NEW JERSEY DEPARTMENT of HEALTH and SENIOR SERVICES

Occupational Health Surveillance Update

SPECIAL ISSUE ON WORK-RELATED ASTHMA

Jon S. Corzine
Governor

Fred M. Jacobs, M.D., J.D.
Commissioner

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Division of Epidemiology, Environmental and Occupational Health

New Jersey's Work-Related Asthma Surveillance Project is Extended Another Five Years

In October 2005, the New Jersey Department of Health & Senior Services (DHSS) was one of three state health departments awarded funding by the National Institute for Occupational Safety and Health (NIOSH) to continue surveillance activities for work-related asthma.

Why work-related asthma? Work-related asthma (WRA) has emerged as the most commonly reported occupational lung disease.[1-2] Direct and indirect costs attributable to WRA in the U.S. have been estimated at $1.6 billion annually.[3] WRA is a serious public health concern in New Jersey, with its extensive industrial base, large workforce, and growing service industry. According to the New Jersey Department of Labor and Workforce Development's Industry and Occupational Employment Projections for 2002-2012, employment growth is expected to

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A toolmaker operates a grinder to form and sharpen a tungsten carbide cutting tool at a manufacturing facility where a case of work-related asthma was identified.

Inside . . .

Work-Related Asthma — Turning Diagnosis into Prevention

Many physicians have asked "why is my reporting of work-related asthma important?" Work-related asthma (WRA) is preventable, and physicians play a crucial role in prevention. The majority of individuals who develop WRA fail to fully recover, even after several years without exposure. A number of studies have shown that between 50-60% of workers are still symptomatic three to four years after exposure has ended.[1-3] Identifying cases promptly is critical to stopping exposure and significantly improving the chance for recovery. It is important for all clinicians to be aware that the development of WRA has long-term adverse health and economic consequences, for workers often affecting future employment. The mean age of the employees identified by our WRA surveillance system is 23 years of age

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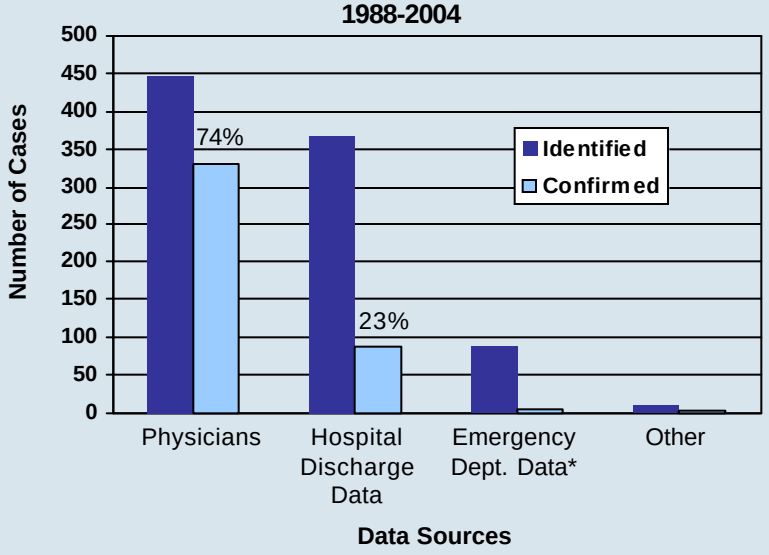
Physician and Nurse Outreach Advisory Board

Since the inception of the Work-Related Asthma (WRA) surveillance project, the Occupational Health Surveillance Program in the New Jersey Department of Health and Senior Services (DHSS) has evaluated and used several data sources to identify cases of WRA. These sources include reports from physicians and advanced practice nurses, hospital discharge data, death certificate registry, and, more recently, emergency department data. To date, physicians who are required by law (N.J.A.C. 8:57-3.2) to report remain the most productive source for confirmed cases of WRA. Figure 1 shows the proportion of identified cases versus those confirmed to date for each of the main data sources. For example, 74% of the cases reported by physicians were confirmed as work-relatd asthma versus 23% of the cases identified through hospital discharge data. The same has been observed in data from other states conducting surveillance of work-related asthma. However, underrecognition and underreporting by physicians is a major weakness in the surveillance of WRA.

FIGURE 1
Work-related Asthma Registry - New Jersey
Identified vs. Confirmed Cases
1988-2004



*data available for year 2004 only

To address the issue of underreporting and underrecognition of WRA, the DHSS partnered with the University of Medicine and Dentistry of New Jersey, Environmental and Occupational Health Sciences Institute. The purpose of this partnership is to develop strategies for improving physician recognition, diagnosis, and reporting of WRA. A Physician and Nurse Outreach Advisory Board (PNOAB) was established in 2003 to carry out the goal and objectives of the partnership (see page 3 for list of members). The goal of the PNOAB is to develop, conduct, and evaluate outreach and education aimed at increasing work-related asthma recognition, case reporting, and medical surveillance by physicians and advanced practice nurses.

To date, PNOAB members and DHSS have accomplished the following tasks:

- Development of educational materials for patients and health care providers, including:
  - > guidelines for physicians and advanced practice nurses on how to recognize, diagnose, and report WRA cases;
  - > informational brochures for patients to promote awareness of work-related asthma;
  - > fact sheets and office poster summarizing reporting guidelines and instructions; and
  - > slide presentations for use at professional meetings.
- Development of a protocol for providing feedback to physicians and advanced practice nurses who submit case reports to the DHSS;
- Identification of target groups to conduct outreach, including newly licensed physicians and other health professionals;
- Collection of information on professional society and association meetings;
- Presentations in grand rounds at hospitals and at professional meetings; and
- Retention of the services of an occupational medicine resident to assist in the processing and classification of cases of WRA.

During the remaining federal grant period, PNOAB members will continue to participate in outreach and education of target groups. These groups include allergists, pulmonologists, occupational medicine specialists, advanced practice nurses, physician assistants, and family practitioners. PNOAB members will also assist in the evaluation component of this outreach and education effort.□

New Jersey Department of Health and Senior Services
Physician and Nurse Outreach Advisory Board

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Fatal Work-Related Asthma

A 38-year-old white male worked for eight years in a facility in New Jersey which milled shark cartilage into a fine powder. Shark cartilage was a popular homeopathic remedy for a number of ailments, including arthritis, cancer, and, ironically, asthma. Over the course of 17 months, he visited both the company's doctor and his personal physician complaining of breathing problems, and was provided asthma medications. During this time, he also went to the local hospital's emergency department three times complaining of asthma symptoms that he attributed to exposure to shark cartilage dust. One week after his last visit to the emergency department, he experienced shortness of breath at work. As he prepared to go home, he collapsed in the company men's room and never regained consciousness. An autopsy showed that the cause of his death was the result of an "acute asthma attack."

