Lead Screening and Investigations
Clark County Board of Health
September 28th, 2016

Clark County Public Health – Environmental Public Health
Four Main Topics of Lead Discussion

1. Health Effects of Pb and Sources of Exposure
2. Elevated Blood Lead Level (EBLL) Reporting
3. EBLL Environmental Investigations
4. Future Actions
Health Effects of Lead Exposure

Lead poisoning

Lead buildup in the body causes serious health problems

Symptoms
- Headaches
- Irritability
- Reduced sensations
- Aggressive behavior
- Difficulty sleeping

Additional complications for children:
- Lead is more harmful to children as it can affect developing nerves and brains
- Loss of developmental skills
- Behavior, attention problems
- Hearing loss
- Kidney damage
- Reduced IQ
- Slowed body growth

Source: MedlinePlus/Mayo Clinic

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How lead effects children’s’ health

**Brain**
Any exposure is linked to lowered IQ, ADHD, hearing loss, and damaged nerves. Acute exposures can cause convulsions, loss of body movement, coma, stupor, hyperirritability, & death.

**Heart**
Studies suggest that adults who endured lead poisoning as children had significantly higher risks of high blood pressure 50 years later.

**Blood**
Lead inhibits the body’s ability to make hemoglobin, which can lead to anemia. This reduces oxygen flow to organs, causing fatigue, lightheadedness, rapid heartbeat, dizziness, & shortness of breath.

**Stomach**
Severe lead exposure can create intense abdominal pain and cramping.

**Kidneys**
Chronic exposures can cause chronic inflammation, which can lead to kidney failure, bloody urine, fever, nausea, vomiting, drowsiness, coma, weight gain, confusion, rash, and urinary changes.

**Reproductive System**
A moderate exposure can not only lower sperm count, but also damage them. Chronic exposures can diminish the concentration, total count, and motility of sperm, though it’s unclear how long these effects last after the exposure ends.

**Bones**
Lead may impair development and the health of bones, which can slow growth in children.

Sources: Centers for Disease Control; World Health Organization
# Lead Exposure and Educational Proficiency

<table>
<thead>
<tr>
<th>Blood Lead Levels</th>
<th>Educational Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \leq 3 , \mu g/dL )</td>
<td>Lower end of grade test scores</td>
</tr>
<tr>
<td>4 , \mu g/dL</td>
<td>Increased likelihood of learning disability in elementary school</td>
</tr>
<tr>
<td>( \geq 5 , \mu g/dL )</td>
<td>30% more likely to fail third grade reading and math tests</td>
</tr>
<tr>
<td>( \geq 10 , \mu g/dL )</td>
<td>Significantly lower academic performance test scores in 4\textsuperscript{th} grade</td>
</tr>
<tr>
<td>( \geq 25 , \mu g/dL )</td>
<td>$0.5$ million in annual special education and juvenile justice costs</td>
</tr>
</tbody>
</table>

How are People Exposed to Lead?

• Drinking Water

• **Lead dust from deteriorated paint in pre-1978 homes**
  (largest source of exposure for children)

• Contaminated soil

• Occupation

• Hobbies/Lead-containing materials
Drinking Water – Lead Testing in Local Schools

- CCPH is providing school district staff with technical resources for sampling and interpreting results
- Assisting in identifying potential lead sources;
- Assisting and guiding on mitigation measures;
- Working with WA Department of Health to address the Governor’s Directive;
Public Health’s Responsibility

WAC 246-101-505 states, “Local health officers or the local health department shall review and determine appropriate action for each reported case or suspected case of a notifiable condition.”

An individual’s blood lead level becomes a notifiable condition when ≥ 5 µg/dL

= Elevated Blood Lead Level (EBLL)
EBLL Notifications

- DOH receives all lead screening/test results (labs/clinics)
- Result $\geq 5 \, \mu g/dL$ are notifiable condition & referred to LHJ/CCPH
- CCPH contacts HCP to confirm case information and notifiable condition/test result(s)
- CCPH works with HCP to implement case management protocols based on CDC recommendations
- CCPH contacts case parent/guardian to identify lead exposure
- CCPH offers EBLL Environmental Investigation

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EBLL Environmental Investigations

- Compile all data collected from HCP and case parent/guardian

- Research site data where case/child frequently spends time (age of home/building, historical property use, adjacent properties, etc.)

