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ENERGY AND COMMERCE SUBCOMMITTEE ON COMMERCE, TRADE, AND CONSUMER PROTECTION

"Protecting Children from Lead-Tainted Imports"

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Department of Federal Affairs
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Good morning. Thank you for the opportunity to testify today before the Energy and Commerce Subcommittee on Commerce, Trade and Consumer Protection at this hearing, "Protecting Children from Lead-Tainted Imports." My name is Dana Best, MD, MPH, FAAP, and I am proud to represent the American Academy of Pediatrics (AAP), a non-profit professional organization of 60,000 primary care pediatricians, pediatric medical sub-specialists, and pediatric surgical specialists dedicated to the health, safety, and well-being of infants, children, adolescents, and young adults. I am an Assistant Professor of Pediatrics at George Washington University School of Medicine and an attending physician at Children's National Medical Center in Washington, D.C. I also serve on the AAP's Committee on Environmental Health, which is the primary body within the AAP that handles lead issues.

Lead is Ubiquitous in Our Environment.

Lead is a soft, heavy and malleable metal that occurs naturally in trace amounts throughout the environment. Due to its abundance and easy workability, it has been used for thousands of years in plumbing, production of glass and crystal, and manufacture of ammunition.[1] Its toxicity was recognized by the Romans[2] and documented during the twentieth century, as its increasingly widespread use led to unprecedented levels of occupational and environmental lead poisoning.[3] By 1970, science had demonstrated conclusively that lead could cause both acute poisoning as well as a wide range of long-term human health consequences.[3, 4] Since then, hundreds of studies have shown that the body has no use for lead, and that a "normal" blood lead level is zero.

Because of its widespread use, lead has been concentrated in the environment where it poses a serious threat to children's health. Furthermore, because it cannot be identified easily, even when present in high amounts in paint, dust, or dirt, children can be exposed in their homes and schools and at play without our knowledge. It is an "invisible" poison.

Low Levels of Lead Can Cause Serious Effects

Damage done by small amounts of lead may be hard to measure and even harder to understand. Most children who accumulate lead in their body do not have any physical symptoms, but low lead levels cause a wide array of negative effects, including cognitive, motor, behavioral, and physical harm.[5]

There is no "safe" level of lead exposure. The developing embryo, fetus, and child grow and change rapidly. If, during this period of change, the fetus or child is exposed to a poison of some kind, development can be impacted negatively. These "critical windows of exposure" are specific periods of development during which the embryo or fetus is undergoing some process (such as the development of arms and legs between days 22 and 36 of pregnancy, when thalidomide damages their development.[6, 7]) There are many other examples of this effect, including tobacco smoke and behavioral effects, and alcohol and fetal alcohol syndrome. The critical period associated with harm from lead poisoning is brain and nervous system development, which begins in early pregnancy and continues until at least age 3 years.[8]

The vulnerability of children to lead poisoning during development of their brain and nervous system has been amply demonstrated, and the literature is very consistent. On average,

children whose blood lead levels (BLLs) rise from 10 to 20 mcg/dL lose two to three IQ points. More recent studies have shown an even greater impact on IQ of BLLs under 10 mcg/dL. Key studies reported a loss of 4 to 7 IQ points in children whose lead levels rose from 1 mcg/dL to 10 mcg/dL.[9, 10] These studies suggest that "low" levels of exposure – meaning BLLs less than 10 mcg/dL – cause proportionately greater harm than higher levels. The effects of lead on health do not stop once the child's brain and nervous system mature or the BLL falls. A recent study found that in a group of 7-year old children exposed to lead before the age of 3 years, IQ continued to fall, even after the BLL had declined.[11]

Another important lasting effect of lead exposure is on behavior, with higher rates of behavioral problems reported in teens and adults exposed to lead during childhood. Children with elevated lead are more likely to have problems with attention deficit, reading disabilities, and to fail to graduate from high school.[12] Investigators have identified associations between lead exposure and increased aggression, commission of crime and antisocial or delinquent behaviors.[13-16] Studies have suggested that several nations which began reducing lead exposure aggressively in the 1970s experienced corresponding decreases in crime rates two to three decades later.[16] Other effects include abnormal balance, poor eye-hand coordination, longer reaction times, and sleep disturbances.[12, 17, 18]

