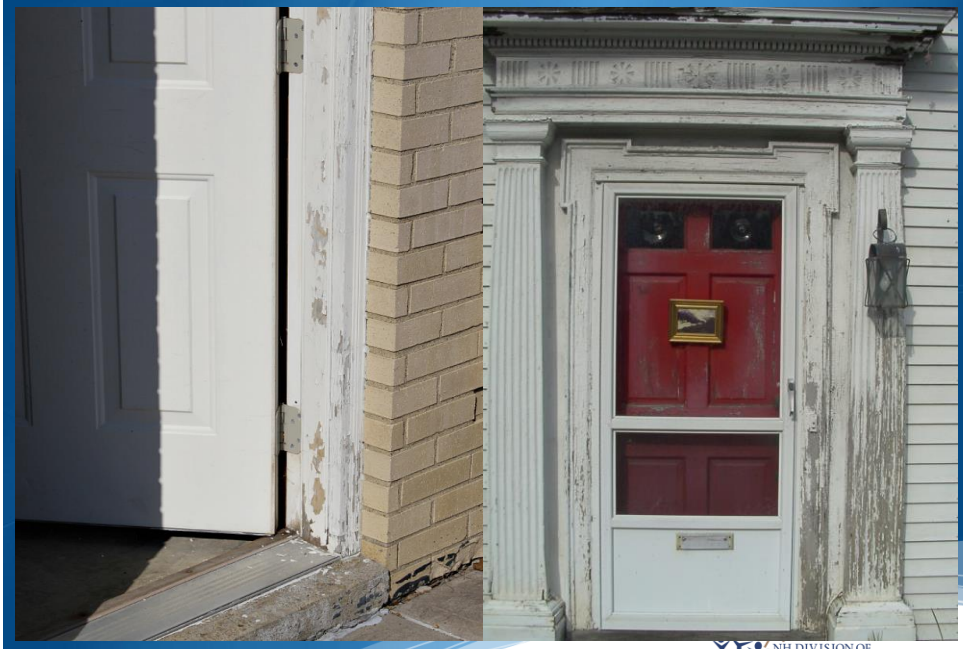

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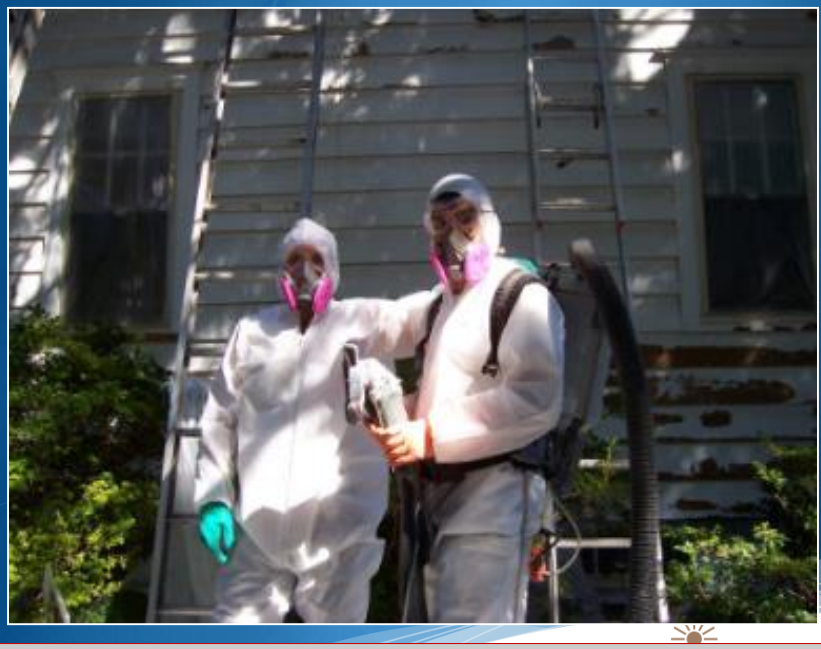
2010 – EPA RRP Law
Renovate, Repair, Paint

1 in 3 children are poisoned during a renovation



Call and report unsafe work practices. Local Health Officer. Take a photo of vehicle


