

# MICHIGAN



## MICHIGAN STATE UNIVERSITY: Prevention of work-related injuries & illnesses through research & investigation

### INVESTIGATION/RESEARCH Prevent Work-Related Asthma and Hard Metal Lung Disease from Cobalt Exposure

From 1988 to 2018, 38 cases of work-related asthma (WRA) and 19 cases of hard metal lung disease from exposure to cobalt were identified in Michigan. In Michigan, cobalt exposure is primarily associated with work in tool and die manufacturing. Workers can be exposed to cobalt via inhalation. In addition to lung disease, exposure to cobalt can also cause heart disease (cardiomyopathy) and allergic dermatitis. The International Agency for Research on Cancer (IARC) has determined that cobalt is possibly carcinogenic to humans (Group 2B) and probably carcinogenic to humans (Group 2A) when cobalt exposure occurs when contained in tungsten carbide. Examples of WRA and hard metal lung disease from exposure to cobalt:

- A female in her 30s developed WRA from exposure to cobalt working as a powder mix separator at a magnet manufacturing facility. She wore a paper mask. She was evaluated by a physician who strongly urged the company to move her to a different job. However, she continued to work this job. A MIOSHA enforcement inspection at the facility found exposures to cobalt above the permissible limit, and 19% of co-workers interviewed during the inspection were bothered at work by daily or weekly shortness of breath, wheezing or chest tightness, or new-onset asthma since working at the facility. The company was cited for overexposure to cobalt, and an inadequate and incomplete respiratory protection program.
- A male died in his 50s from hard metal lung disease. He worked as a grinder and tool maker for eight years at a tool and die shop. A lung biopsy confirmed he had interstitial fibrosis. He quit this job because of his diagnosis, but his breathing problems worsened. Shortly before he died, pulmonary function testing showed FEV1/FVC ratio 93% of predicted, FVC 45% of predicted and FEV1 57% of predicted. A MIOSHA enforcement inspection at the facility found exposures to cobalt above the permissible limit, and 20% of co-workers interviewed were bothered at work by daily or weekly shortness of breath, chest tightness or wheezing. The company was cited for overexposure to cobalt, lack of a respiratory protection program, and violations of the hazard communication standard.

### TO PREVENT THE DEVELOPMENT OF LUNG DISEASE FROM COBALT EXPOSURE

- **Employers should recognize** that individuals working with cobalt *and co-workers in the vicinity* can develop WRA or hard metal lung disease from exposure to cobalt, even when exposures are within OSHA's permissible exposure limit (PEL). The Michigan OSHA PEL is 0.05 mg/m<sup>3</sup>. The federal OSHA PEL is 0.1 mg/m<sup>3</sup>.
- **Employers should use engineering controls such as providing appropriate, task-specific ventilation, require personal protective equipment such as appropriate NIOSH-approved respirators, gloves and clothing, and institute effective housekeeping and personal hygiene programs** to minimize exposures.
- **Get involved!** Workers who work around cobalt should familiarize themselves with their company's health and safety programs/policies, cobalt's safety data sheet (SDS), ventilation options and personal protective equipment.
- **Healthcare professionals should take a detailed occupational history** of workers who present with adult onset asthma or lung disease, including industry, job title, *tasks performed*, and any reported exposures.

#### DID YOU KNOW?

- The MIOSHA PEL for cobalt is 0.05 mg/m<sup>3</sup>, which is lower than the federal OSHA PEL of 0.1 mg/m<sup>3</sup>.
- Workers who develop WRA from cobalt who are removed from exposure are likely to continue to have symptoms but are less likely to get worse.
- 41% of the workers had at least one trip to the Emergency Department, and 27% required hospitalization.
- A third of the workers continued to work in the same environment after their diagnosis.
- WRA and hard metal lung disease can occur in work areas that are within the allowable workplace exposure limits.
- An industry where the demand for cobalt is increasing involves battery production for electric vehicles.

MIOSHA: Air Contaminants for General Industry Standard:  
[https://www.michigan.gov/leo/0,5863,7-336-78421\\_11407\\_15368-39941--,00.html](https://www.michigan.gov/leo/0,5863,7-336-78421_11407_15368-39941--,00.html)

Public Health Statement for Cobalt:  
<https://www.atsdr.cdc.gov/PHS/PHS.asp?id=371&tid=64>

NIOSH Overview of Cobalt:  
<https://www.cdc.gov/niosh/topics/cobalt/default.html>

IARC Monograph. Cobalt in Hard Metals and Cobalt Sulfate Vol. 86 <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono86.pdf>