

# SENSOR Occupational Lung Disease Bulletin

A project of the Massachusetts Department of Public Health's Occupational Health Surveillance Program,  
the Massachusetts Thoracic Society, and the Massachusetts Allergy Society

Massachusetts Department of Public Health, Occupational Health Surveillance Program, 6th floor, 250 Washington Street,  
Boston, MA 02108, Tel: (617) 624-5632, Fax: (617) 624-5696

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Dear Health Care Provider:

Surveillance findings from several states identify cleaning agents as a potential cause of work-related asthma. Her in Massachusetts, more than 10% of the work-related asthma cases reported to SENSOR, list cleaning products as the suspected agent. The Michigan SENSOR program recently summarized data on over 50 cases of work-related asthma involving cleaning compounds. In this issue we present several case reports and highlight some of the frequently reporting cleaning products associated with breathing problems.

The term "cleaning agents" encompasses a very broad category of products. During the next year, SENSOR staff plan to conduct more intensive follow-up of cases associated with cleaning products to see if we can identify specific product components which may cause asthma. We will be making efforts to obtain Material Safety Data Sheets on specific products identified by cases. We encourage you to consider exposures to cleaning agents when talking to patients about potential workplace exposures that cause breathing problems and to urge patients to obtain specific product information. We would be happy to work with you and your patients to obtain relevant Material Safety Data Sheets. Please call us if you have questions or need assistance.

Sincerely,

Catharine M. Tumpowsky, MPH

Occupational Asthma Surveillance Project

## Cleaning Products and Risk of Asthma

### Case One

A 38 year old woman who worked as a lab technician in a hospital developed wheezing, cough, chest tightness and shortness of breath within 10 minutes of exposure to a floor cleaner which was applied to an adjacent work area. She was seen in the emergency room and admitted to the ICU after this incident. The woman had a history of asthma and allergies but reports that her symptoms have become more severe since this incident despite the fact that she is no longer exposed to the floor cleaner.

### Case Two

A woman in her late 20's who worked as a laboratory technician performing surgical procedures on research animals, developed wheezing, cough, chest tightness and shortness of breath one year after she began working for her employer. Her symptoms began after she started using a disinfectant which contained hydroxyacetic acid to clean her work area after surgical procedures. Although she had a history of allergies and had been diagnosed with asthma when she was eighteen, she had been symptom-free for more almost 10 years prior to using this product. Once, after she used this product, she was taken to the emergency room for treatment. She has since stopped using this chemical but her breathing problems persist.

### Case Three

A 46 year old woman who worked as a hotel housekeeper developed breathing problems within 3 hours of being exposed to muriatic acid. The muriatic acid was being used to clean the pool area and the housekeeper was cleaning the adjacent hallway. She was treated in the emergency room. Since the incident, her symptoms have persisted and she was diagnosed with asthma one year later. Prior to the incident, she had no history of asthma or allergies. She continues to work for the same employer and although she is no longer exposed to muriatic acid, she finds that many chemicals at home and work trigger her symptoms.

Because of the widespread use of cleaning agents in the workplace, workers, regardless of their occupation, may be exposed frequently. Several cleaning agents have been described as causes of occupational asthma, while others have been reported in the literature as causing chemical pneumonitis, pulmonary edema, or contact dermatitis.

**REPORT JANUARY-MARCH CASES NOW**  
By April 30th, report all occupational lung disease cases seen for the first time in January - March 1998. If you have NOT seen any cases, it is not necessary to return the report form.

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Acute high level exposures to cleaning compounds containing ammonia or bleach have been associated with reactive airways dysfunction syndrome (RADS.) The mixture of bleach and ammonia produces chloramine gas whose toxic fumes cause tearing, rhinorrhea, cough, dyspnea and nausea. These fumes may be lethal. Pulmonary function testing after exposure to chloramine gas has revealed both restrictive and obstructive respiratory diseases.

Cases of work-related asthma involving sensitization to cleaning products are not as well documented.

Disinfectant cleaners may contain known allergens such as: benzylkoniunium chloride, chloramine, chlorhexidine, formaldehyde or glutaraldehyde. Aliphatic polyamides are commonly found in cleaning compounds. Members of this chemical group associated with work-related asthma are ethylene diamine, diethylene triamine, and triethylene tetramine. Similarly the ethanolamines, mono and

triethanolamine, also found in cleaning solutions have been associated with work-related asthma.

Since 1992, 72 cases of work-related asthma have been reported to Massachusetts SENSOR involving exposure to cleaning agents (see Table 1.) In most cases, the individual was the one using the chemical but in some cases, individuals who enter an area where a cleaner has recently been used, have developed sensitization and asthma.

Identifying the specific agent which caused the reaction is difficult. Often workers do not know the names or ingredients of the products they are using or to which they are exposed. It is important to encourage patients to obtain this information from product labels.

*Thank you to Drs. William Patterson and David Christiani for reporting the featured cases to SENSOR.*

**Table 1. Physician Reports of Patients with Work-Related Asthma from Exposure to Cleaning Solutions, Massachusetts SENSOR, March 1992-March 1998.**

INDUSTRY	# CASES	OCCUPATIONS	SUSPECTED AGENTS
Health Care (including hospitals, nursing homes, and dental offices)	40	Nurse (23); Nursing Aide (4); Secretary(3); Janitors (2); Manager; Engineer; Therapist; Plumber; Dental Hygienist; Machine Operator	Bleach; Chlorine; Disinfectants; Misc. Cleaners; Soaps; Floor Stripper; Glutaraldehyde
Misc. Manufacturing	9	Machine Operators (5); Computer Operator; Inspector; Painter; Assembler	Ammonia; Misc. Cleaners; Soaps; Sodium Hydroxide
Education	5	Teacher; Physical Education Teacher; Dental Hygienist (university); Janitor; Groundskeeper	Disinfectants, Misc. Cleaners, Floor Stripper
Hotel	4	Housekeeper (3); Waitress	Misc. Cleaners; Bleach; Muriatic Acid
Personal Services (Drycleaners, Hair Salon)	3	Launderer (2); Hair Dresser	Detergents
Other	11	Animal Care Technician (2); Engineer (2); Mason; Seafood processor; Pet Store Worker; Food Production Worker; Misc. Laborer; Sewage Treatment Worker; Art Teacher;	Ammonia; Disinfectants; Sodium Hydroxide; Bleach

References:

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Savonius B, Keskinen H, Tuppurainen M, Kanerua L. Occupational Asthma Caused by Ethanolamines. *Allergy* 1994; 49:877-881.

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**Number of Lung Disease Cases Reported to MA SENSOR, March 1992-December 1997**

	Oct. 1997	Nov. 1997	Dec. 1997	Total to Date (3/92-12/97)
<b>Asthma</b>	4	20	11	564
<b>Silicosis</b>	0	0	0	12
<b>Asbestosis</b>	0	0	0	123
<b>Chemical Pneumonitis</b>	0	0	0	15
<b>Total Number of Lung Disease</b>	4	20	11	714

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<b>Reports</b>				
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