42 33
HGTV
1 in 3 children are poisoned during a renovation

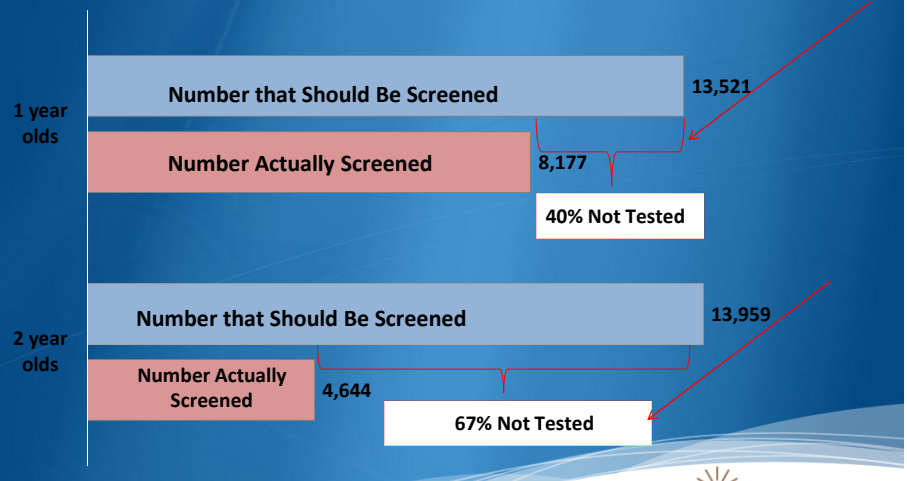

1 in 3 children are poisoned during a renovation
HGTV

NH Legislative Updates: Childhood Lead Poisoning and Prevention

Senate Bill SB247

Signed into law by Gov. Sununu on February 8, 2018
Universal BLL Testing in NH – ***effective*** April 9, 2018

NH Statewide Testing Rates 2016



Source NH DPHS – Surveillance Report 2016

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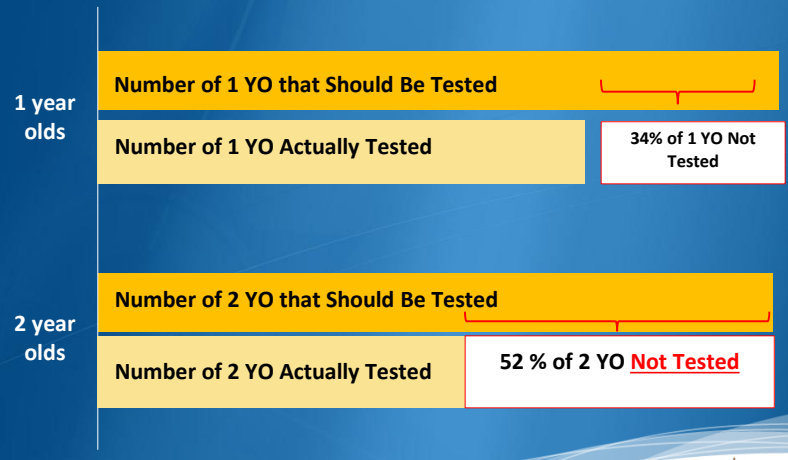
Carroll County PHN - 2018

Blood Lead Level Testing - 1 and 2 Year Olds



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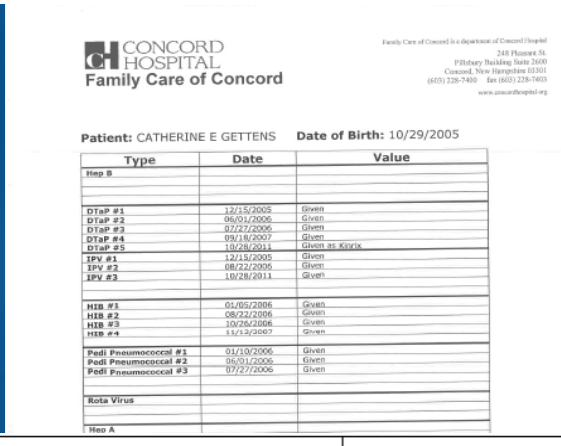