Although fatal asthma is uncommon, it is well recognized. Mortality associated with asthma has been increasing since the 1970's, but may have improved in recent years. Much less is known, however, about the mortality associated with work-related asthma (WRA). WRA is the most common work-related respiratory disease in developed countries. WRA has been sub-classified into work-aggravated asthma, which is characterized by exacerbation of pre-existing asthma at work; irritant-induced asthma, (also known as RADS, or reactive airways dysfunction syndrome); and sensitizer-induced occupational asthma. Occupational asthma is often associated with a latency period of months to years between first exposure to an agent and development of immunologic sensitization and asthma. Prognosis is better among workers with shorter durations of exposure after symptom onset, suggesting that early removal from exposure can mitigate WRA. Failure to implement exposure controls can lead to irreversible asthma, or even death.

Early identification and prevention of exposure to environmental agents causing asthma is of critical importance. Identification of sentinel cases serves to trigger preventative measures that might include substitution of non-asthmagenic

TABLE 1
Fatal Cases of Work-Related Asthma (WRA) Reported in the Literature and New Jersey Cases Associated with the Causative Agents

Age	Causative Agent	Occupation/ Workplace	Tenure at Work (yrs)	Time from WRA Symptoms Onset to Death (yrs)	Reference	No. of New Jersey WRA Cases Associated with Agent
52	Gum arabic	Printing	20	12	Groetschel	1
26	Bicycloheptadiene dibromide	Pharmacology laboratory	>3	3	Murray	0
26	Bicycloheptadiene dibromide	Pharmacology laboratory	>2	2	Murray	0
45	Papain powder	Laboratory	3.5	2	Flindt	6
NA*	Green coffee dust	Food processing	NA	NA	NIOSH	0
40's	Isocyanates	Truck bed liners	NA	10**	Rosenman	10
43	Toluene diisocyanate (TDI)	Autobody painting	>20	6	Fabbri	7
34	Diphenylmethane diisocyanate (MDI)	Steel foundry	>6	6	Carino	6
42	Flour	Bakery	20	5	Ehrlich	7
38	Shark cartilage	Milling	8	0.5	Ortega	1
75	Alkaline cleaner	Farming	NA	NA	Rosenman	0

*Information not available
**Victim had asthma for 10 years, not known if WRA

materials, elimination of exposure by removal, and control of exposure by engineering methods and personal protective equipment.

Fatal WRA has been documented in the literature. Table 1 lists the reported fatal cases of WRA, including the causative agent. The agents that cause WRA are wide-ranging, and can be found in many industries in New Jersey. Table 1 also lists the number of WRA cases identified in New Jersey since 1985 for each of these potentially fatal asthmagens.

Case Summaries

In addition to the case described at the beginning of the article, the following are summaries of the available information for the cases listed in Table 1.

1. Gum arabic

A 26-year-old printer died from bronchial asthma after working with wet sprays used in the lithographic printing process.

2. Bicycloheptadiene dibromide

Two 26-year old workers in the pharmacology industry died from toxic exposure to brominated alkylating agents.

3. Papain powder

Exposure to papain powder, used in the food processing industry, caused a fatal asthma attack in a 45-year old laboratory worker.

4. Green coffee dust

A worker died from exposure to green coffee dust, a known asthmagen, in the food processing industry.

5. Isocyanates (3 cases)

Case #1 - A 37-year-old male, self-employed car painter was admitted to the hospital with asthma symptoms. These symptoms had first developed 5 years earlier and were thought to be related to his occupation. He had been working in the same environment for more than 20 years. The car painter was diagnosed with occupational asthma induced by isocyanates, and was advised to change his job or avoid the use of polyurethane paints. He nevertheless continued to work as a car painter and used medications such as bronchodilators, cromolyn, and steroids to treat his asthma. Six years later, he died after developing severe asthma.

Case #2 - A maintenance worker became ill after repairing an MDI foaming system at a factory that manufactured artificial plants with polyurethane foam bases. The worker later suffered recurrent asthma symptoms.

After showing further respiratory symptoms associated with isocyanate exposure, the worker quit his job but continued to experience coughing and progressive loss of lung function. Ultimately, he died.

Case #3 - A man in his mid-forties, who was reported to have had asthma for 10 years, developed an acute asthmatic attack at work. The asthma attack occurred after installing a spray-on bed liner in a van. He began gasping for breath on his knees outside of the building. He was taken immediately to an urgent care clinic. A nurse at the clinic began CPR. An ambulance arrived nine minutes later. Despite attempted resuscitation and transport to a nearby hospital, he was pronounced dead 46 minutes later. The medical examiner's impression was "Asthmatic reaction due to inhalation of chemicals."

6. Flour

A 42-year old baker with severe flour hypersensitivity, refused advice to give up his job, had exacerbations of his asthma, and was found dead after returning home from work wheezing.

7. Alkaline cleaner

A 75-year old female farmer was cleaning a bulk milk tank and had used an alkaline cleaner. She rinsed the tank with an acid rinse. The alkaline cleaner was still present in sufficient quantity in the tank that when the acid rinse was added, a toxic gas was produced and emitted from the tank. The gas caused her to have an acute asthma attack. Despite emergency treatment, she died from the asthma attack in the hospital.

8. Shark cartilage

See case summary at beginning of this article. □

This article was adapted from: Ortega H, Kreiss K, Schill DP, Weissman DN. 2002. Fatal asthma from powdering shark cartilage and review of fatal occupational asthma literature. *Am J Ind Med* 42:50-54.