The loss of a few IQ points or a small increase in the proportion of children with behavioral problems in the population of U.S. children has marked impacts on educational needs and future potential.[19] Since lead exposure is a population-wide risk, even relatively low levels of exposure

can affect large numbers of children. This means that more children need special education, there are fewer gifted children, and over time, the average IQ of the entire population falls.[19]

Lead Poses a Serious Health Hazard to Children At Every Level of Exposure and Every Stage of Development

Lead is easily absorbed by ingestion or inhalation. The most common route of exposure of children is through ingestion, usually by putting hands and other objects in their mouth. Both hand-to-mouth exploration and playing on floors are typical behaviors for children, especially younger children. Studies using videos to record oral behaviors of young children report hand or object in mouth activities 20 or more times per hour.[20, 21] If the dirt on their hands or the dust on the floor contains lead, every one of those activities delivers a dose of lead.

Another significant difference between children and adults is in the rate of their metabolisms. Children have significantly faster metabolisms, which means that they breathe faster and ingest proportionately more food and water.[22] This difference means that in similar environments, children are exposed to a greater extent to contaminants than adults. Since children absorb 5 to 50% of any lead they ingest (compared to adults, who absorb 10-15%),[23] they are at high risk of lead poisoning every time they are exposed.

Once lead enters the body it remains there for years. Lead is similar to calcium from the elemental perspective. This means that our bodies "see" lead as calcium, absorb it into blood and then store it in bone. These stores of lead can be released years later, when bone changes occur or demands on calcium stores are made.[24] Another consequence of storing lead in bone is

that exposures separated by months or years have an additive effect on the body's burden of lead and can exert effects over decades. Acquisition of lead in the body even in small amounts (i.e., amounts that result in BLLs less than 10 mcg/dL) contribute to this accumulation of lead. This means that commonly encountered blood lead concentrations have lasting negative effects.

Another consequence of this accumulation of lead in bone is the exposure of the fetus to lead by the mothers. Women exposed to lead during childhood may have significant stores of lead in their bones. If they do not consume adequate calcium during pregnancy, their bones release calcium as the fetus grows. As the calcium is released, lead is released as well. This lead can be transferred to the fetus – exposing the fetus' developing brain and nervous system at a critical time. Fetal exposure from this route has been demonstrated to cause measurable decreases in IQ.[25]

Sources of Children's Exposure to Lead

The most common source of lead exposure today is lead paint, found in older housing stock. As paint wears off, it contaminates the dust that clings to surfaces, toys and the fingers of children. Other sources of lead exposure include contaminated soil, traditional or folk medicines, and certain types of dishes. In recent years, however, parents have found a new source of anxiety regarding lead exposure: children's toys and other products, particularly those imported from China.

These concerns are justified. Since July 2006, the CPSC has issued at least 11 recalls affecting more than 6.7 million units of children's toy jewelry due to excessive lead content.

Since 1998, CPSC has issued at least 29 recalls involving 157,962,000 pieces of toy jewelry due to high lead levels. Other products recalled during that time due to lead contamination include game pieces, candles, sidewalk chalk, and art kits. Consumers are acutely aware of recent recalls of popular toys found to contain lead paint, including Thomas the Tank Engine, Mattel's Barbie, and Fisher-Price's Dora the Explorer toys. The risk of harm to children from these toys is real: in 2006, a 4-year-old Minnesota boy died after ingesting a small Reebok shoe charm that was later found to be 99.1% lead.[26] The charm he ingested dissolved in his stomach, releasing the lead into his bloodstream.

Lead Must Be Removed from Toys and Other Children's Products

The American Academy of Pediatrics has consistently urged the Consumer Product Safety Commission (CPSC), the Environmental Protection Agency (EPA), and other agencies to take aggressive, proactive steps to minimize children's exposure to lead. The addition of lead to jewelry or toys is not in any way central or even necessary to the function or purpose of the product. For example, manufacturers add lead to jewelry to give it more weight or heft, rather than using a more expensive but safer metal. None of these factors represent a compelling rationale for including a poisonous substance in a product specifically designed for use by children.

The range of products covered by a ban on lead content must also be considered carefully. "Children's product" must be defined broadly enough to cover the full range of items capable of causing a serious hazards – not just toys or "toy" jewelry but also durable products such as furniture (cribs, strollers, high chairs, etc.) and products meant for the care of children (bath

seats, gates, etc.). One of the first pediatric deaths attributed to lead paint was a child who chewed on the railing of his crib – in 1913.[4]

Finally, legislation should cover products meant or designed for use by or with children at least up through the age of 12. Children are susceptible to neurological damage from lead exposure throughout the development of their brain and nervous system. Their long "shelf life," or the period of time over which they can be exposed to and accumulate lead in their bodies, means that every exposure should be eliminated or minimized to prevent future harms. Finally, toys meant for older children often find their way into the hands of younger siblings and other small children, posing a hazard to these children outside the object's target audience.