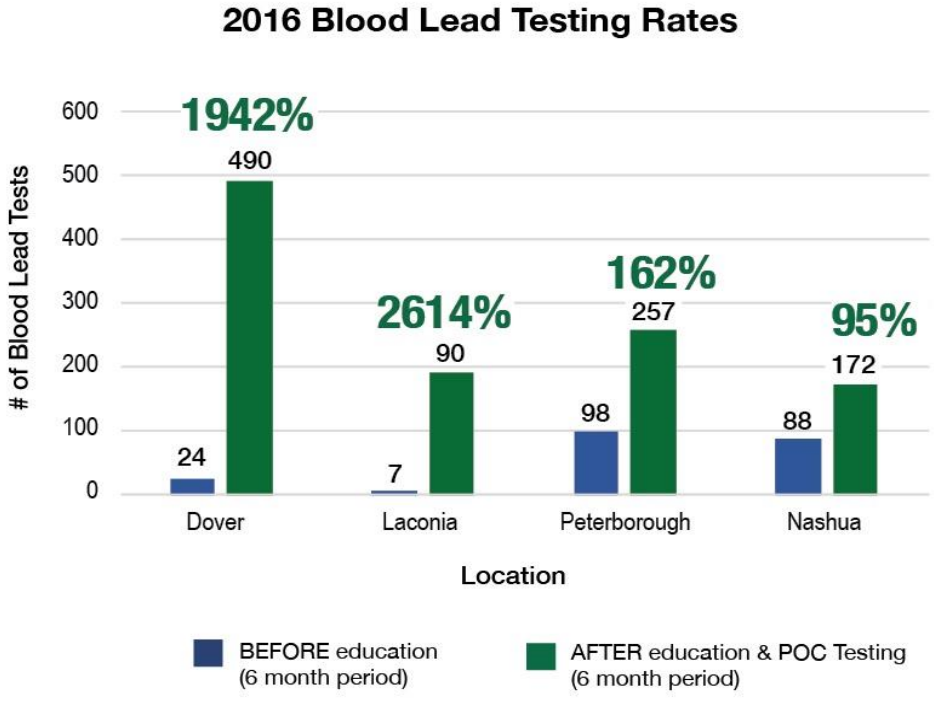
CONCORD HOSPITAL
Family Care of Concord

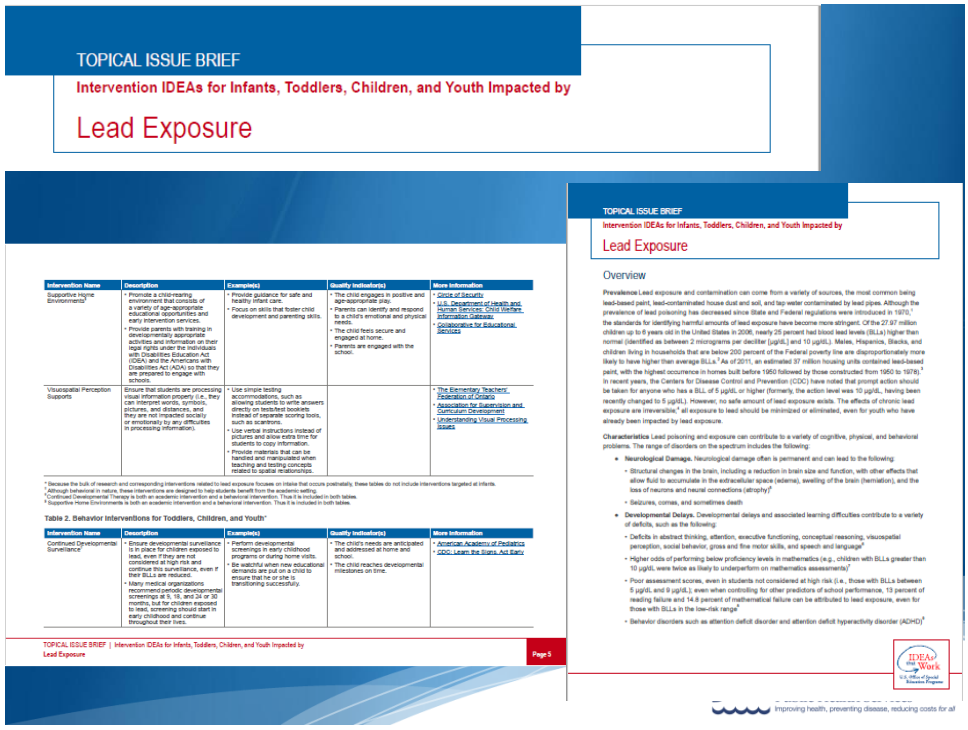
Patient: CATHERINE E GETTENS Date of Birth: 10/29/2005

