

## Section 11.01 *Lead Poisoning*

### Overview

Lead poisoning remains a major environmental health concern in the United States (U.S.). Inhalation is the most common route of exposure in adults, while children are most commonly exposed to environmental lead through ingestion or inhalation, with ingestion of chips and dust from lead paint the most common source.<sup>1</sup> Exposure can also occur from contaminated soil from gasoline emissions, as lead was an additive in gasoline until the late 1970s, as well as historical incinerator operations.

According to the U.S. Department of Housing and Urban Development (HUD), about 34.6 million homes contain lead-based paint, including 18.2 million homes with significantly deteriorated lead-based paint, 21.9 million homes with dust lead hazards, and 2.4 million homes with soil lead hazards.<sup>2</sup> There is no known safe blood lead concentration. However, it is known that as lead exposure increases, the range and severity of symptoms and effects also increase. Lead exposure in young children and pregnant women can cause serious health effects and can affect almost every organ and system in the body.<sup>3</sup> During pregnancy, lead is released from bones and is used to help form the bones of the developing fetus. This risk increases if the pregnant mom is calcium deficient. Lead can also pass from a mother to her unborn child through the placenta.<sup>4</sup> The most important step caregivers, parents, doctors, and others can take is to prevent lead exposure before it occurs.

The current reference level at which the Centers for Disease Control and Prevention (CDC) has recommend public health actions be initiated is 3.5 µg/dL.<sup>5</sup> Lead poisoning is preventable, yet the negative health effects of lead poisoning can be life-long, so prevention of lead poisoning is crucial. Primary prevention and secondary prevention are tools used to prevent childhood lead exposure before any harm occurs. Primary prevention includes the removal of lead hazards from the environment before a child is exposed and is the most effective means of prevention. Secondary prevention including blood lead testing and follow-up remains an important safety net for children who may already be exposed to lead.

Lead can affect anyone, but children less than six years old are at increased risk from the deleterious effects of lead because their nervous system has not yet fully developed. Children absorb four to five times as much ingested lead as adults from a given source, with the gastrointestinal tract being the major route of absorption.<sup>6; 7</sup> Children's brains and nervous system are more sensitive to the damaging effects of lead. Young children are particularly vulnerable to lead hazards present in their surrounding environment because they can expose themselves to the harmful effects of lead through normal behaviors such as putting their hands and other objects in their mouths.<sup>8</sup>

### City Parks

In July of 2023, Mid Atlantic Associates conducted soil assessments for five City of Durham Parks. In August of 2023, a soil assessment report from Mid-Atlantic Associates showed that soil samples from five parks in Durham, Walltown, East End, East Durham, Lyon, and Northgate, had at least one soil sample that measured greater than the Environmental Protection Agency (EPA) threshold. One of the potential lead sources at these parks was lead-contaminated material from historical incinerator operations. Fencing and detailed signs were installed around the impacted areas and one playground was closed.<sup>9</sup>

In response to public concerns, City of Durham officials, in conjunction with Durham County Department of Public Health officials, conducted a town hall meeting on June 29<sup>th</sup>, 2023. The officials fielded questions and introduced a representative from Mid Atlantic Associates, Inc., an environmental consulting firm retained by the City to conduct an additional assessment of the parks to include confirmatory laboratory analytical testing.

On August 1<sup>st</sup>, 2023, Durham County Environmental Health staff, along with NC Department of Health and Human Services Occupational Health & Epidemiology staff conducted a field survey of Walltown, East End, and East Durham Parks. The survey was conducted in an effort to evaluate potential risk. In almost all open and accessible areas heavy vegetative cover in the form of thick grass was observed. Additionally, all children's play areas were covered with greater than 6 inches of mulch. Both meet or exceed the clearance standards pursuant to G.S. 130A-131.9C (15A NCAC 18A .3105) for bare soil lead concentrations greater than 400 parts per million. In light of these observations, staff felt the risk of poisoning was very low. However, it cannot be said that a risk does not exist.

North Carolina Department of Environmental Quality (DEQ) conducted a third field survey in January 2024. Results of the survey have not been released but DEQ is working closely with the City of Durham, NC DHHS Occupational Health & EPI, and Durham County Department of Public Health to address the issue in an effective and responsible manner.

