

Fact Sheet



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Diisocyanates and Occupational Asthma



The purpose of this fact sheet is to alert the practitioner to the importance of considering the potential for exposure to diisocyanates, a common cause of asthma, in the diagnostic evaluation of patients. Exposure to diisocyanates has been shown to cause respiratory sensitization in workers who may not have had asthma before.

Exposure to Diisocyanates is a Leading Cause of Occupational Asthma

- ◆ Exposure to diisocyanates may cause serious or fatal respiratory disease.
- ◆ Re-exposure of sensitized workers can precipitate asthma attacks at very low exposures.
- ◆ Among adults diagnosed with new onset asthma in the United States, it is estimated that 15% of the cases are due to workplace exposure. One of the most common causes is workplace exposure to products containing a diisocyanate compound.
- ◆ In Connecticut, a survey of reported asthma and Reactive Airways Dysfunction Syndrome (RADS) cases indicates that 21% of the respondents were exposed to diisocyanates.

Various Uses of Diisocyanates

Diisocyanates are widely used in the manufacture of polyurethane products such as flexible and rigid foams, molded parts, and coatings such as paints and varnishes. Diisocyanates are increasingly used in the automobile industry, autobody repair, and building insulation materials. Although OSHA currently regulates only the monomer form of toluene diisocyanate (TDI) and methylenebis diisocyanate (MDI), all of the diisocyanates, including hexamethylene diisocyanate (HDI), isophorone diisocyanate (IPDI), and their prepolymers and oligomers, are presumed to be capable of causing asthma.

Paths of Exposure

Exposure to diisocyanates may occur by inhalation of vapor aerosol, as well as by dermal contact. An occupational cause of asthma should be suspected if the patient works with any diisocyanate. It is important to note that symptoms may occur during, shortly after exposure, or after a delay of 5 hours or more.

Health Effects of Diisocyanates

Chronic inhalation exposure to diisocyanates has been shown to cause asthma, dyspnea and pulmonary edema.

- ◆ Respiratory sensitization may occur from inhalation, or possibly dermal exposure.
- ◆ Acute exposure to diisocyanates may cause RADS and hypersensitivity pneumonitis.

Preventive Recommendations

Persons working with diisocyanates should be advised to avoid inhalation of vapors and aerosols and to avoid skin contact with the chemical or incompletely cured product. It may be helpful to have their workplace evaluated by an industrial hygienist. People who are sensitized may be unable to work around diisocyanates at all. Physicians should advise their patients about the adverse health effects of exposure to diisocyanates.

REMEMBER, ALL WORK-RELATED DISEASES INCLUDING OCCUPATIONAL ASTHMA ARE REPORTABLE. THE PHYSICIAN'S REPORT OF OCCUPATIONAL DISEASE FORM IS AVAILABLE ON THE DPH WEBSITE AT: www.dph.state.ct.us/BCH/EEOH/occupational_health_program.htm

For more information contact the Division of Environmental Epidemiology and Occupational Health at (860) 509-7744.

References

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