



CDC Recommendations for Lead Poisoning Prevention in Newly Arrived Refugee Children

Lead poisoning remains one of the most common and preventable pediatric environmental conditions even though the United States (US) has made great strides in reducing the number of children with elevated blood lead levels. One objective of Healthy People 2010 is to eliminate blood lead levels (BLLs) $>10 \mu\text{g}/\text{dL}$ among the nation's children. US children living in poorly maintained housing built before 1978 are at greatest risk for elevated BLLs because of their frequent exposure to lead-based paint and lead-contaminated house dust and soil.

The prevalence of elevated blood lead levels (i.e., BLLs $>10 \mu\text{g}/\text{dL}$) among newly resettled refugee children is substantially higher than the 2.2% prevalence for US children. For this reason, the US Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), Childhood Lead Poisoning Prevention Branch and Division of Global Migration and Quarantine, in collaboration with the Office of Global Health Affairs and Office of Refugee Resettlement, and the US Department of State, Bureau of Population, Refugees and Migration, developed the following recommendations specifically to address lead exposure among refugee children.

Background:

New Hampshire requires blood lead screening of newly arrived refugee children aged 6 months to 16 years. Beginning in May 2004, 242 refugee children, predominately from Africa, were resettled to New Hampshire. Of these, 96 children were tested

twice for BLLs. The first blood lead samples were collected within 90 days of the children's arrival, and the second samples were collected 3 to 6 months after their resettlement. Most of the children had initial capillary BLLs $<10 \mu\text{g}/\text{dL}$. Venous follow-up tests found that 38 (40%) children had BLLs $>10 \mu\text{g}/\text{dL}$; as did 5 other children who were siblings of cases (range: 11 to 73 $\mu\text{g}/\text{dL}$). Eleven of the recently resettled families had at least one child with a BLL $>20 \mu\text{g}/\text{dL}$. Environmental investigations revealed moderate lead hazards within the residences of the children as well as lead-contaminated soil in play areas frequented by the children. The children with elevated BLLs also showed evidence of extreme chronic malnutrition. Health examinations before arriving in the US indicated that 16 (37.2%) of the children had severe growth retardation (Height per Age Z-score <2 ; or approximately the second percentile on the standard pediatric growth curve) and, of the 40 children for whom weight was measured, 10 (25%) had evidence of failure to gain weight or of loss of weight (Weight per Height Z-score <2 ; or approximately the second percentile on the standard pediatric growth curve).

Recommendations:

Primary Prevention of Elevated Blood Lead Levels

Ideally all children would live in lead-safe housing, especially those whose nutritional status and lack of knowledge about the dangers of lead place them at great risk for lead poisoning. However, we recommend the following to reduce the risk of lead exposure in refugee children:

Identification of Children with Elevated Blood Lead Levels

1. BLL testing of all refugee children 6 months to 16 years old at entry to the US
 - Federal standards stipulate that a refugee medical screening take place within 90 days after a refugee's arrival in the US. The content of the screenings vary from state to state. Childhood lead poisoning prevention programs report that most states do not have a BLL screening protocol for refugee children and that lead program surveillance data cannot identify which children are refugees.
 - Studies indicate that age is not a significant risk factor for elevated BLLs among refugee children. Although the risk for lead exposure among children older than 6 years may be the result of exposure in their country of origin, many of the prevailing health, social, and economic burdens accompany the children to the US thus suggesting the value of screening ALL refugee children at time of arrival.
2. Repeat BLL testing of all refugee children 6 months to 6 years 3 to 6 months after refugee children are placed in permanent residences and older children, if warranted, regardless of initial test results.
 - Children who mouth or eat non-food items, especially soil, which is common among certain refugee populations, are at risk for lead poisoning, regardless of the age of their housing.
 - The New Hampshire case study demonstrates that although some children had elevated BLLs when they arrived in the US, the majority of the children did not. The follow-up screening which was conducted on average 60 to 90 days after the placement of the children in the state and in their permanent residences, revealed elevated BLLs that ranged from 11 to 72 µg/dL.
 - The refugee status for most of the children entitles them to Medicaid, WIC, and other social services for at least 8 months after their resettlement, regardless of family financial status.

Early Post-arrival Evaluation and Therapy

1. Upon US arrival, all refugee children should have nutritional evaluations performed, and should be provided with appropriate nutritional and vitamin supplements as indicated.
 - Pre-existing health burdens such as chronic malnutrition, along with cultural, language, and economic barriers compound refugee children's risk for lead poisoning. For example, iron deficiency, prevalent among refugee children, increases lead absorption through the gastrointestinal (GI) tract.
 - At a minimum, the nutritional evaluation should include an evaluation of the children's iron status including a hemoglobin/hematocrit and one or more of the following an evaluation of the mean corpuscular volume (MCV) combined with red cell distribution width (RDW); ferritin; transferrin saturation; or reticulocyte hemoglobin content.
2. Evaluate the value of iron supplementation among refugee children.
 - Study of iron supplementation in refugee children will provide needed data on its efficacy to reduce nutritional deficiencies and, thus, reduce lead absorption through the GI tract.

Health Education/Outreach

1. CDC and its state and local partners should develop health education and outreach activities that are culturally appropriate and sensitive to the target population.
2. CDC and its state and local partners should develop training and education modules for health care providers, refugee and resettlement case workers, and partner agencies (e.g., WIC) on the following:
 - Effects of lead poisoning among children.
 - Lead sources in children's environments and ways to reduce the risk of exposure.
 - Nutritional and developmental interventions that can mitigate the effects of lead exposure.
 - Ways to provide comprehensive services to children with elevated BLLs.