

LEAD POISONING HAS NOT GONE AWAY

A CASE:* The parents of a one-year-old boy were in the process of remodeling the upstairs and exterior of the 1907 home they had purchased in the last year. The family was living in the finished basement apartment during the remodeling. The parents learned that the renovation work could be a lead hazard for their son, and they had his blood lead tested. The results of the test showed that the child had a blood lead level of 20 µg/dl (normal levels are <10 µg/dl). Follow-up test results 3 and 6 months later were 16 µg/dl and 12 µg/dl, respectively. One year after the initial test his level was down to 10 µg/dl.

On-site investigation by the county health department focused on areas that the child would have access to — the basement living area and the exterior of the house. All dust samples from floors in the basement apartment were up to 50 times above the current U.S. EPA action level of 100 µg/ft², and the soil samples also exceeded the EPA action level of 400 parts per million. The likely source of exposure for this child was the lead dust that was being tracked into the apartment because of the remodeling work in the upstairs and the exterior.

Because of concern about lead exposure, the workman sanding, scraping and repainting the house also had a blood lead test done. His blood lead level was 75 µg/dl, and he was asymptomatic. A second lead test yielded a level of 61 µg/dl. The patient declined further follow-up because the job was finished. He had not worn any respiratory protection while working.

INTRODUCTION

As the above case illustrates, lead exposure is still a problem in Oregon, in large part because of the persistence of lead-containing paint in older homes. This article describes the evidence that many Oregonians, especially children, continue to be at risk of exposure to elevated lead

levels in their home environment, and stresses the importance of prevention.

HEALTH EFFECTS AND TREATMENT

Although at high levels (>70 µg/dl) lead can cause kidney failure, coma and death, those levels are extremely rare these days. While adults exposed most intensely to lead, most often at work, can have high levels, almost all children with lead poisoning today have much lower levels, and at these levels lead poisoning does not manifest life-threatening symptoms. Because of this, a blood lead test is the only way to know if a child living in an high-risk home actually has an elevated lead level. Blood levels in children even below the 10 µg/dl cutoff have been documented to have small effects on future cognitive function, and there does not appear to be a threshold below which no effects are present. The duration and timing of exposure also appear to modify the effects of the poisoning — longer exposure is thought to be more damaging, and elevated lead levels at two years of age are thought to best predict the effects on IQ.

The pharmaceutical treatment for lead poisoning is chelation therapy. While chelation is thought to prevent further damage from occurring, it cannot undo damage that has already occurred. Moreover, almost all children with lead poisoning in Oregon these days have levels well below the threshold for which chelation therapy is indicated and approved (45 µg/dl). These facts underscore the importance of activities to prevent lead poisoning from occurring in the first place, including identification and control of the hazard, and efforts to encourage appropriate iron and calcium intake.

SOURCES OF EXPOSURE

Prior to 1978 lead was a common additive to housepaint. Because of our wet climate in the Northwest, the durability and anti-mildew properties of lead-containing house paint made it a desirable

product for use on both indoor and exterior surfaces. Because of concerns about health risks, lead was finally eliminated from residential paint in 1978. Homes painted prior to the elimination of lead from house paint pose an ongoing risk as painted surfaces deteriorate over time and when paint is disturbed in remodeling by sanding, scraping or power-washing. Friction from opening and closing doors and double hung windows is a major contributor to indoor lead dust levels. Some lead dust inside homes may also come from lead-containing soil and dirt that has been blown in through windows and doors, or tracked in from outside on shoes or on pets. The lead in soil remains stable for many years, and can come from lead paint used on the exterior of homes, from lead in leaded gasoline, and from air pollution.

The risk of exposure to hazardous levels of lead dust is not a problem that only affects low-income Oregonians. Older homes are common in many middle- and upper-income neighborhoods. Indeed, the likelihood of exposure to elevated levels of lead paint dust is greater when older homes are renovated and painted surfaces are disturbed by sanding and scraping, which one would expect to be more common among Oregonians with higher incomes. The risk of exposure is also high in homes where the paint is deteriorated or peeling. Older homes that are likely to contain substantial amounts of lead can be found in communities in every county of the state.