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Industrial Hygiene Intervention - The Final Link Between Surveillance and Prevention

Surveillance for work-related lung diseases is conducted by the Occupational Health Surveillance (OHS) Program according to the Sentinel Event Notification Systems for Occupational Risk (SENSOR) model. This model, which was developed by NIOSH (National Institute for Occupational Safety and Health) and States with NIOSH-funded surveillance programs for work-related health conditions, has the following components: a reporting source (e.g., health care provider, health data set), a surveillance center (i.e., the OHS Program), and an intervention team. Intervention is conducted at the employer level by means of educational outreoperations, and installing general and local ventilation systems.ach and on-site industrial hygiene evaluations of identified workplaces. The goal of intervention is to improve the work environment for the workers identified with the disease under surveillance, as well as their co-workers, by controlling exposures to agents and conditions that are associated with the development or aggravation of the work-related disease under surveillance.

In the minds of many people, the job of an industrial hygienist is most often associated with the collection of air samples for potentially harmful substances, the results of which are compared to established exposure limits to determine if the exposure levels are excessive and in need of control. The employer must be alert for adverse health effects occuring in workers from exposures below these limits and from other routes of exposure such as dermal absorption. This is especially true in a workplace where a worker experiences aggravation of their existing asthma or develops new-onset work-related asthma (WRA). Many of the agents that cause WRA are sensitizers and are capable of causing symptoms of asthma at levels below established exposure limits. Exposure limits are rarely set on this basis.

WRA occurs in workers employed in a wide variety of industries. Examples of workplaces where various asthmagens (asthma-causing agents were identified during OHS industrial hygiene evaluations are featured in Figure 1 (page 7). Prior to the on-site walkthrough, the industrial hygienist researches the company, their processes and operations, and the substances that are used at the facility. When an OHS industrial hygienist arrives at a workplace to conduct an evaluation, he or she begins by sitting down with the employer representative (usually the facility manager) and explaining the reason for the visit, which is that a case of WRA in an employee or former employee was identified through the OHS Program surveillance system. The industrial hygienist explains how the industrial hygiene intervention will help the employer to identify and correct any conditions or sources of exposure that may result in asthma symptoms in workers. The background and goals of the surveillance system is described and information is obtained from the employer on the processes and materials used at the workplace. During the walkthrough of the workplace, the industrial hygienist looks for operations and processes that may cause worker exposures to chemicals, dusts, or conditions that trigger asthma. The industrial hygienist primarily uses observation and questioning to assess exposure conditions. Special instruments may also be used to evaluate the performance of ventilation systems or measure levels of airborne contaminants.

An OHS Program industrial hygienist measures the performance of a ventilation system using an air-flow meter.

Industrial hygienists recognize that engineering, work practices, and administrative controls are the primary means of reducing employee exposure to occupational hazards.[1] Engineering controls minimize employee exposure by either reducing or removing the hazard at the source or isolating the worker from the hazards. Engineering controls include eliminating toxic chemicals and

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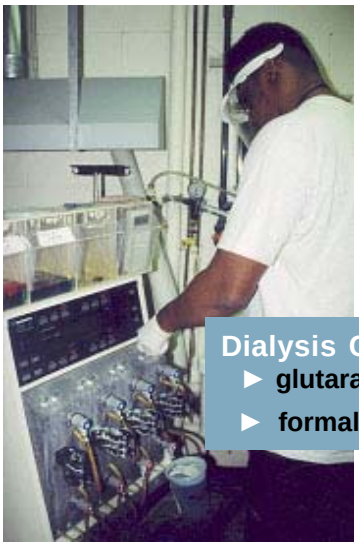
FIGURE 1
Examples of Workplaces and Asthmagens Identified During Industrial Hygiene Evaluations



Dialysis Center
- ► glutaraldehyde
- ► formaldehyde

Machine Shop
- ► machine fluids
- ► oil mist
- ► tungsten carbide

Dental Laboratory
- ► methyl methacrylate
- ► glutaraldehyde
- ► quarternary ammonium products

Soldering Electronics
- ► solder flux fume (colophony)

Insect Rearing Laboratory
- ► insect frass

Cosmetics Manufacturer
- ► carmine red

INDUSTRIAL HYGIENE
Continued from page 6

replacing harmful toxic materials with less hazardous ones, enclosing work processes or confining work operations, and installing general and local ventilation systems.

Work practice controls alter the manner in which a task is performed. Some fundamental and easily implemented work practice controls include following proper procedures that minimize exposures while operating production and control equipment. Administrative controls include controlling employees' exposure by scheduling production and workers' tasks, or both, in ways that minimize exposure levels. For example, the employer might reassign a sensitized worker to a job with minimal chance of exposure.

When effective work practices and/or engineering controls are not feasible to achieve the desired reduction in exposure, or while such controls are being instituted, and in emergencies, appropriate respiratory protective equipment must be used. In addition, personal protective equipment such as gloves and protective clothing may also be required. To be effective, personal protective equipment must be individually selected, properly fitted and periodically refitted, conscientiously and properly worn, regularly maintained, and replaced as necessary.

OHS Program industrial hygienists are also available to provide telephone consultations to employers, employees, and health care providers. The ultimate goal of industrial hygiene intervention is to improve working conditions for workers in New Jersey.□

Reference

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Development of Work-Related Asthma From Skin Exposure

ABSTRACT

The risk of developing work-related asthma is a dose-related response. However, on many occasions follow-up to the workplace of a patient with work-related asthma has not found elevated or even any measurable air levels of the suspected workplace allergen. In some cases, the history will reveal changes in production between the onset of asthma and the inspection. In other cases, a history of spills is elicited. Studies have found a dose-response relationship between the number of spills and disease. Air levels will be low or unmeasurable on the day of inspection since no spill is taking place that day. Proper spill clean-up procedures, appropriate personal protective equipment and preventive maintenance can protect workers from exposure during spills. In some situations where air levels are unmeasurable, there is also no history of spills or production changes.

The literature on the development of respiratory sensitization after skin exposure without respiratory exposure may explain how a patient has had sufficient exposure to develop asthma. It is difficult in humans to isolate the source of exposure (i.e., someone with skin exposure typically also has respiratory exposure). Animal models have been used where the rodents' skin has been exposed via subcutaneous injection or an occluded patch without respiratory exposure. Respiratory sensitization has been demonstrated via skin exposure for latex, toluene diisocyanate (TDI) hexadimethyl isocyanate (HDI), diphenylmethane diisocyanate (MDI), trimellitic anhydride (TMA) and 3-amino-5-mercapto-1,2,4-triazol (AMT). Further work with HDI has shown that HDI used in auto paints conjugates with keratins in the skin. Isolating skin exposure in studies of humans has not proven possible. A study was performed which used MDI. However, the authors could not rule out that there was increased inhalation exposure in workers with increased skin stains.

