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Patient Info:

Researchers Assess Exposure to Metal Emissions in Marietta

CINCINNATI—University of Cincinnati (UC) environmental health experts are trying to determine the extent of metal exposure in a community chronically exposed to manganese, lead and chromium. This information will be used to justify larger studies to determine the effects of these trace metals on human health.

Erin Haynes, DrPH, is leading a pilot study to evaluate about 100 residents from Marietta, Ohio, and nearby communities for potentially dangerous exposures to manganese, chromium and lead.

"Manganese exposure is a significant global public health problem that merits further study," says Haynes, assistant professor of environmental health at UC. "It's a known neurotoxin, yet the specific neurological effects from environmental exposure have not been fully explored."

According to the U.S. Environmental Protection Agency (EPA), all three metals are being emitted at from Marietta's Eramet facility, the leading manganese refinery in the United States and Canada.

Manganese is a metal used widely in the production of aluminum alloys, batteries and fertilizers. It is also added to unleaded gasoline to reduce engine knocking during combustion.

"The problem is that during the refinery process, manganese particles are released into the air," says Haynes. "When we breathe them in, they can travel directly to the brain and potentially cause neurological and behavioral disorders. We don't know at what level these effects occur, and we are specifically interested in studying the effects of these metals on infants and children."

A certain amount of manganese is essential for bone metabolism and enzyme reactions in the human body, but research has shown that excessive amounts can lead to a neurological disorder (manganism) similar to Parkinson's disease. Previous research also suggests that exposure to manganese may magnify the toxicity of lead, which can cause stunted intellectual and physical growth in children.

Haynes is recruiting 100 people of all ages who have lived within a 10-mile radius of Eramet for at least five years.

Her team will collect small blood samples from each study participant and analyze them for the metals manganese, lead and chromium. The researchers will also collect hair samples for manganese testing.

Researchers will ask an additional 50 study participants to participate in a postural sway test to measure their ability to maintain balance. These participants will complete a brief health survey and have their height and weight measured. This data will be used to help determine whether there is a correlation between levels of metals in the blood and the body's ability to maintain balance.

"We want to determine the extent of metal exposure in this community," adds Haynes. "Data from this pilot study will be used to justify a larger study of the Marietta population to determine if these emissions cause health problems."

UC researchers will collect study data from 9 a.m. to 6 p.m. on Friday, Oct. 27, and Saturday, Oct. 28, at Washington State Community College, 710 Colegate Dr. in Marietta. Individual testing will take about an hour and participants are compensated for their time. Recruitment will begin the first week of November for a second round of testing scheduled for Nov. 15 and 16.

This pilot study is supported by grants from the National Institutes of Environmental Health Sciences (NIEHS), EPA and UC's Center for Environmental Genetics.

For more information on enrolling in this study, contact Stephanie Wessel at (513) 558-5816 or stephanie.wessel@cchmc.org.

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