Type	Date	Value
Hep B		
DTaP #1	12/15/2005	Given
DTaP #2	06/01/2006	Given
DTaP #3	07/27/2006	Given
DTaP #4	09/18/2007	Given
DTaP #5	10/28/2011	Given as Kinrix
IPV #1	12/15/2005	Given
IPV #2	08/22/2006	Given
IPV #3	10/26/2011	Given
HIB #1	01/05/2006	Given
HIB #2	08/22/2006	Given
HIB #3	10/26/2006	Given
HIB #4	11/13/2007	Given
Pedi Pneumococcal #1	01/10/2006	Given
Pedi Pneumococcal #2	06/01/2006	Given
Pedi Pneumococcal #3	07/27/2006	Given
Rota Virus		
Hep A		

Pediatric Labs		Most Current
Lead Level:	Required at ages 1 & 2	
Hgb:	Required yearly through age 5	
Fluoride:	Water Source: Town Fluorinated (Concord or Penacook) on 09/21/2009 No documented Fluoride result	


LeadCare II
A NH Success Story: Increasing BLL Testing Rates


2016 Blood Lead Testing Rates
# of Blood Lead Tests
600
500
400
300
200
100
0
1942%
490
24
2614%
90
7
162%
257
98
95%
172
88
Dover
Laconia
Peterborough
Nashua
Location
BEFORE education
(6 month period)
AFTER education & POC Testing
(6 month period)



TOPICAL ISSUE BRIEF

Intervention IDEAs for Infants, Toddlers, Children, and Youth Impacted by

Lead Exposure

Intervention Name	Description	Example(s)	Quality Indicator(s)	More Information
Supportive Home Environments[3]	• Promote a child-rearing environment that consists of a variety of age-appropriate educational opportunities and early intervention services. • Provide parents with training in developmentally appropriate activities and information on their legal rights under the individuals with Disabilities Education Act (IDEA) and the Americans with Disabilities Act (ADA) so that they are prepared to engage with schools.	• Provide guidance for safe and healthy infant care. • Focus on skills that foster child development and parenting skills.	• The child engages in positive and age-appropriate play. • Parents can identify and respond to a child's emotional and physical needs. • The child feels secure and engaged at home. • Parents are engaged with the school.	• Circle of Security • U.S. Department of Health and Human Services, Child Welfare Information Gateway • Collaborative for Educational Services
Visuospatial Perception Supports	Ensure that students are processing visual information properly (i.e., they can interpret words, symbols, pictures, and distances, and they are not impacted socially or emotionally by any difficulties in processing information).	• Use simple testing accommodations, such as allowing students to write answers directly on tests/test booklets instead of separate scoring tools, such as scantrons. • Use verbal instructions instead of pictures and allow extra time for students to copy information. • Provide materials that can be handled and manipulated when teaching and testing concepts related to spatial relationships.		• The Elementary Teachers' Federation of Ontario • Association for Supervision and Curriculum Development • Understanding Visual Processing Issues

* Because the bulk of research and corresponding interventions related to lead exposure focuses on intake that occurs postnatally, these tables do not include interventions targeted at infants.
[3] Although behavioral in nature, these interventions are designed to help students benefit from the academic setting.
[4] Continued Developmental Therapy is both an academic intervention and a behavioral intervention. Thus it is included in both tables.
[5] Supportive Home Environments is both an academic intervention and a behavioral intervention. Thus it is included in both tables.

Table 2. Behavior Interventions for Toddlers, Children, and Youth*

Intervention Name	Description	Example(s)	Quality Indicator(s)	More Information
Continued Developmental Surveillance[4]	• Ensure developmental surveillance is in place for children exposed to lead, even if they are not considered at high risk and continue this surveillance, even if their BLLs are reduced. • Many medical organizations recommend developmental screenings at 9, 18, and 24 or 30 months, but for children exposed to lead, screening should start in early childhood and continue throughout their lives.	• Perform developmental screenings in early childhood programs or during home visits. • Be watchful when new educational demands are put on a child to ensure that he or she is transitioning successfully.	• The child's needs are anticipated and addressed at home and school. • The child reaches developmental milestones on time.	• American Academy of Pediatrics • CDC: Learn the Signs. Act Early

