

Physicians' Alert:

Work-Related Asthma (WRA) among Construction Workers

This Alert was developed to help ensure that all construction workers at risk of developing asthma or worsening their pre-existing asthma from work exposures are properly diagnosed and treated. **Please:**

- (1) read and print this Alert;**
- (2) keep the Best Practice tips to help you work safely; and**
- (3) fill in the "To My Doctor" form and give it to your doctor to include in your medical records.**

Best Practices for You

The following are selected best practices for preventing work-related asthma:

- If required, wear a respirator that you have been fit-tested and trained to use. Certain tasks, such as spraying insulation, require respirators. If you are not involved in the application, stay out of the area during spraying.
- Wear gloves and skin protection when working with chemicals and dusty substances. (Visit www.choosehandsafety.org for information on glove selection and use.)
- See a physician for a cough, shortness of breath, wheezing or chest tightness that is worse at work or soon after work and goes away or improves when not working.
- If you have asthma, make note of what makes your asthma worse. It is important to limit exposure to substances that trigger your asthma since they can worsen your symptoms and increase the need for medicine.

To learn more visit:

- OSHA Safety and Health Topics: Occupational Asthma Website
<https://www.osha.gov/SLTC/occupationalasthma/>
- OSHA Respiratory Protection eTool
<https://www.osha.gov/SLTC/etools/respiratory/>
- OSHA Respirators QuickCard
https://www.osha.gov/OshDoc/data_Hurricane_Facts/respirators.pdf
- NIOSH Respirator Trusted-Source Information
https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/RespSource.html

©2018, CPWR-The Center for Construction Research and Training. All rights reserved. CPWR is the research and training arm of NABTU. Production of this document was supported by cooperative agreement OH 009762 from the National Institute for Occupational Safety and Health (NIOSH). The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH.

Physicians' Alert:

Work-Related Asthma (WRA) among Construction Workers

To My Doctor: I am a construction worker who has frequent occupational exposure to chemicals, dusts and harsh weather conditions. Please keep this information for reference and to aid in evaluation of possible lung conditions

This document should be filed in the medical records of (patient's full name):

Date of Birth: _____ / _____ / _____
Month Day Year

Your patient is a construction worker with exposures to construction dust and chemicals.

Construction workers are exposed to a large number of substances (chemicals, fumes, dusts) and conditions (e.g. extremes of temperature, humidity) that can cause work-related asthma (WRA), either new onset asthma (occupational asthma) or exacerbation of prior asthma (work-exacerbated asthma). Both allergens and irritants can cause WRA.

Construction workers can develop WRA from exposures to: isocyanates in polyurethane coatings, glues, and foam insulation; epoxies in glues; disinfectants (e.g. bleach or ammonium chloride in cleaning compounds used to kill mold); chromium in welding fumes or cement dust; wood dusts; diesel exhaust; welding fumes; formaldehyde in wood board and paints; and methyl methacrylate in reinforced concrete layers. WRA in construction workers may also occur from spilled or leaked acids such as muriatic acids used for cleaning or from other caustic materials.

Many products and processes used in construction can trigger asthmatic symptoms in persons with prior asthma, including childhood asthma. Dusts and fumes generated by working with wood, brick or cement, using spray products, welding or hot work, and renovation and demolition work, as well as work in extreme weather conditions (hot, cold, high-low humidity) can trigger asthma symptoms. Table 1 contains a list of substances and tasks that can cause WRA.

Chronic exposure to the many exposures in construction work over many years can also lead to the development of chronic obstructive pulmonary disease (COPD) in smokers and non-smokers. The combination of work exposures with cigarette smoking increases the risk from either one alone.

Diagnosing WRA

Consider work-related asthma in **ALL** adults with new-onset asthma, asthma symptoms or exacerbation of previously controlled asthma. The following questions, recommended in the American College of Chest Physicians Consensus Statement, can be used to screen patients for work-related asthma:⁽²⁾

- 1) Were there changes in work processes in the period preceding the onset of symptoms?
- 2) Was there an unusual work exposure within 24 hours before the onset of initial asthma symptoms?

- 3) Do asthma symptoms differ during times away from work such as weekends or holidays or other extended times away from work?
- 4) Are there symptoms of allergic rhinitis and/or conjunctivitis symptoms that are worse with work?

If the patient has positive responses to the above questions, particularly questions two or three, confirm the diagnosis of asthma, including history of childhood asthma, age of onset, treatment and effectiveness of inhalers. Evaluate the patient for reversible airflow obstruction by performing spirometry with pre/post bronchodilator testing or methacholine challenge testing if normal on baseline spirometry. Review the possible exposures and/ or work conditions that trigger the patient's asthma symptoms. Assessing whether the patient's asthma is associated with work is most commonly done by a careful occupational history documenting the temporal relationship between onset of asthma and changes in asthmatic symptoms and work. Additional testing, such as the patient keeping a diary of peak flow tests performed two weeks at and two weeks or more away from work, or immunologic tests for certain sensitizers, when positive add greater diagnostic certainty. Whenever possible, perform these tests prior to advising the patient regarding employment. Consider referring the patient to a pulmonologist or occupational medicine physician familiar with work-related diseases for assistance with diagnosis and management, and to protect the patient's legal rights in the workers' compensation system.

For more information about occupational health, see the Association of Occupational and Environmental Clinics (AOEC) at www.AOEC.org.

References:

- 1) The Association of Occupational and Environmental Clinics (AOEC) lists causes of work-related asthma <http://www.aoecdata.org/ExpCodeLookup.aspx>. This listing includes other known occupational and environmental exposures. To look at just asthmagens (substances known to cause asthma) click on "Display All Asthmagens".
- 2) Tarlo SM, Balmes J, Balkissoon et al. Diagnosis and Management of Work-Related Asthma. American College of Chest Physicians Consensus Statement. Chest 2008; 134: Supplement 1s-41s.
- 3) Vandeplass O, Suojalehto H, Cullinan P. Diagnosing Occupational Asthma. Clin & Exp Allergy 2016; 47:6-18.

Table 1: Exposures and Tasks in the Construction Industry that Cause Work-Related Asthma

Substance	Task
Acids	Cleaning, etching
Aziridine, Polyfunctional	Painting, parquet varnishing
Chromium	Welding, cement dust
Cleaning Agents - Bleach, Ammonium Chloride Compounds (Quats)	Cleaning water damage areas, mold
Diesel fumes	Being around construction vehicles
Epoxy	Gluing tiles/ carpeting
Formaldehyde - Phenol-formaldehyde resin, Urea-formaldehyde resin	Working with particle board, applying lacquers/paint
Isocyanates	Applying spray-on thermal insulation or Polyurethane
Nickel	Welding, acetylene torch cutting
Methyl methacrylate	Laying reinforced concrete
Mixing acid and bleach or ammonia and bleach	Cleaning
Polyethylene Terephthalate/ Polybutylene Terephthalate	Applying polyester coating
Soldering Flux - Alkyl ethyl ethanolamine, Amino ethyl alcohol/ Polypropylene glycol - Colophony, Zinc Chloride/Ammonium chloride	Electrical soldering
Triglycidyl Isocyanurate	Powder painting
Welding Fumes	Welding
Wood Dust - Ash, California Redwood, Eastern and Western Cedar, Oak	Cutting wood