The possibility of dermal exposure initiating or aggravating work-related asthma complicates both the prevention and management of work-related asthma. Dermal exposure should be considered as a possible route of exposure for the isocyanates, latex, and possibly other exposures, particularly when air levels are low or non-measurable.□

Abstract published with permission from the author, Kenneth D. Rosenman, M.D., Michigan State University (MSU), Department of Medicine. For a copy of the full article, please access the MSU Web site at http: //oem.msu.edu/news/Sv16n2.pdf.

How to Submit a Case Report of Work-Related Asthma?

Download a reporting form in PDF or *Microsoft* Word format at www.nj.gov/health/eoh/survweb/wra or call the Occupational Health Surveillance Program at 1-800-772-0062. Submit completed forms:

By fax: (609) 292-5677

or

By mail:

New Jersey Department of Health & Senior Services
Occupational Health Surveillance Program
H& A Building, Rm 701
PO Box 360
Trenton NJ 08625-0360

Thank you!

Industries and Asthmagens Associated with Work-Related Asthma

Occupational Health Service
Occupational Health Surveillance Program

Listed below are industries where work-related asthma has been identified, and the asthmagens (asthma-causing agents) associated with each. The list includes agents that are sensitizers known to cause allergic asthma, as well as irritants known to be responsible for inducing reactive airways dysfunction syndrome (RADS). Additional information on industries and occupations, and associated asthmagens can be found through sources listed at the end of the table. Additional copies of this list can be requested using the order form on page 23 or it can be downloaded from the DHSS Work-related Asthma Web site at *www.nj.gov/health/eoh/survweb/wra.*

Industry	Asthmagen
Adhesives industry	acid anhydrides, aliphatic amines, polycyclic compounds, colophony, diisocyanates, methyl methacrylate, cyanoacrylates
Agriculture	insect proteins, pollens, aromatic herbs, livestock, organophosphorous insecticides, soya, chloramides, sulfones, mites
Aircraft filter manufacturing	triethylenetetramine
Aluminum cable soldering	aminoethylethanolamine
Aluminum industry	aluminium salts, fluorides
Animal handling and processing	animal urine/dander, feathers, avian proteins, penicillins, cephalosporins, cereal seeds, macrolids, oilseed
Artificial fingernail application	methyl methacrylate, cyanoacrylates
Autobody repair	diisocyanates, acrylates, styrene
Automobile painting	diisocyanates
Baking	enzymes, flour/grain dust, grain mites, insect proteins, cereal seeds, powdered chicken egg
Bath enameling	acid fumes
Boat manufacturing	styrene, diisocyanates, wood dust
Boiler/gas turbine cleaning	vanadium
Candy manufacturing	vegetable gums
Carpentry	wood dust, formaldehyde, diisocyanates, epoxy resins
Cement manufacturing	potassium dichromate
Ceramic industry	chromium salts, nickel salts
Chemical industry	acid anhydrides, formaldehyde, diisocyanates, methyl methacrylate, cyanoacrylates, sulphites, persulphates, piperazine, platinum salts, quaternary ammonium compounds, coloring reagents, n-methylmorpholine, isothiazolinones

Industry	Asthmagen
Chrome plating	sodium bichromate, chromic acid, potassium chromate
Coffee processing	green coffee beans
Condom manufacturing	latex, lycopodium powder
Cooking	garlic dust, spices, aromatic herbs, papain
Cosmetics manufacturing	aliphatic amines, polycyclic compounds, cochineal dust, carmine red, enzymes, formaldehyde, vegetable gums, lycopodium powder, vanillin, quaternary ammonium compounds
Custodial services	cleaning agents, latex, mold, dust, bird/bat droppings, quaternary ammonium compounds
Dairy industry	animal urine/dander, lactoserum, casein, enzymes
Dentistry	latex, methyl methacrylate, cyanoacrylates, epoxy, diisocyanates, formaldehyde, glutaraldehyde, quarternary ammonium compounds
Detergent manufacturing	subtilsins (*Bacillus subtilis*), esperase, enzymes
Diamond industry	metal carbides, cobalt, nickel
Dye manufacturing and dyeing	levafix brilliant yellow, drimarene brilliant yellow and blue, cibachrome brilliant scarlet, aromatic amines and their derivatives, acid anhydrides, cochineal, carmine red, coloring reagents, sulphites, persulphates
Electronics	solder flux fume, colophony, aliphatic amines, polycyclic compounds, acid anhydrides, zinc chloride, ammonium chloride
Entomology	insect proteins
Enzyme manufacturing	fungal alpha-amylase, enzymes
Epoxy resin manufacturing	acid anhydrides
Explosives manufacturing	vegetable gums, tetrazene, freon, lycopodium powder
Firefighting	combustion products of plastics
Floral industry	pollens, house plants, dried flowers
Food industry	garlic dust, spices, aromatic herbs, insect proteins, arthropods, shellfish, cochineal, carmine red, enzymes, vegetable gums, oil seeds, dust mites, maiko dust, seafood, powdered chicken egg, sulphites, persulphates, soya, vanillin, tea dust, casein, flours, papain, castor beans, herbal tea, chicory, vegetable oil mist
Food packaging	combustion products of polyvinyl chloride
Forensics	ninhydrin
Foundry	formaldehyde, derivatives of furan, diisocyanates
Fur dyeing	para-phenylenediamine
Galvanizing	zinc fume
Grain handling and processing	grain dust, grain mites, molds
Gum manufacturing	vegetable gums

