Testimony of Bruce Lanphear, MD, MPH
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"Protecting U.S. Children from Low-level Lead Toxicity"
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Prior to 1970, lead poisoning was defined by a blood lead concentration of 60 μg/dL or higher - a level often associated with overt signs or symptoms such as abdominal colic, encephalopathy or death (1). Since then, the blood lead concentration for defining lead toxicity has gradually been reduced from 60 μg/dL to 40 μg/dL in 1971, to 30 μg/dL in 1978, and to 25 μg/dL in 1985. In 1991, the Centers for Disease Control further reduced the definition of undue lead exposure to a blood lead concentration of > 10 μg/dL (1).

Children's blood lead concentrations have declined dramatically over the past 30 years. In the 1970s, 88% of US children younger than 6 years were estimated to have a blood lead concentration > 10 μg/dL (2). When lead was at long last banned from paint, lead solder in canned foods and phased out of gasoline, children's blood lead levels plummeted (2). By the early 1990s, fewer than 5% of children younger than 6 years were estimated to have blood lead concentrations > 10 μg/dL (3).

Despite the dramatic decline in children's blood lead concentrations, lead toxicity remains a major public health problem. Exceedingly low-levels of exposure to environmental lead have been associated with an increased risk for reading problems, ADHD, school failure, delinquency and criminal behavior in children and adolescents (4-9). Moreover, there is no evidence of a threshold for the adverse consequences of lead exposure (10-13). Indeed, studies show that the decrements in intellectual function are, for a given increase in blood lead concentration, greater at blood lead levels < 10 μg/dL (10-13), the level considered acceptable by the Centers for Disease Control. On average, there is an estimated decline of 2 to 3 IQ points for children whose blood lead levels rise from 10 to 20 μg/dL, but there is an estimated

decline of 4 to 7 IQ points for children whose blood lead levels rise from 1 μg/dL to 10 μg/dL (10-11).

Lead's effects extend beyond childhood. In adults, lead exposure has been associated with some of the most prevalent diseases of industrialized society: cardiovascular disease (14-15), miscarriage (16), renal disease (17-18) and cognitive decline (19). Consistent with research on childhood lead exposure, there is emerging evidence indicating that the risk for death from heart attacks and stroke, as well as the risk for chronic kidney disease, occur at blood lead levels considerably lower than 10 μg/dL.

The key to primary prevention is to eliminate environmental lead exposure. Federal agencies use a variety of standards for unacceptable lead content. It is critical to recognize that all of these standards were promulgated long before research demonstrated the harmful effects of lead at blood lead levels below 10 μg/dL. Because there is no known safe level of lead exposure, exposure to lead below these existing standards should not be considered "safe."

Prevention of lead toxicity will, first and foremost, require a declaration of the full scope of the problem. Thus, the CDC's level of concern should be lowered to a blood lead level < 5 μg/dL because society cannot respond to a threat until it first acknowledges it. It will require the revision of regulations to further reduce airborne lead exposure; screening of high-risk, older housing units to identify lead hazards before a child is exposed - before occupancy, after renovation or abatement; reductions in allowable levels of lead in water; and stricter regulations and enforcement on the allowable levels of lead in toys, jewelry and other consumer products. Finally, protecting children will require eliminating all non-essential uses of lead.

Recommendations:

1. The US EPA should request the National Academies of Science to update the Report on Protecting Infants, Children and Pregnant Women. This Report should review and synthesize the existing evidence about sources of lead intake; evaluate the adverse effects of lead at blood lead levels <10 μg/dL; review and synthesize existing evidence about primary prevention of lead exposure and; make recommendations about the primary prevention of lead exposure.

2. The US EPA should heed the advice of the Clean Air Scientific Advisory Committee and lower the National Ambient Air Quality Standard NAAQS) for Lead to a level no greater than 0.2 $\mu g/m^3$.

3. As recommended by the Clean Air Scientific Advisory Committee, the US EPA should review the existing residential dust standards to ensure that they are sufficiently low to protect children.

4. The US EPA should review the water lead standard to ensure that it is sufficiently low to protect children.

5. As recommended by the American Academy of Pediatrics, the federal government should require all products intended for use by or in connection with children to contain no more than trace amounts of lead.

6. As recommended by the American Academy of Pediatrics, the US EPA should define a “trace” amount of lead in consumer products as no more than 40 ppm, the upper range of lead in uncontaminated soil.

7. As recommend by the American Academy of Pediatrics, “children’s product” should be defined to ensure it will cover the wide range of products used by or for children under the age of 12 years.

8. As recommended by the American Academy of Pediatrics, the limit on lead content must apply to all components of the item or jewelry or other small parts that could be swallowed, not just the surface covering.

9. As recommended by the American Academy of Pediatrics, legislation or regulations should limit the overall lead content of an item, rather than only limiting lead content of its components.

Respectfully submitted,

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