

March 2006

Dear Health Care Provider,

This issue of the Occupational Lung Disease Bulletin focuses on work-aggravated asthma, preexisting asthma exacerbated by work. Two Massachusetts cases—one reported by a physician and the other identified through a review of emergency department records—are briefly described, and a journal article on work-aggravated asthma is summarized.

OHSP relies upon diagnosis and reporting of cases of work-related asthma from occupational medicine, primary care, and pulmonary practitioners for surveillance and prevention activities. Remember to report suspected and confirmed cases of work-related asthma, including work-aggravated asthma, to OHSP by phone, fax or mail.

To receive your Bulletin electronically, send an email message to: occupational.asthma@state.ma.us

Sincerely,
Elise Pechter MPH, CIH

Work-aggravated asthma¹

Case 1

A 44-year-old non-smoking woman with a history of asthma experienced worsening symptoms when renovation was conducted in her office building. She had worked in this job for six years prior to this incident. She reported wheezing, coughing, chest tightness and shortness of breath starting shortly after renovation activities commenced on the floor above hers. Renovation activities included removal of old plaster walls and installation of new fabric covered partitions and modular furniture made of particle board. Symptoms worsened when they renovated her immediate area. Evaluations by a state agency noted potential formaldehyde exposure from new materials and inadequate ventilation in this historic building.

She used all of her accumulated sick time and was temporarily reassigned to another building. Several efforts to have her return to her work station, without substantial cleaning or changes in conditions, were unsuccessful. Eventually, she applied for and received workers' compensation which covered her medical expenses. She has been able to work for the same agency in an alternate office nearly one year after this case was reported by a pulmonologist.

¹ Adapted from Project SENSOR News, Michigan 14(1) Winter 2002-3 <http://oem.msu.edu/news/Sv14n1.pdf>

Case 2

A 42-year-old emergency room nurse had an exacerbation of her asthma after exposure to a floor buffing product in the hospital. She had been diagnosed with asthma in her 20s, and had a history of allergies to dust, ragweed, cats and hazelnuts. She had never smoked. She had worked in this hospital for two years, and in the emergency department, for one year prior to this incident. She presented to the emergency room with shortness of breath and coughing 10 days after exposure to a floor cleaning product; she was at the end of a Prednisone taper. She received 2 Combivent nebulizer treatments and prescriptions for prednisone and Zithromax and was advised to use her Ventolin inhaler or nebulizer q4-6 hours for three days. This case was identified by review of emergency department records.

There are three ways in which workplace exposures may contribute to the asthma burden: 1) sensitization to a substance at work may cause asthma; 2) over exposure to a high concentration of an irritant at work may cause asthma (Reactive Airways Dysfunction Syndrome); or, 3) exposures at work may aggravate pre-existing asthma as demonstrated in the above case examples. All three categories of work-related asthma (WRA) are reportable to the Massachusetts Department of Public Health.

Aggravation of pre-existing asthma may be a common occurrence but it is infrequently reported to the Massachusetts surveillance system. There are an estimated 458,000 adults in Massachusetts who currently have asthma; the vast majority of these individuals work. Yet only 6 cases of work-aggravated asthma per year are reported to the surveillance system. Of the 578 confirmed cases of work-related asthma identified 1993-2004, only 11% were classified as work-aggravated asthma (WAA). [See the December 2005 *Bulletin*.] This contrasts with the surveillance system in California, which is linked to medical reimbursement, where 35% of the reported work-related asthma was WAA.² Other studies have also shown that WAA is a more significant component of the WRA burden than is reflected in the Massachusetts surveillance data.

² Reinisch F, Harrison RJ, Cussier S, et al. Physician reports of work-related asthma in California, 1993-1996. *Am J Ind Med* 2001;39:72-83.

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The four states (California, Massachusetts, Michigan and New Jersey) that conduct surveillance of WRA compiled data on work-aggravated asthma cases identified from 1993-1995 in all four states combined.³ Cases of work-aggravated asthma (WAA) were compared to cases of new onset asthma (NOA) caused by work. In all states, cases were defined as WAA when the affected individual:

- experienced asthma symptoms or had treatment for asthma in the two years prior to entering a new work setting; **and**
- experienced an increase in asthma symptoms, increased use of asthma medications or use of medical services after entering the new exposure setting.