Industry	Asthmagen
Hairdressing	henna, sulphites, persulphates, ethanolamine, formaldehyde, sericin
Health care	glutaraldehyde, latex, formaldehyde, methyl methacrylate, cyanoacrylates, quaternary ammonium compounds, methyldopa, penicillins, psyllium, hexachlorophene, chlorhexidine
Insect breeding	insect proteins, arthropods
Jewelry polishing	cuttlefish bone dust, ivory dust
Laundry	enzymes, sulphites, persulphates
Machine shop	tungsten carbide, cobalt, nickel, oil mist, coolants, ethanolamines
Meat wrapping	polyvinyl chloride fume
Metallurgy	aliphatic amines, polycyclic compounds, metal carbides, cobalt, nickel, derivatives of furan, diisocyanates, chromium salts, nickel salts, platinum salts, palladium salts, acid fumes, aluminum salts, fluorides
Mining	bioaerosols, styrene, polyester resins
Mortuary science	formaldehyde, glutaraldehyde
Mushroom cultivation and processing	mushroom spores
Nickel plating	nickel sulphate
Office work	bioaerosols, cleaning agents
Oyster farming	hoya
Paint spraying	dimethylethanolamine, diisocyanates, zinc chromate
Paper/pulp manufacturing	wood dust, formaldehyde, sulphites, persulphates, acid fumes, quaternary ammonium compounds, proteolytic enzymes, chlorine, diazonium salts
Pea processing	mexican bean weevils
Pharmaceutical industry	aliphatic amines, polycyclic compounds, aromatic amines and derivatives, acid anhydrides, penicillins, cephalosporins, cochineal dust, carmine red, enzymes, vegetable gums, lycopodium powder, macrolids, sulphites, persulphates, volatile acid chlorides, piperazine, psyllium, chloramides, sulfones, tetracyclines, cynorohodon, hydralazine, rose hips, trypsin, bromelin, papain, pepsin, ipecacuanha dust, morphone, pancreatin, isoniazid, spiramycin, cimetidine, acetic acid, phenylglycine
Pharmacy	gentian powder, flaviastase
Phenolic resin manufacturing	formaldehyde
Photographic processing	aliphatic amines, polycyclic compounds, coloring reagents, chromium salts, glutaraldehyde
Plastics manufacturing	aliphatic amines, polycyclic compounds, acid anhydrides, diazonium salts, formaldehyde, methyl methacrylate, diisocyanates, trypsin, bromelin, polyvinyl chloride (fume & dust), azodicarbonamide, styrene, polypropylene fume, dioctyl phthalate
Platinum refining	chloroplatinic acid, ammonium hexachloroplatinate, soluble platinum salts
Polyurethane foam manufacturing	toluene diisocyanate, diphenylmethane diisocyanate, 4-methylmorpholine

Industry	Asthmagen
Polyurethane foam spraying	diisocyanates
Poultry processing	chicken dander and feathers, amprolium hydrochloride
Prawn/crab processing	prawns, crabs
Printing/lithography	vegetable gums
Refuse collection processing	bioaerosols
Rubber industry	aliphatic amines, polycyclic compounds, aromatic amines and derivatives, diazonium salts, formaldehyde
Seafood industry	shellfish
Silkworm culturing	silkworms, sericin
Soldering	solder flux fume, colophony, polyether alcohol, polypropylene glycol
Steel industry	vanadium
Surgical glove manufacturing	latex
Tanning	aliphatic amines, polycyclic compounds, coloring reagents, enzymes, formaldehyde, chromium salts, sulphites, persulphates, casein
Tea processing	tea dust
Teaching	cleaning agents, mold, dusts
Textile industry	cochineal dust, carmine red, coloring reagents enzymes, vegetable gums, chromium salts, sericin, natural fibers, latex
Tobacco farming and processing	tobacco leaf, tobacco dust
Tungsten carbide tool manufacturing/grinding	cobalt, nickel
Venipuncture	bis (tri-n-butyltin) oxide
Veterinary medicine	animal proteins, urine/dander, penicillins, cephalosporins, macrolids, piperazine
Water treatment industry	chloramides, sulfones, chloramine-T
Welding	chromium salts, nickel, chromium, vanadium, zinc chloride, ammonium chloride
Winery	mites, organophosphorous insecticides
Woodworking	wood dust, ramin
Wool processing	wool
X-ray processing	glutaraldehyde

SOURCES:

- Asmanet Web site: www.remcomp.fr/asmanet/asmapro/asmawork.htm
- Association of Occupational and Environmental Clinics: www.aoec.org/aoeccode.htm
- Bernstein IL, Chan-Yeung M, Malo J-L, Bernstein DI, eds. Asthma in the Workplace. Marcel Dekker Inc., New York, 1999.
- Canadian Centre for Occupational Health and Safety: www.ccohs.ca/oshanswers/diseases/asthma.html
- National Institute of Health: http://hazmap.nlm.nih.gov/cgi-bin/hazmap_generic?tbl=TblDiseases&id=23

Myths About Work-Related Asthma

MYTH: "The worker was predisposed to asthma - anyone could see that from his history of childhood allergies."

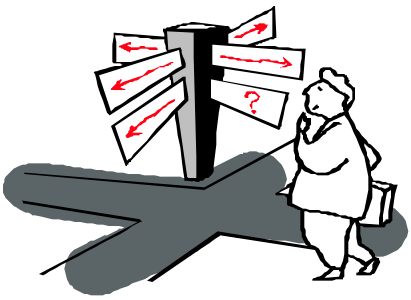
FACT: Most patients with work-related asthma do not have a history of allergies. This is especially true for asthma caused by exposure to low molecular weight chemicals such as formaldehyde and diisocyanates. These chemicals are a common cause of work-related asthma in New Jersey workers. However, workers who have a history of allergies are at an increased risk of developing work-related asthma from sensitizers such as animal dander in labs, flour in bakeries, or platinum in platinum refineries.

MYTH: "A company report shows they've done air testing. All those tests came in below the OSHA limits. So, it must not be work-related asthma."

FACT: Most OSHA workplace exposure limits have not been developed to protect against work-related asthma. Many workers with breathing symptoms work in companies that meet OSHA standards or work with substances not regulated by OSHA.

MYTH: "A proper preplacement screening would prevent people from being hired in workplaces where they will develop work-related asthma."

FACT: No combination of pre-placement testing (such as a medical history, skin testing, or specialized breathing tests called methacholine challenge testing) has been able to adequately predict who will develop work-related asthma. And, because of the way this testing is designed, it would exclude large numbers of



people from working with substances that could cause work-related asthma, even though these people would never actually develop work-related asthma.

MYTH: "Workers with asthma should just transfer to a different job in their company, or find another job somewhere else. That would take care of the problem."

