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Breaking the Lead Floor Protecting Workers and Their Families

To the Editor:

Adverse health effects of high-level lead exposure have been known since antiquity. In recent decades, however, a solid body of evidence about the cardiovascular, renal, reproductive, developmental and neurologic health effects in adults that occur at progressively lower levels has emerged.^{1,2} In addition, both the International Agency for Research on Cancer³ and the U.S. National Toxicology Program (NTP)⁴ have classified lead as a probable human carcinogen. Despite this, occupational exposure standards in the U.S., which were developed based on the science available 50 or 60 years ago, have not kept pace with new knowledge. The U.S. Occupational Safety and Health Administration (OSHA) standards for lead permit ongoing lead exposure for workers with blood lead levels (BLL) up to 50 or 60 $\mu\text{g}/\text{dL}$ (depending on the calculation method) when airborne exposures are at or above the action level.⁵ The standards in the 22 State-Plans (OSHA-approved workplace safety and health programs operated by individual states or U.S. territories) typically adopt the Federal OSHA standards verbatim, and if different, rarely with any substantive modification.

Although OSHA acknowledges that "lead can cause health effects at blood lead levels lower than those established by OSHA's 1978 Lead standard,"⁶ over time, these standards have come to reflect an outdated science and are an historical relic that fail to do what they were designed to do. Change, however, comes slowly; revision or promulgation of OSHA standards has been shown to be an inordinately long and fraught process.⁷

The 2012 NTP Monograph on Health Effects of Low-Level Lead² concluded that for adults with BLL $<5 \mu\text{g}/\text{dL}$ there was

sufficient evidence for decreased glomerular filtration rate and that maternal blood lead was associated with reduced fetal growth; there was limited evidence for increased incidence of essential tremor. For adults with BLL $<10 \mu\text{g}/\text{dL}$ there was sufficient evidence for increased blood pressure, increased risk of hypertension, and increased incidence of essential tremor; there was limited evidence for psychological effects, decreased cognitive function, decreased hearing, increased incidence of ALS, increased cardiovascular-related mortality, and maternal blood lead associated with increased incidence of spontaneous abortion and preterm birth.

The Flint, Michigan public health debacle that began in 2014 received national and international attention, promoting debate about social justice, policy issues, and corrective actions.^{8,9} The Michigan Occupational and Environmental Medicine Association (MOEMA) was able to leverage the attention given to the Flint crisis by collaborating with Michigan OSHA to amend our occupational lead standards. This effort dove-tailed with a State response to the Flint water crisis; specifically, a recommendation contained in a 2016 report by a board charged by the governor to develop a roadmap for eliminating child lead poisoning in the state. The report suggested that mitigating occupational lead exposures would protect children, pregnant mothers, and the unborn from lead brought home from work.¹⁰

Our collaboration with MIOSHA began in early 2016. On December 11, 2018, Michigan became the first state in the nation (to our knowledge) to lower acceptable blood lead levels for workers. The new rules mandate removal of employees from lead exposure when their BLL reaches 30 $\mu\text{g}/\text{dL}$. Individuals cannot return to a work setting with lead exposure until their BLL is below 15 $\mu\text{g}/\text{dL}$ (vs 40 $\mu\text{g}/\text{dL}$ currently). This change in occupational standards for lead exposure, while still not fully protective, better reflects the current state of knowledge regarding the health hazards of lead, serving to enhance the protection of workers from harms that we know occur at lower levels.

It is important that Federal OSHA and other State-Plan standards are amended to acknowledge what we know about the health effects of lead to better protect workers. Indeed, we join many in this country and elsewhere who have made the call previously for such change so as to spare

workers and their families the toxic effects of lead exposure at work.¹¹⁻¹³

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