Table 1 Consequences of work-related asthma

| | WAA n=210 | NOA n=891 |
|--|--------------|--------------|
| Still have breathing problems | 75% | 79% |
| Visit ER for work-related breathing problems | 59% | 52% |
| If yes, number of times: | | |
| One | 53% | 45% |
| More than one | 44% | 51% |
| Data missing | 3% | 4% |
| Hospitalized for work-related breathing problems | 23% | 25% |
| If yes, number of times: | | |
| One | 55% | 53% |
| More than one | 27% | 35% |
| Data missing | 18% | 12% |
| Applied for workers' compensation | 21%* | 40% |
| Percent with application decided | 57% | 47% |
| Of those application decided: | | |
| Awarded | 72% | 77% |
| Denied | 28% | 23% |

*p<0.01, by chi square

The two year time period is arbitrary but was agreed upon by the four participating states. The "new setting" includes not only a new job, but also a change in work process or introduction of a new substance into the workplace.

A total of 1101 cases of WRA were identified during this period from the four states. Of these, 19.1% (210) were classified as WAA. Compared to the NOA cases, individuals with WAA were:

- younger (mean age 38 years v 42 years),
- more likely to be female (69% v 53%)
- more likely to be non-white (31% v 21%)
- less likely to have ever smoked cigarettes (39% v 53%).
- more likely to have ever been told they had allergies.

Persons with WAA reported somewhat different exposures associated with their asthma; they were most likely to report dusts, while those with new onset asthma were most likely to report diisocyanates.

As shown in Table 1, both those with WAA and NOA still experienced breathing problems at the time of the interview, and were equally likely to have been hospitalized or treated in emergency rooms. However, individuals with WAA were less likely to apply for workers' compensation; although, if they did apply, they were equally likely to receive compensation as individuals with NOA.

Table 2 shows that individuals with WAA were equally likely to no longer be exposed to the substance causing the problem as individuals with NOA. However, individuals with work-related NOA were more likely to have been fired or left this employment. Those with WAA were significantly more likely to still work in the company, with changes made that likely reduced exposure.

Table 2 Cessation of exposure to suspected agent

| | WAA n=210 | NOA n=891 |
|--|--------------|--------------|
| No longer exposed | 73% | 71% |
| Reason why no longer exposed: | | |
| Left company: | | |
| Quit on MD advice, workers' comp, disability, sick leave | 23%* | 47% |
| Fired | 10% | 24% |
| Left work on own concern | 2%** | 7% |
| Left company, no reason | 4% | 8% |
| Left company, no reason | 6% | 8% |
| Still work in company: | | |
| Reassigned in company | 37%** | 28% |
| New chemical in use, new ventilation or new respirator | 14% | 19% |
| New chemical in use, new ventilation or new respirator | 24%* | 8% |

*p<0.01 by chi-square

**p<0.05 by chi-square

For patients with WAA, the consequences of remaining exposed to workplace triggers can be serious, resulting not only in deteriorating health but, in some cases, loss of employment. It is crucial to work with patients to identify workplace triggers and steps that can be taken to reduce exposures. The optimal solution is to eliminate the hazard (trigger) at its source by substituting a safer product or process. If this is not possible, the next best solution is ventilation or isolation of the work process generating the trigger. If these are not feasible, moving the sensitive person to another area will help, but leaves the hazard unabated. Providing respiratory protection is a last resort, and must be implemented in the context of a respiratory protection program. Reporting cases of WAA helps OHSP focus attention on the need to control asthma triggers in the workplace.

Work-Related Asthma Cases Reported to Massachusetts SENSOR

| December 2005 | January 2006 | February 2006 | Total (3/92 – 2/06) |
|---------------|--------------|---------------|---------------------|
| 5* | 0 | 0 | 1036 |

* Three cases reported in November were inadvertently omitted from the last Bulletin. They are added to December's total.

³ Goe SK, Henneberger PK, Reilly MJ et al. A descriptive study of work aggravated asthma. *Occup Environ Med* 2004;61:512-7.

Remember, work-related asthma cases may be reported to SENSOR by phone, fax, or mail!