

OREGON PUBLIC HEALTH DIVISION • DEPARTMENT OF HUMAN SERVICES

WINDED AT WORK

*It's strange that words are so inadequate. Yet, like the asthmatic struggling for breath, so the epidemiologist must struggle for words.**

One in ten Oregonians struggle for breath due to asthma—a greater proportion than in the U.S. as a whole. Estimates vary, but between 15 and 33 percent of adult asthma is attributable to work-related exposures.¹⁻³ However, diagnosis of work-related asthma (WRA) is challenging because it is difficult to differentiate general environmental from specific occupational exposures.⁴ Health care providers are integral to the recognition and treatment of WRA, and they can play an important role in its prevention.

BURDEN OF WORK-RELATED ASTHMA

Work-related asthma is the most common occupational lung disease in developed countries.^{2,5} The U.S. Occupational Safety and Health Administration (OSHA) estimates that at least 11 million workers in a wide range of industries and occupations are exposed to agents known to be associated with WRA. The financial burden of WRA in the United States is estimated at \$1.6 billion annually. Although WRA is preventable, there is no evidence that it is decreasing.⁶

OREGON DATA

According to data from the Oregon Behavioral Risk Factor Surveillance System (BRFSS), asthma prevalence in Oregon adults has increased from 188,000 (7.3%) in 1999 to 274,000 (9.9%) in 2005. This is higher than the U.S. prevalence of 7.9%. In an Oregon call-back survey of adults with asthma, 52.8% of those reporting current asthma said that their asthma was caused or aggravated by any job

they ever had. However, only 13.5% of those reporting asthma said that they had discussed with their health care provider that their asthma was related to their work.

In general, work-related asthma appears to be less well controlled than asthma unrelated to work. Among call-back participants with asthma, those with WRA were more likely to have had their usual activities limited in the past 12 months (77% compared to 59%) and were less likely to have used asthma medications (57% versus 63%).

DIAGNOSIS

Work-related asthma falls into 3 general categories:

- Immunologically mediated asthma resulting from sensitizers in the workplace (sensitizer-induced);
- Asthma that results from acute exposure to irritants in the workplace (reactive airways dysfunction syndrome or RADS);
- Pre-existing asthma exacerbated by workplace exposures.

Work-related asthma results from both environmental and host factors. The incidence of WRA varies by industry and by chemicals used. More than 250 substances are known or believed to cause or exacerbate WRA.⁷ Studies in high-risk industries have found a dose-response relationship between exposure level and WRA prevalence. However, even when multiple workers experience the same level of exposure, only a small proportion develop WRA, suggesting that host factors also play a role.⁸

Diagnosis of WRA is vital since it is expensive to treat, preventable, and partially or completely reversible if exposures are controlled early.⁴ Health care providers can help identify WRA by asking about asthma symptoms and workplace activities.

A WRA diagnosis should be considered in all cases of new-onset or substantially deteriorating symptoms in working adults.^{5,9} The diagnosis is supported by evidence of an association between airway obstruction and workplace exposure(s).

ILLUSTRATIVE CASE

Work-related asthma can be very serious, as illustrated by the following case. A 37-year-old self-employed car painter was admitted to the hospital with asthma symptoms. He had first suffered these symptoms 5 years earlier, and they were thought to have been related to his occupation. He had been working in the same environment for more than 20 years. He was diagnosed with occupational asthma induced by isocyanates and advised to change his job or avoid the use of polyurethane paints. Polyurethane paints contain isocyanates, which are powerful respiratory sensitizers. He nevertheless continued to paint cars, using bronchodilators and steroids to mitigate his asthma.

Six years later, he was wearing a mask and spraying a car with 2-component polyurethane paint when he experienced a severe, prolonged asthma attack. Despite medication, he remained symptomatic, especially at night. He returned to work, sprayed the polyurethane paint again, and developed severe asthma exacerbation requiring emergency treatment. He died in the ambulance en route to the hospital.¹⁰

Deaths from WRA are rare, but this case demonstrates what can happen if workplace exposures to asthma precipitants are not addressed.

PREVENTION RECOMMENDATIONS

Work-related asthma is a significant public health issue in Oregon, but it can be prevented and managed with the involvement of workers,

*with apologies to T.S. Eliot



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Table. Prevention strategies for work-related asthma

Type of Prevention	Activity	Example
Primary	Eliminate exposure	<ul style="list-style-type: none"> • Replace sensitizing substances with safer alternatives • Limit number of people exposed
	Reduce exposure	<ul style="list-style-type: none"> • Wear personal protective equipment (PPE) such as respirators • Conduct skin testing for specific IgE antibodies
	Identify susceptible individuals	<ul style="list-style-type: none"> • Conduct pre-employment screening to reduce susceptible worker population* • Conduct skin testing for specific IgE antibodies
Secondary	Detect disease	<ul style="list-style-type: none"> • Provide routine medical screenings • Conduct skin testing for specific IgE antibodies
	Reduce exposure	<ul style="list-style-type: none"> • Better outcome when detected early and worker removed from exposure
Tertiary	Prevent permanent damage	<ul style="list-style-type: none"> • Use corticosteroid inhalers and bronchodilators

*Screenings may identify workers at high risk for WRA, but they are also resource-intensive and present ethical and legal issues.

employers and health care providers, through strategies designed to eliminate or reduce exposure and detect or treat the illness (Table).

FOR MORE INFORMATION

The following are resources to assist those interested in helping Oregonians breathe easier on the job.

- Asmapro: A web server for occupational asthma. Available at: www.remcom.fr/asmanet/asmapro/asmatwork.htm.

- National Institute for Occupational Safety and Health (NIOSH). Asthma and allergies. Available at: www.cdc.gov/niosh/topics/asthma/default.html.
- Oregon Asthma Program. Available at: www.oregon.gov/DHS/ph/asthma/index.shtml.
- Oregon Worker Illness and Injury Prevention Program. Available at: www.oregon.gov/dhs/ph/owiipp/asthma.shtml.

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