### Food Contamination

Although uncommon, lead can also contaminate food during production, processing, packaging, preparation, or storage. In October 2023 three brands of applesauce thought to be responsible for the lead poisoning of at least 354 children in 41 U.S. states were recalled.<sup>10</sup> The source was thought to be cinnamon contaminated with extremely high concentrations of lead, which was added to the applesauce in a facility in Ecuador.<sup>11</sup>

The Food and Drug Administration public health alert was updated on November 3<sup>rd</sup>, 2023, to include various apple cinnamon fruit pouches and requested each state to voluntarily visit Dollar Tree stores to verify that all lots of WanaBana Cinnamon Apple Puree had been removed from shelves and was not being offered for sale. On November 13<sup>th</sup>, 2023, Durham County Environmental Health staff made visits to all ten Durham County Dollar Tree locations. Four three-pack boxes were identified at one location. The product was removed from the sales floor immediately. No other recalled product was identified at any of the other nine locations.

On December 8<sup>th</sup>, 2023, NC DHHS Division of Public Health's Environmental Health Section formally requested Local Environmental Health staff from across the state make visits to Dollar Tree stores known to have received recalled product. Six of the ten Durham Dollar Trees were officially cited as having received tainted product. Durham County Environmental Health staff visited the six locations on the same day but did not find additional products.

One confirmed lead poisoning case was potentially caused by the child consuming WanaBana recalled product. The confirmed poisoning was reported to Durham County Environmental Health prior to the recall and four investigation visits were made without success in identifying the source. It was later discovered that the poisoned child consumed several pouches of the product daily and thus became poisoned.

Two other children from a separate household had elevated blood lead levels, EBLs, after their mother learned about the recall and had the children tested. Both children consumed the recalled product on a regular basis. Durham County Environmental Health obtained several packages of the recalled product from the mother and provided it to DHHS State Laboratory for testing.

### Controlled Burn

In July of 2023, a controlled burn of a house conducted by the Durham City Fire Marshal’s Office deposited burn debris to surrounding properties in Durham. The vintage structure contained lead-based paint and extreme heat generated during the burn caused paint chips and other debris to drift and deposit across several streets and properties northeast of the burn site. Concerned residents requested evaluation and remediation as necessary. After careful assessment by the North Carolina Department of Health and Human Services Epidemiology/Occupational Health and Health Hazard Control Unit and Durham County Department of Public Health Environmental Health Division, the risk of lead hazard to these properties was determined to be very low.<sup>12</sup>

### Healthy People 2030 Objectives

The Healthy People 2030 Objectives included a goal to reduce blood lead levels in children one to five years from 3.31 µg/dL to 1.18 µg/dL.<sup>13</sup>

### Secondary Data

Secondary data shows an upward trend of parents getting their children tested for lead. The data also shows a downward trend of elevated blood lead level cases. Continued education and screenings may keep the trends going in the right direction.

#### Children Ages 1 and 2 Years Tested for Lead Poisoning in Durham County 2017-2019

Year	Target Population	Number Tested	Percent Tested	Lead $\geq 5$	Percent $\geq 5$
2019	8,333	4,558	54.7	23	0.5
2018	8,528	4,126	48.4	40	1.0
2017	8,577	4,192	48.9	37	0.9

Table 11.02(a) Ages 1 and 2 Years Tested for Lead Poisoning in Durham County<sup>14</sup>

### Interpretations: Disparities, Gaps, Emerging Issues

Lead poisoning poses risks to children and pregnant women who live or frequent homes that were built before 1978.<sup>15</sup> Pregnant women, refugees and children adopted outside of the U.S. are also at risk for higher lead exposure. Many adults and children don’t realize that lead may be present in their homes. Lead-based paint and lead dust inside and around homes are the most common and dangerous source of lead exposure.