FACT: People who have developed with work-related asthma often continue has had no breathing problems even after exposure to the substances in their jobs have been reduced or they are no longer exposed to the substance. The longer a person with work-related asthma continues to be exposed to the substance, the more likely their symptoms will not resolve even if they are no longer exposed.

MYTH: "How could she develop work-related asthma now? She's been working at that company for over ten years!"

FACT: Work-related asthma, by definition, develops after a period of time of exposure where the person has had no breathing problems. The period of time when no symptoms are present can range from months to more than 20 years. The beginning of work-related asthma may occur as a result of a change in the job, changes in the level of exposure to an allergen, spills, or other high level exposures.

MYTH: "His symptoms are happening at night, not at work, so, it can't be work-related."

FACT: Some people with work-related asthma do not have breathing problems at work, but their symptoms start at night, 8-12 hours after exposure. In this case, the only way to find out if the breathing problems are work-related may be to see if the person's breathing problems get better when they are away from work for at least two weeks.

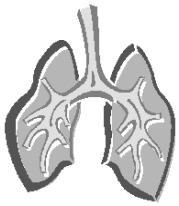
MYTH: "I know doctors are required by New Jersey law to report patients with work-related asthma. But the patient's employer will fire him if the company is inspected because of his work-related asthma."

FACT: Industrial hygiene workplace evaluations are conducted after talking with the patient. If a workplace evaluation is conducted, the patient's name and job are kept confidential. Also, OSHA laws protect against this type of discrimination.

MYTH: "It's their cigarette smoking habits that caused their work-related asthma."

FACT: Smoking does not increase the risk of getting work-related asthma. Some studies have found increased levels of antibodies (Serum IgE), or shorter time to the development of asthma, in smokers. Among the patients reported to the New Jersey work-related asthma registry, only 8% were known to be current smokers.□

Adapted with permission from *Myths About Work-Related Asthma*, Asthma Initiative of Michigan, www.getasthmahelp.org.



Work-Related Asthma

Examples of Case Reports

Mechanic

A 42-yr-old mechanic with a history of asthma took a new job at a bowling alley to clean and maintain the machinery. After one year on the job he noticed that his asthma symptoms would worsen when he worked with the various kinds of cleaning oils and he had to increase the amount of his asthma medication use. He tried to substitute other kinds of substances to clean the machines but eventually had to quit his position. He still works at the bowling alley. He is now asymptomatic and gets asthma symptoms once in a while.

Office Worker

A 39-yr-old office worker noted frequent upper respiratory distress during the first few years of working in a building used both as an office and a warehouse for various soap and consumer products. Other employees also complained about the indoor air quality. Approximately seven years later, a physician diagnosed her with asthma caused by her exposure to soap dust. She was moved to another building where she experienced no respiratory complaints. She reported asthma symptoms whenever her duties forced her to return to the original building or experienced slight tightness in the chest when she used laundry detergent or dishwashing detergent at home.

Chemical Operator

This 52-year-old man, with no prior history of illness, worked at a precious metals reclaiming plant for over 12 years as a kettle operator and stock person. He wore personal protective equipment, including a full-face respirator at all times. He began experiencing symptoms of reactive airways dysfunction syndrome and was evaluated by the company physician. Methacholine challenge and skin tests for platinum salts were positive.

Dough Mixer

A 52-year-old old man worked as a foreman dough mixer for 10 years at a plant that manufactured pizzas for distribution at supermarkets. He started having breathing problems approximately five years after beginning his job. His work environment, particularly the dough mixing area, was extremely dusty because of the flours used to make the pizzas. His physician prescribed asthma medications as he continued working and having symptoms. He and his coworkers requested a workplace evaluation of the plant that resulted in minimizing their exposure to flour dust.

Stockperson

A 45-year-old woman arrived via ambulance from work at a local emergency department because she could not breathe on her own. She was complaining of shortness of breath for approximately one day prior to her admission. This employee worked in the bulk room where tea powder was packed and shipped. Because the tea powder is very fine and has a strong smell, employees wore respirators. Yet, this worker routinely suffered from sore throat, eye irritation, fatigue, and breathing difficulty. The company physician referred her to a lung specialist who diagnosed her with asthma because of exposure to tea dust. She eventually quit her job.

Receptionist

A 37-year-old receptionist in a hospital emergency department began having breathing problems when the housekeeping staff started using a floor wax stripper. Although the hospital management disagreed that the cleaning product caused her illness, the patient has been treated at the hospital several times because of her breathing problems. She was diagnosed with asthma and was still taking medications four years later.

Using EDD for Surveillance of Work-Related Asthma - Preliminary Findings

The importance of public health surveillance and the potential of Emergency Department Data (EDD) to improve case ascertainment in surveillance have been well-documented.[1-2] However, few state systems utilize information on ED visits for the purpose of monitoring trends in workplace illnesses and injuries to develop public health interventions. The 5,200 EDs in the U.S. are well-positioned to provide useful data for public health surveillance of injuries and illnesses due to the volume of patients they treat and the types of cases presenting in EDs.

In 2004, an amendment to the NJ Hospital Reporting of Uniform Bill Data expanded hospital reporting requirements to include all patients treated in EDs. EDD are expected to improve and expand our surveillance system by identifying non-hospitalized cases of occupational injuries and diseases, including work-related asthma (WRA), that would not be captured by physician reports or hospital discharge data (HDD).

The Occupational Health Surveillance Program recently completed a preliminary analysis of 2004 EDD to identify potential cases of WRA and obtain demographic characteristics. Cases were obtained from emergency department visits of patients, aged 16-69, with asthma as a primary diagnosis (ICD-9 493), and either Workers' Compensation listed as primary payer or a variable indicated the incident occurred on the job. Respiratory conditions due to inhalation of chemical fumes and vapors (ICD-9 506) were also explored to assess the yield of WRA cases using this diagnostic category. Logistic regression modeling was also carried out and odds ratios were calculated to estimate the probability of each type of reportable condition presenting in EDD versus HDD. The following summarizes the results:

ICD-9 493: A total of 49 cases were identified. Almost half of the cases were coded as White. The other cases were coded as Black (20%), Hispanic (16%), and Other (14%). Eighty-two percent were between 20 and 50 years old and 76% were women.