- Visit site location(s) to identify potential sources of lead exposure

- Since 2011, investigations are funded by the Site Hazard Assessment (SHA) grant with Department of Ecology.
Field Screening & Testing Methods

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2010 Target Shooting Club Range Investigation

- Initially received 3 EBLL notifications linked to club
- 42 hobby shooters tested for Pb (32 children & 10 adults)
- Investigation findings = inadequate air flow inside facility
- Result = club upgraded ventilation system for a safer recreational environment

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Recreational Lead Hazards

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Lead Hazards of Household Items
Lead Hazards of Household Items
Most Common Lead Hazards in Household
Most Common Lead Hazards in Household
## Estimated # of Housing Units with Lead Hazards by Housing Age in WA State

<table>
<thead>
<tr>
<th>Age of Housing</th>
<th>Lead-Based Paint</th>
<th>Lead Paint Hazards</th>
<th># Housing Units with Lead-Based Paint in WA State</th>
<th># Housing Units with Lead Paint Hazards in WA State</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Housing</td>
<td>40%</td>
<td>25%</td>
<td>2,451,075</td>
<td>472,035</td>
</tr>
<tr>
<td>Pre-1940</td>
<td>87%</td>
<td>68%</td>
<td>307,078</td>
<td>208,813</td>
</tr>
<tr>
<td>1940-1959</td>
<td>69%</td>
<td>43%</td>
<td>414,555</td>
<td>178,259</td>
</tr>
<tr>
<td>1960-1977</td>
<td>24%</td>
<td>8%</td>
<td>661,598</td>
<td>52,928</td>
</tr>
</tbody>
</table>

WA State Pre-1950 Homes & Blood Screening

Proportion of pre-1950 housing and 2012 screening rates by county, Washington

State vs. U.S. average. Sources: U.S. Census Bureau, American Community Survey (ACS), 2014 and DOH Lead Registry.
## Clark County Lead Screening & EBLL Notifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate # of children 0-6 yrs in Clark County</td>
<td>35,894</td>
</tr>
<tr>
<td># of children 0-6 yrs lead screened in Clark County (6/30/16)</td>
<td>530</td>
</tr>
<tr>
<td>Estimate # of children 0-6 yrs to be lead screened in 2016</td>
<td>1,060 (&lt; 3%)</td>
</tr>
<tr>
<td># of EBLL notifications reported to CCPH (9/15/16)</td>
<td>15</td>
</tr>
</tbody>
</table>
## Pb Screening in WA State for Children <6 years old

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated % of WA children screened</th>
<th>Estimated % of U.S. children screened</th>
<th>Proportion of WA tests ≥10 µg/dL</th>
<th>Proportion of U.S. tests ≥10 µg/dL</th>
<th>Proportion of WA tests ≥5 µg/dL</th>
<th>Proportion of U.S. tests ≥5 µg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1.3%</td>
<td>15.9%</td>
<td>0.48%</td>
<td>0.94%</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>2008</td>
<td>2.4%</td>
<td>17.1%</td>
<td>0.31%</td>
<td>0.72%</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>2009</td>
<td>3.0%</td>
<td>17.2%</td>
<td>0.28%</td>
<td>0.61%</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>2010</td>
<td>3.5%</td>
<td>16.7%</td>
<td>0.23%</td>
<td>0.60%</td>
<td>3.02%</td>
<td>6.64%</td>
</tr>
<tr>
<td>2011</td>
<td>3.1%</td>
<td>15.2%</td>
<td>0.15%</td>
<td>0.56%</td>
<td>2.40%</td>
<td>5.81%</td>
</tr>
<tr>
<td>2012</td>
<td>3.4%</td>
<td>10.5%</td>
<td>0.10%</td>
<td>0.62%</td>
<td>2.60%</td>
<td>5.42%</td>
</tr>
</tbody>
</table>

*Prior to 2010 tests ≤10.0 µg/dL were not considered elevated


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Future Actions by CCPH

1. Work with Health Care Providers – reporting and follow-up with patients
2. Increase County-wide awareness on Pb hazards
3. Expand outreach to identify resources County residents can use to address lead-based paint hazards.
4. Work with Ecology to ensure future support of EBLL Investigations
5. Collaborate with Community Partners (example – Community Services Housing Rehabilitation)
6. Seek out Grants

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Questions and Contacts?

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