Lead has been found in other sources including contaminated drinking water, spices, toys (including some toy jewelry), lead-glazed cookware, consumer products, folk medicine and in foods (sometimes used as a food additive or cosmetically for religious reasons).<sup>16-20</sup> Workers in certain industries such as battery manufacturing, auto mechanics, lead smelters, home improvement contractors, crafts and artistry, recyclers of metal and electronics and people who frequent gun ranges are at higher risk for lead exposure.<sup>21</sup>

- Elevated blood lead levels in children can contribute to:<sup>22-26</sup>
  - Learning problems (lower IQ, attention-deficit/hyperactivity disorder (ADHD))
  - Reduced attention span
  - Behavioral problems (e.g. Juvenile delinquency/criminal behavior)
  - Delayed growth
  - Hearing problems
  - Anemia
- In pregnant women, lead exposure can:<sup>27; 28,29-31</sup>
  - Increase risk for miscarriage
  - Cause a premature birth and low birth weight
  - Increased risk of preeclampsia

### Recommended Strategies

- Increase lead screening in children who are most at risk from lead poisoning. Testing for lead poisoning should target children between 12 -24 months who live in communities with a high percentage of houses built before 1960 and a high number of children with elevated blood lead levels. In addition, children, and adolescents under age 16 who enter the U.S. as an immigrant, refugee, or international adoptee should be tested at the time of arrival to the U.S.
- Educate residents who live in pre-1978 housing to use certified lead-based paint renovator and firm per North Carolina Rules 10A NCAC 41C .0900.
- Require proof of NC compliant lead-remediation training before issuing a permit for work that is likely to disturb paint in housing built before 1978.
- Collaborate with City of Durham Community Development Department and Durham Housing Authority to adopt HUD lead poisoning prevention policies to non-HUD rental properties. One study found that people who were living in HUD-assisted homes had lower levels of lead in their blood compared with those who were not.<sup>32</sup>
- Conduct lead dust testing in specified rental units, such as those with code violations and high tenant turnover. Partner with Neighborhood Improvement Services Housing Inspectors to implement lead dust testing for pre-1978 homes with code violations.
- Require use of NC certified firm & renovators on city/county pre-1978 housing contracts.

### Current Initiatives & Activities

#### ***Durham County Department of Public Health (DCoPH)***

The Health Education and Community Transformation Division offers free lead poisoning education and onsite testing for children six-months to six years old. The Women's Health Division provides blood lead testing to prenatal clients. The Nutrition Division provides nutritional counseling related to calcium and iron intake and referral to the WIC Program, as needed. The Environmental Health Division also offers and assists with conducting environmental investigations for children under the age of six and pregnant women that have two tests of an elevated level of 5 µg/dL within a 12-month period and provides nutritional counseling. <https://www.dcopublichealth.org/>

#### ***North Carolina Childhood Lead Poisoning Prevention Program (NC CLPPP)***

NC CLPPP currently coordinates clinical and environmental services aimed at eliminating childhood lead poisoning. The program provides technical assistance, training and oversight for

local environmental health specialists, public health nurses, laboratory technicians and private medical providers to assure healthy and safe conditions. <https://ehs.dph.ncdhhs.gov/hhccehb/cehu/>

***North Carolina Healthy Homes Outreach Task Force***

The North Carolina Healthy Homes Outreach Task Force is a group of local, state, and federal health and housing agencies working to implement healthy homes programming for vulnerable populations in the state. This group meets quarterly, engaging new partners from local health departments and state agencies and sharing information and ideas for incorporating outreach opportunities in targeted communities. <https://nchealthyhomes.com/task-force/>

***Partnership Effort for the Advancement of Children’s Health (PEACH)***

PEACH works to create healthy homes in Durham, North Carolina, and addresses community health and economics by creating a sustainable workforce to reduce environmental hazards in the community. <http://www.peachdurham.org/>

***City of Durham***

The City of Durham is required to test for lead and copper every 3 years. Durham maintains a sampling pool of more than 200 homes throughout Durham which were constructed between 1983 and 1985 for triennial tests. During a testing year, samples are collected from the volunteer pool and analyzed to ensure on-going compliance with established levels. The City of Durham city has also taken additional steps to add corrosion inhibitor to drinking water to minimize the leaching of lead into tap water. <https://www.durhamnc.gov/1156/Lead-in-Drinking-Water>

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