ICD-9 506: A total of 81 cases were identified. Forty-six percent of the cases were coded as White, 31% as Black, 12% as Hispanic, and 11% as Other. Sixty-eight percent were between 20 and 50 years old, and the proportion of men and women was approximately equal.

The results of a preliminary analysis exploring the effectiveness of EDD in capturing work-related reportable conditions in New Jersey revealed that EDD could be a more useful source of obtaining WRA cases than HDD, due to the nature of the clinical manifestation and treatment of asthma attacks. Individuals who met the search criteria above were 32 times more likely to present in EDD than in HDD, controlling for age and race/ethnicity. Case follow-up is being carried out to further characterize and confirm these cases for educational and industrial hygiene interventions.□

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1. Thacker SB, Stroup DF. The future of national public health surveillance in the United States. J Public Health Manag Pract. 1996; 2:1-3.
2. Garrison HG, Runyan CW, Tintinalli JE, et al. Emergency department surveillance: an examination of issues and a proposal for a national strategy. Ann. Emerg. Med. 1994; 24: 849-856.

Occupational Health Surveillance Update

A newsletter of the Occupational Health Surveillance Program, Division of Epidemiology, Environmental and Occupational Health, New Jersey Department of Health and Senior Services.

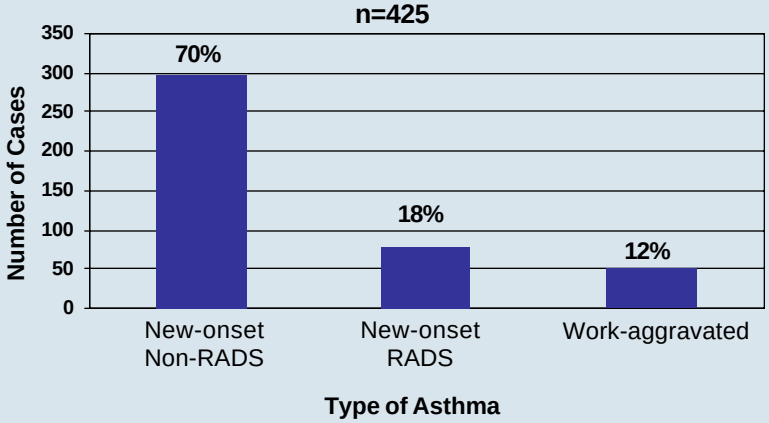
The newsletter is available online at www.nj.gov/health/eoh/survweb. Follow the links to Publications. An electronic copy can be obtained by sending your e-mail address to surveillance@doh.state.nj.us. If you would like to be added to or removed from our mailing list, please send your name and address via e-mail as shown above, or via fax to H. Fontus at (609) 292-5677.

WORK-RELATED ASTHMA
Continued from page 1

continue to occur largely in the service-producing industries. This growth is projected to be led by the health care and social assistance industry sector, adding 129,400 jobs, an increase of 29% within the industries. The educational services industry is projected to grow, as well, adding 19,200 jobs, an increase of 23%, within the industry.[4] These two industry sectors figure prominently among the industries identified with a significant burden of work-related asthma cases, emphasizing the importance of surveillance for disease detection leading to health promotion and disease prevention.

Work-related asthma (WRA) is an increasingly important cause of respiratory impairment and it can persist for years, even after cessation of workplace exposures. Although mortality from asthma is uncommon, several deaths due to asthma (see article on page 4), including one in New Jersey, have been reported when workplace exposures continued to occur. Workplace exposures to dusts, mists, vapors, gases, fumes, or biological agents may aggravate asthma in a worker with pre-existing asthma, or may cause asthma for the first time in a healthy worker. The number of agents that have been shown to cause work-related asthma is large and constantly growing. More than 300 substances have been associated with work-related asthma, affecting workers in a variety of industries and occupations.[5] These substances include latex rubber, grain and floor dust, dust (dander) from animals and insects, molds, chemicals, cleaning materials, and other products. A detailed list of industries and asthmagens associated with WRA is provided as a pull-out section on pages 9-12.

FIGURE 1
Number of Confirmed Work-Related Asthma Cases by Type
New Jersey, 1988-2004
n=425



Currently, the most reliable estimate of the prevalence of WRA in New Jersey is derived from the New Jersey Behavioral Risk Factor Survey (NJBRFS). Estimates from 2003-2004 NJBRFS survey data indicate that, among adults with current asthma in New Jersey, 49,458 (10.7%) cases may be work-related.[6]

Goal and Objectives

The goal of the surveillance program is to prevent WRA in New Jersey workers. The objectives are as follows:

1. Promote the recognition and reporting of WRA by physicians and advanced practice nurses who are required by law to report WRA cases to the DHSS.

2. Identify industries, occupations, and asthma-causing agents that put workers at risk for WRA.

3. Interview workers with WRA to obtain detailed information on risk factors.

4. Conduct worksite investigations to identify causative agents and evaluate workplace practices and conditions, and recommend exposure control measures.

5. Develop and implement prevention strategies through worksite investigation reports, dissemination of educational fact sheets, publication of journal and newsletter articles, and making presentations at local and national meetings.

6. Collaborate with the CDC-National Institute for Occupational Safety and Health, other States involved in WRA surveillance, and organizations in New Jersey to develop and maximize prevention efforts.

7. Share surveillance findings with health care providers, other states conducting WRA surveillance, unions, trade organizations, public health professionals, and others.

The WRA Surveillance System

The components of the New Jersey WRA surveillance project include case ascertainment and follow-up, worksite intervention, summary data analysis, and broad-based prevention activities to be guided by surveillance findings. Currently, sources of case reports include physician and advanced practice nurse reports and hospital discharge and emergency department data.