A recent study conducted by the Multnomah County Health Department confirmed the presence of lead in most older homes. The researchers sought to determine the proportion of older homes that had hazardous levels of lead dust present in the indoor environment. A total of 127 owner-occupied homes built before 1930 were tested to determine the amount of lead present in dust samples. Dust samples were collected from non-carpeted floors, in window wells, and on window sills. Sam-

* This case is a composite of two actual Oregon lead poisoning cases.

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ples were analyzed using approved laboratory methods, by a certified laboratory. Almost three-quarters (71%) of the houses tested were found to have composite lead dust levels that exceeded federal standards. These houses contain amounts of lead dust that could be hazardous to children and adults.

Other sources of lead exposure include lead in the glaze of some earthenware pottery used for cooking or serving food, lead in home remedies, home hobbies that use lead (such as stained glass and casting lead fishing weights or bullets), lead dust brought home from the workplace, and target shooting. However, these are less frequent sources of lead poisoning for both adults and children in Oregon.

Because of lead's effects on the developing brain, children between the ages of 6 months and 6 years old are most likely to be affected by lead poisoning. In addition, these children are also most likely to get lead into their bodies because they have more tactile contact with their environment and are more likely to put dusty hands and other objects in their mouths. Young children also absorb lead more readily than adults.

THE PREVALENCE OF LEAD POISONING IN OREGON

From 1997 through 1999 there were 270 children under 6 years of age in Oregon who had confirmed elevated blood lead levels above 10 µg/dl. In about 75% of these cases, the cause was determined to be exposure to lead dust in and around older homes. During the same time there were six confirmed reports of adults with lead poisoning due to home-remodeling work.

Lead poisoning is almost certainly under-reported in Oregon, as a blood test is the only way to know if someone has been poisoned, and blood lead testing is far from routinely conducted on at-risk children or adults. In the last year, only approximately 6% of one-year-old children in Oregon received a screening blood lead test. Because of the small number of children tested statewide, three groups have worked to estimate the prevalence of lead poisoning among children in North/Northeast Portland, the largest community in the state likely to be at high risk by virtue of having a large old housing stock and a substantial low-income population. The data from these three sources agree, and indicate that the prevalence of elevated blood lead levels (≥ 10 µg/dl) among Oregon children under age 6 is between approximately 1% and 3%.

PREVENTION

Since pharmaceutical treatment for lead poisoning cannot adequately address the problem, prevention should be the focus of Oregon's response. Given that lead-containing paint dust is the primary source of exposure for most children, and that lead appears to be ubiquitous in many older homes in Oregon, education of parents about the need to control exposure to that dust is important. While community-based prevention activities can help with this education, health care providers have a role to play as well. Parents should be advised to clean any dust-containing areas, particularly window sills and window wells, with a wet rag or mop at least twice a week, and to ensure that paint chips are not accessible to children. Parents should also be ad-

vised that any renovation (repainting or remodeling) on older homes needs to be done by workers who have been trained and certified in lead-safe remodeling. Do-it-yourself remodelers need to follow appropriate lead-safe procedures. In addition, frequent washing of toddlers' hands and of any objects they are likely to put in their mouths can help prevent exposure from any lead that might be picked up from the environment. Since iron and calcium deficiency enhance the absorption of lead from the gastrointestinal tract, provision of adequate nutrition is also important. While a negative blood lead test does not eliminate the need for these measures, a positive test may help reinforce for parents the need to take this problem seriously.

While Oregon does not appear to have the level of lead poisoning hazard present in many East Coast cities, older homes are still common throughout our state and the lead paint in them continues to pose the greatest single hazard, especially to young children. Prevention efforts, including those that can be provided by the medical community, can play an important role in reducing this preventable health problem.

For further information on lead poisoning, contact the Oregon Health Division, 503/731-4025.

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