

Airways Obstruction Among Older Construction and Trade Workers at Department of Energy Nuclear Sites

John M. Dement, PhD, CIH,^{1*} Laura Welch, MD,² Knut Ringen, PH, MHA, MPH,³
Eula Bingham, PhD,⁴ and Patricia Quinn, BA²

Background A study of chronic obstructive pulmonary disease (COPD) among 7,579 current and former workers participating in medical screening programs at Department of Energy (DOE) nuclear weapons facilities through September 2008 was undertaken.

Methods Participants provided a detailed work and exposure history and underwent a respiratory examination that included a respiratory history, respiratory symptoms, a posterior–anterior (P–A) chest radiograph classified by International Labour Office (ILO) criteria, and spirometry. Statistical models were developed to generate group-level exposure estimates that were used in multivariate logistic regression analyses to explore the risk of COPD in relation to exposures to asbestos, silica, cement dust, welding, paints, solvents, and dusts/fumes from paint removal. Risk for COPD in the study population was compared to risk for COPD in the general US population as determined in National Health and Nutrition Examination Survey (NHANES III).

Results The age-standardized prevalence ratio of COPD among DOE workers compared to all NHANES III data was 1.3. Internal analyses found the odds ratio of COPD to range from 1.6 to 3.1 by trade after adjustment for age, race, sex, smoking, and duration of DOE employment. Statistically significant associations were observed for COPD and exposures to asbestos, silica, welding, cement dusts, and some tasks associated with exposures to paints, solvents, and removal of paints.

Conclusions Our study of construction workers employed at DOE sites demonstrated increased COPD risk due to occupational exposures and was able to identify specific exposures increasing risk. This study provides additional support for prevention of both smoking and occupational exposures to reduce the burden of COPD among construction workers. *Am. J. Ind. Med.* 2009. © 2009 Wiley-Liss, Inc.

KEY WORDS: DOE; COPD; group-level exposures; asbestos; silica; welding; construction; trades; radiograph; parenchymal; pleural; surveillance

¹Division of Occupational and Environmental Medicine, Duke University Medical Center, Durham, North Carolina

²The Center for Construction Research and Training, Silver Spring, Maryland

³Stoneturn Consultants, Seattle, Washington

⁴Department of Environmental Health, University of Cincinnati Medical Center, Cincinnati, Ohio

Contract grant sponsor: U.S. Department of Energy; Contract grant number: DE-FC01-06EH06004.

*Correspondence to: John M. Dement, Professor, Division of Occupational & Environmental Medicine, Department of Community & Family Medicine, Duke University Medical Center, 2200 West Main Street, Suite 400, Durham, NC 27710. E-mail: john.dement@duke.edu

Accepted 1 November 2009
DOI 10.1002/ajim.20792. Published online in Wiley InterScience
(www.interscience.wiley.com)