



Occupational Lung Disease Bulletin for Healthcare Providers

Massachusetts Department of Public Health

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Silicosis: A Hidden Work-Related Respiratory Epidemic

Severe silicosis in engineered stone fabrication workers: are Massachusetts workers at risk?

Small businesses, beautiful popular manufactured stone countertops, largely Latino workforce, and silica. These elements have come together to cause multiple cases of severe work-related respiratory disease associated with cutting these manufactured stone pieces. Silicosis was believed to be a disease of the past—associated with smelters, mining and stone carving—and rarely seen in current clinical practice in Massachusetts. A 2019 report about silicosis cases from engineered stone fabrication facilities in four states revealed hazards, challenges in diagnosis, and risks for the young Hispanic men who work in this industry. There are more or less 300 countertop businesses in Massachusetts and the same hazardous conditions may be present here. In this bulletin, we provide an overview of the report findings, reminders about Massachusetts reporting requirements, and tips for providers when treating patients who work with engineered stone and other silica-containing materials.

Silicosis Overview

Silicosis is an incurable occupational lung disease caused by inhaling respirable crystalline silica (RCS). Inhaled RCS triggers inflammation and fibrosis in the lungs. Silica exposure is associated with increased risk of tuberculosis, lung cancer, emphysema (including in non-smokers), autoimmune diseases and kidney disease. Engineered stone, used for countertops, can contain more than 90% silica compared to less than 45% in granite. Workers who fabricate, cut, polish or grind these stone slabs can be exposed to silica dust with a risk of accelerated silicosis (latency 4-10 years). A recent Morbidity and Mortality Weekly documented 18 cases of silicosis, including two deaths, among fabrication workers in four states over a three year period.¹ Previously only one case of silicosis in countertop workers had ever been reported in the United States. The 18 cases were primarily male and Hispanic, and 11 were under 50 years of age, with some even in their 30s. Their tenure in this field ranged from only two years to 31 years. In addition to silicosis, two patients had latent tuberculosis infections and five had concurrent autoimmune disease. In fact, silicosis was not suspected in the patients with autoimmune disease until they had a lung biopsy.

Subsequent to the MMWR report, screening of stone workers in Australia continued, finding 99 confirmed cases of silicosis; nearly all had minimal or no symptoms, and no respiratory function deficits.² By the time a worker develops symptoms there are no treatments, apart from lung transplantation.

Dry cutting artificial stone without any dust control can generate RCS levels over a 30 minute period that are over 800 times the OSHA Permissible Exposure Limit for an 8 hour day.^{3,4} Wet cutting in combination with local exhaust ventilation can reduce exposures significantly. If needed, then respirators designed for particulates can also be used.

Remember to report cases of suspected work-related lung disease to us by mail, fax (617-624-5696) or phone (617-624-5632). The confidential reporting form is available on our website at www.mass.gov/dph/ohsp.

To request a paper copy, provide comments, or to contribute an article to the Occupational Lung Disease Bulletin, contact us at MDPH.OHSP@state.ma.us or 617-623-5632.



Worker is performing wet cutting. Image is courtesy of NIOSH.

What Should You Do?

- Ask your patients about work—what they do and if it affects their health.
- For patients with respiratory symptoms—ask about conditions at work.
- For patients who work in stone fabrication—conduct pulmonary function testing, chest x-ray and tuberculosis screening . Given the high rate of false negatives with x-ray, consider low dose high resolution CT.
- Report all suspected and confirmed cases of work-related lung disease to the Massachusetts Department of Public Health.



Silicosis is preventable with effective workplace controls, including wet cutting and local exhaust ventilation. If these are not sufficient, respirators designed for particulates are needed. Diagnosis and early identification of silicosis are critical to knowing the true prevalence of this disease and implementing primary and secondary prevention.

References and resources

1. MMWR September 27, 2019 Severe Silicosis in Engineered Stone Fabrication Workers — California, Colorado, Texas, and Washington, 2017–2019 <https://www.cdc.gov/mmwr/volumes/68/wr/mm6838a1.htm>
2. Edwards G. Accelerated silicosis—an emerging epidemic associated with engineered stone. Comment on Leso V. et al. Artificial stone associated silicosis: a systematic review. *Int J Environ Res Public Health* 2019 16(4), 568
3. Occupational Safety and Health Administration, Silica, crystalline, 29 CFR 1910.1053 <https://www.osha.gov/dsg/topics/silicacrystalline/> and https://www.osha.gov/dsg/topics/silicacrystalline/generalindustry_info_silica.html
4. Levin K, McLean C, Hoy R. Artificial stone-associated silicosis: clinical-pathological-radiological correlates of disease. *Respirology Case Reports* 2019 7(7):1-5
5. Silicosis UpToDate 2019 www.uptodate.com
6. MDPH, Reporting of work-related injuries and illnesses <https://www.mass.gov/guides/occupational-disease-and-injury-reporting> and MDPH, Occupational Health Surveillance Program, Occupational Lung Disease Bulletins <https://www.mass.gov/lists/occupational-lung-disease-bulletins>

Reminder: Report work-related lung diseases to the Occupational Health Surveillance Program, by mail (250 Washington St, 4th Floor, Boston MA, 02108), fax (617-624-5696) or telephone (617 624-5632).