TOPICAL ISSUE BRIEF | Intervention IDEAs for Infants, Toddlers, Children, and Youth Impacted by Lead Exposure

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TOPICAL ISSUE BRIEF

Intervention IDEAs for Infants, Toddlers, Children, and Youth Impacted by

Lead Exposure

Overview

Prevalence Lead exposure and contamination can come from a variety of sources, the most common being lead-based paint, lead-contaminated house dust and soil, and tap water contaminated by lead pipes. Although the prevalence of lead poisoning has decreased since (State and Federal regulations were introduced in 1970,[1] the standards for identifying harmful amounts of lead exposure have become more stringent. Of the 27.97 million children up to 6 years old in the United States in 2016, nearly 25 percent had blood lead levels (BLLs) higher than normal (identified as between 2 microgramx per deciliter [µg/dL] and 10 µg/dL). Males, Hispanics, Blacks, and children living in households that are below 200 percent of the Federal poverty line are disproportionately more likely to have higher than average BLLs.[2] As of 2011, an estimated 37 million housing units contained lead-based paint, with the highest occurrence in homes built before 1950 followed by those constructed from 1960 to 1978).[3] In recent years, the Centers for Disease Control and Prevention (CDC) have noted that prompt action should be taken for anyone who has a BLL of 5 µg/dL or higher (formerly, the action level was 10 µg/dL, having been recently changed to 5 µg/dL). However, no safe amount of lead exposure exists. The effects of chronic lead exposure are irreversible,[4] all exposure to lead should be minimized or eliminated, even for youth who have already been impacted by lead exposure.

Characteristics Lead poisoning and exposure can contribute to a variety of cognitive, physical, and behavioral problems. The range of disorders on the spectrum includes the following:

- **Neurological Damage.** Neurological damage often is permanent and can lead to the following:
  - Structural changes in the brain, including a reduction in brain size and function, with other effects that allow fluid to accumulate in the extracellular space (edema), swelling of the brain (herniation), and the loss of neurons and neural connections (atrophy)[5]
  - Seizures, comas, and sometimes death
- **Developmental Delays.** Developmental delays and associated learning difficulties contribute to a variety of deficits, such as the following:
  - Deficits in abstract thinking, attention, executive functioning, conceptual reasoning, visuospatial perception, social behavior, gross and fine motor skills, and speech and language[6]
  - Higher odds of performing below proficiency levels in mathematics (e.g., children with BLLs greater than 10 µg/dL were twice as likely to underperform on mathematics assessments)[7]
  - Poor assessment scores, even in students not considered at high risk (i.e., those with BLLs between 5 µg/dL and 9 µg/dL); even when controlling for other predictors of school performance, 13 percent of reading failure and 14.8 percent of mathematical failure can be attributed to lead exposure, even for those with BLLs in the low-risk range[8]
  - Behavior disorders such as attention deficit disorder and attention deficit hyperactivity disorder (ADHD)[9]

IDEAs that Work

U.S. Office of Special Education Programs

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Action Steps :

- Insure Children Are Tested – ***It's the law.***
- Educate on POC in-office blood lead level testing options.
- Educate *everyone* about impact of lead exposure.
- Educate school district leadership and special education professionals.
- Establish school district policy requiring BLL tests results documented on Kindergarten-entry health forms, special education preschool programs and special education referrals.

Action Steps :

- Add RRP training and certification to building trade curriculum at vocational career centers.
- Support RRP training for contractors, property owners and home owners/partner with building supply stores.
- Support compliance with drinking water testing in child care centers and schools
- Implement proactive lead risk assessments of licensed child care centers to identify and prioritize removal of lead hazards.
- Identify funding sources to remove lead hazards from pre-78 housing in the community – HUD and CDBG

Action Steps :

Assist Communities to develop ordinances:

- "to cause the repair" of buildings that are unfit for human habitation because of lead conditions.
- require landlords to obtain a permit or certificate of compliance at certain times (every 3 years); and before receiving occupancy permit.
- requiring contractors to have an EPA RRP to obtain a building permit on pre-1978 buildings.
- Adopt local building code regarding "construction, remodeling, and maintenance" of all buildings.


Questions?
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