11422: Public Health Response to Occupational and Take-Home Lead Exposures Associated with a Lead Oxide Manufacturing Plant — North Carolina, 2016 – 2018

Monday, June 3, 2019
11:30 AM - 12:00 PM
Raleigh Convention Center - 302C

BACKGROUND: In May 2016, epidemiologists with the North Carolina Division of Public Health (NCDPH) observed elevated blood lead levels (BLLs) among employees of a lead oxide manufacturer (Company A) and their children. Investigations for risk factors associated with occupational and take-home lead exposures were performed and resulted in a multi-agency response working with Company A's executive team, with a focus on process-specific engineering control recommendations. NCDPH continued to monitor the BLLs of Company A's employees and their children and perform interventions as needed.

METHODS: We defined an elevated BLL as ≥5 µg/dL in both adults and children. We continued to monitor BLLs of Company A employees and children during 2016–2018 by reviewing bi-monthly lab results and updating local health department officials on BLL trends. We continued public health investigations and recommended interventions through interagency response efforts.

RESULTS: Maximum BLL results per employee were collected bi-monthly from 82 persons ever employed at Company A during 2016–2018. Employees' median BLLs increased from 36 µg/dL (range: 22–48) in January 2016 to 39 µg/dL (range: 10–53) in November 2018. Seven employees with BLLs >60 µg/dL were identified during 2017–2018. Six children had elevated BLLs out of 19 children with BLLs drawn since January 2016. Three of these six children had elevated BLLs identified in 2018, with a median diagnostic BLL of 15 µg/dL (range: 5–42). Annual average median BLLs among all employees was 1.03 times greater (CL=0.75,1.36) in 2018 than in 2016; 1.01 times greater (CL=0.74,1.37) among operators, 1.17 times greater (CL=0.90,1.53) among plant managers/foreman, and 1.22 times greater (CL=0.92,1.61) among maintenance workers.

CONCLUSIONS: Lead oxide manufacturing is an industry with high risk for lead exposure, contamination, and take-home exposure for its employees and their families. Response efforts have resulted in closer collaboration and more timely responses by NCDPH adult and child BLL surveillance functions. Company A has developed a corrective action plan to prevent take-home lead exposure and an abatement plan with NCOSHA to reduce permissible exposure limits in the company to <50 µg/m^3. However, despite collaborative efforts by multiple agencies to establish exposure control initiatives, progress in Company A's response has taken years to gain momentum. BLLs among high-risk employees of Company A continue to increase among most job categories, even among job categories not directly involved in the manufacturing processes such as cleaners and truck drivers. More extensive process engineering interventions may be necessary to prevent additional lead contamination.

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