Federal Lead Standards

Federal agencies use a variety of standards for unacceptable lead content. This issue is complicated by the fact that lead uptake varies depending upon the route of exposure (ingestion, inhalation, skin contact, etc.) In considering existing guidelines, it is critical to bear in mind that many were set before research demonstrated the harmful effects of lead at low levels. There is no known safe level of lead exposure; as a result, exposure to lead below these levels should not be considered "safe."

- In 1978, the Consumer Product Safety Commission banned the manufacture of paint containing more than 0.06% lead by weight on interior and exterior residential surfaces, toys, and furniture.
- Based on that standard for lead paint, the CPSC's current voluntary standard prohibits toy jewelry to contain more than 0.06% lead by weight. The standard further requires

manufacturers to test for the "accessibility" of lead, although surface accessibility may be irrelevant if an item is small enough to be ingested.

- The EPA requires water provided by public utilities to contain no more than 15 parts per billion of lead. The 1986 Safe Drinking Water Act Amendments banned the use of lead in public drinking water distribution systems and limited the lead content of brass used for plumbing to 8%.
- The EPA set guidelines for lead contamination of dust, limiting levels called "safe" to below 40 mcg/ft^2 for floors.[27] It is important to note that this is not a health-based standard; an estimated 20% of children exposed to floor dust lead levels at 40 mcg/ft^2 will have a blood lead level above 10 mcg/dL.[28]
- In response to reports of lead contamination in candies likely to be consumed frequently by small children, the Food and Drug Administration (FDA) set a maximum lead level of 0.1 parts per million (ppm). FDA has set different levels for other products; for example, dairy product solids may contain lead at no more than 0.5 ppm.[29]
- The FDA recommends a limit on children's lead intake in food to no more than 6 mcg/day. It is important to note that this is not a health-based standard; this limit is roughly equivalent to the amount of lead that would be expected to lower IQ by 1 point.
- FDA regulates lead content in cosmetics; for example, the colorant manganese violet may contain lead at no more than 20 ppm.[30]
- Airborne lead is regulated by EPA as a "criteria pollutant" under the Clean Air Act. The National Ambient Air Quality Standard for lead is 1.5 mcg/m^3, maximum arithmetic mean averaged over a calendar quarter.

- Both the National Institute for Occupational Safety and Health and the Occupational Safety and Health Administration set permissible limits for lead exposure in the workplace, but these guidelines are designed for adults and not appropriate for children.

Recommendations

To protect the health of our nation's children, nonessential uses of lead, particularly in products to which children may be exposed, must be prohibited. The American Academy of Pediatrics recommends the following:

- The CPSC should require all products intended for use by or in connection with children to contain no more than trace amounts of lead.
- The Academy recommends defining a "trace" amount of lead as no more than 40 ppm, which is the upper range of lead in uncontaminated soil.[31] This standard would recognize that contamination with minute amounts of lead in the environment may occur but can be minimized through good manufacturing practices.
- "Children's product" should be defined in such a way as to ensure it will cover the wide range of products used by or for children. This standard should cover toys intended for use by or with children under the age of 12 years.
- The limit on lead content must apply to <u>all</u> components of the item or jewelry or other small parts that could be swallowed, not just the surface covering.
- Legislation or regulations should limit the overall lead content of an item, rather than only limiting lead content of its components. A single product may contain numerous component that could cumulatively contain a dangerous level of lead.

Finally, it is important to note that, while limiting lead is an important aspect of guaranteeing the safety of children's products, numerous other aspects of this issue should also be considered. Other key children's product safety issues including choking hazards, flammability, dangerous magnets, and safe product design.

Conclusion.

There is no known "safe" level of lead for children.[32, 33] No study has determined a blood lead level that does not impair child cognition. Since any measurable lead level causes lasting harm, prevention of exposure is the only treatment.[34] Lead exposure is an important, unnecessary, and preventable poisoning.

The American Academy of Pediatrics commends you, Mr. Chairman, for convening this hearing to examine the pernicious threat to children's health posed by lead. I appreciate this opportunity to testify, and I look forward to answering any questions you may have.

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