



## **BOSTON COLLEGE**

Program for Global Public Health and the Common Good

### **Preventing Lead Exposure in Telecommunications Workers**

#### **What is lead?**

Lead is an ancient metal, an element that has been mined and used by humans since prehistoric times. It is highly toxic to people of all ages. Even the lowest levels of lead can harm health and cause disease. The World Health Organization and the Centers for Disease Control and Prevention (the CDC) have determined that no level of lead in blood is safe.

#### **How are Telecommunications Workers Exposed to Lead?**

Lead was used extensively from the late 1800s to the 1960s to insulate communications cables and to protect cables from wind, weather and water. These lead-sheathed cables were suspended on overhead utility poles, run underground, and run under lakes, rivers and the ocean. Thousands of miles of lead-sheathed communications cables still stretch across the United States today.

Over time, the lead sheathing on communications cables degrades. Small particles of lead fall to the ground underneath aerial cables and contaminate the soil. They enter water bodies from submarine cables. They also accumulate in dust and sediment in manholes and communications conduits containing lead-sheathed cables.

Telecommunications workers are at risk of exposure to lead from lead-sheathed cables whenever they work on or around these cables. When workers use heat sources to melt lead during cable splicing, they generate an airborne lead fume which can be inhaled, causing high risk of lead poisoning, especially if the work is performed in a confined space such as a manhole. Workers can also be exposed to lead dust, which can get into the body either by inhalation or by swallowing. To avoid risk of food contamination, workers should never eat or drink in the vicinity of lead-sheathed cables.

#### **What are Lead's Impacts on Telecommunications Workers' Health?**

Acute high-dose lead exposure from inhalation of lead fume can lead to coma, convulsions and even death. Fortunately, such acute lead poisoning is extremely rare in the United States today.

Chronic lead exposure is more common and is associated with damage to multiple organs, notably the brain, heart and kidneys. It increases risk of dementia, high blood pressure, heart disease and kidney disease. All of these effects are most common and most severe in the most heavily exposed workers, but risk is increased with any elevation of the blood lead level, even at blood lead levels below the OSHA action level of 30 micrograms/dl.

**How are Lead Exposure and lead Poisoning Diagnosed?**

Measurement of the blood lead level is the most common way of diagnosing lead exposure and lead poisoning. However, the blood lead level tells us only about relatively recent lead exposure – in the past 60 or 90 days.

To measure a worker's total cumulative lead exposure over the years in the case of chronic exposure, it is necessary to do a bone lead measure using X-ray fluorescence (XRF). In XRF testing, a very low dose of X-ray is used to measure lead accumulation in the bones.

**What Legal Standards Protect Telecommunications Workers against Lead?**

The standard for lead in air set by the US Occupational Safety & Health Administration (OSHA) is 50 micrograms/cubic meter ( $m^3$ ) averaged over an 8-hour period. The OSHA action level for lead in blood is 30 micrograms/dl.

It is important to know that both of these standards are badly outdated. They were set more than 40 years ago when we knew much less about lead toxicity than we know today. We now know that any elevation of the blood lead level above the US baseline level of 2 micrograms/dl increases risk of disease, and the higher the blood lead level, the greater the risk. In other words, these OSHA standards do not adequately protect workers' health.

The OSHA lead standard requires employers to provide changing and showering facilities for workers exposed to lead. This legal requirement is intended to prevent workers from carrying lead home on the skin, hair, clothing, shoes and vehicles.

**What is 'Take-Home' Lead Poisoning?**

Take-home lead poisoning is the exposure of family members, and especially children and grandchildren to lead that a worker inadvertently carries home from the workplace on skin, hair, clothing, shoes and vehicles. The requirement for changing and showering facilities is intended to prevent take-home lead poisoning.

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