Reporting Guidelines

New Jersey law (N.J.A.C. 8:57-3.2) requires physicians and advanced practice nurses to report to the

DHSS any diagnosed or suspected case of WRA, including:

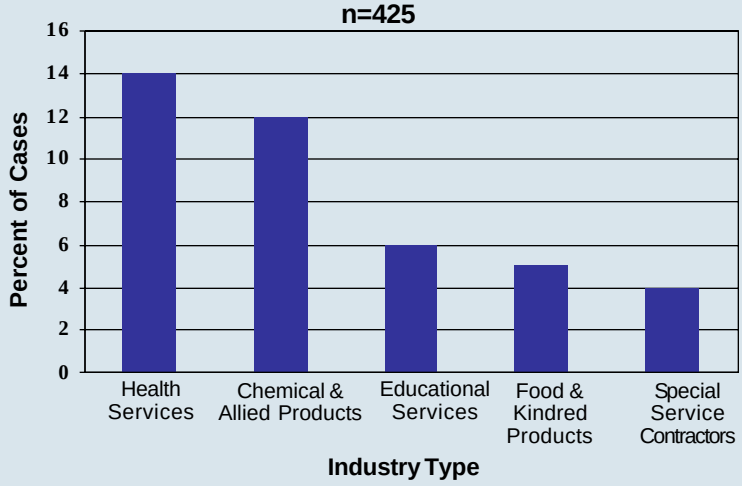
New-onset asthma - asthma resulting from exposure in the workplace to sensitizers or irritants.

Work-aggravated asthma - asthma with a prior history of symptomatic or treated asthma who experience an increase in symptoms and/or an increase in the use of asthma medications within two years of entering a new workplace setting, or from exposure to new chemicals or agents in an existing workplace.

Reactive Airways Dysfunction Syndrome (RADS) - new-onset asthma that develops within 24 hours following a single, high-level exposure to inhaled irritants where the patient continues to be symptomatic for at least three months. Common causes include smoke inhalation and accidental releases of chemical irritants like chlorine and ammonia.

The diagnosis of WRA is confirmed if the following criteria are met: a) there was a physician diagnosis of asthma, and b) there was an association between symptoms of asthma and work.

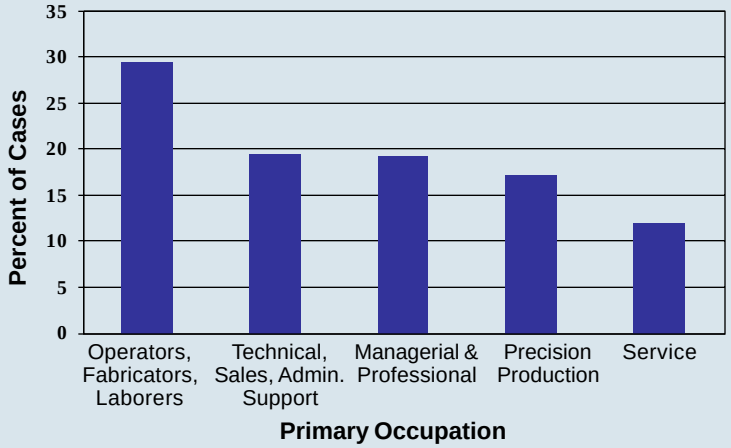
FIGURE 2
Distribution of Work-Related Asthma Cases by Industry Type
New Jersey, 1988-2004
n=425



Surveillance Findings

The New Jersey WRA Surveillance Project identified and confirmed 425 cases of WRA between the years 1988 to 2004. The large discrepancy between prevalence estimates and number of identified cases is attributable to underreporting. The proportion of males versus females was almost equal, 51% and 49%, respectively. Sixty-nine percent of the cases occurred among white non-Hispanics, followed by 16% among black non-Hispanics. Figure 1 shows the number of cases of new-onset non-RADS asthma (70% of reported cases), new-onset RADS (18%), and work-aggravated asthma (12%) identified through the WRA Surveillance Project.

FIGURE 3
Distribution of Work-Related Asthma Cases by Primary Occupation
New Jersey, 1988-2004
n=425



Industry and Occupation

Cases of WRA were identified across all industry types. Figure 2 lists the types of industries in which more than 15 cases of WRA were identified. The largest proportion of cases were in the health services industry (14%) followed by chemical and allied products industry (12%), and educational services (6%).

The occupational categories most frequently identified for cases of WRA are shown in Figure 3. The largest proportion of identified cases (29%) were in the occupations of operators, fabricators, and laborers; followed by technical, sales, and administrative support occupations (19%).

Causative Agents

The most frequently identified causative agents that account for 50% of all confirmed cases of WRA

are shown in Table 1. The two most frequently reported asthma-causing agents associated with the 425 cases were chemicals (not otherwise specified) and indoor air pollutants, with 23 and 22 cases, respectively.

Conclusions and Plans for the Future

Surveillance of WRA has yielded important epidemiologic data about WRA and has led to useful interventions with patients, employers, and health care providers. Surveillance results have been published in the occupational health and medical literature and discussed at local and national public health meetings.

Collaboration continues with various stakeholders including other states with WRA surveillance systems. The DHSS is currently conducting outreach and education activities to increase recognition and reporting of WRA among health care providers. Evaluation of this effort will be conducted to measure its impact on physician reporting.□

TABLE 1
Agents Most Commonly Associated with Confirmed Cases of Work-Related Asthma in New Jersey
n=425

Agent
Chemicals, not otherwise specified
Indoor Air Pollutants
Dust, not otherwise specified
Mold, not otherwise specified
Formaldehyde
Diesel Engine Exhaust
Soluble Halogenated Platinum Compounds
Chlorine
Smoke, not otherwise specifed
Solvents, not otherwise specified
Latex
Toluene Diisocyanate
Hydrochloric Acid
Glutaraldehyde
Paper Dust
Welding Fume, not otherwise specified
Epoxy Resins
Diisocyanates, not otherwise specified
Wood Dust, not otherwise specified
Metal Working Fluids
Cleaning Materials, not otherwise specified
Gasoline Engine Exhaust
Paint Vapors

An industrial hygienist from the Occupational Health Surveillance Program uses a smoke tube to evaluate the performance of the local exhaust ventilation system of a solvent cleaning station at a polyurethane foam manufacturing plant. Two cases of work-related asthma were identified at this workplace.

References

1. Friedman-Jimenez G, Beckett WS, Szeinuk J, Petsonk EL. Clinical evaluation, management, and prevention of work-related asthma. Am J Ind Med 37(1):121–141 (2000).
2. Chan-Yeung M. Assessment of asthma in the workplace. ACCP consensus statement. Am Coll Chest Phys Chest 108(4):1084–1117 (1995).
3 .Leigh JP, Romano PS, Schenker MB, and Kreiss K. Costs of Occupational COPD and Asthma. Chest, 2002;121:264-272.
4. Population, Labor Force, Industry Employment and Occupational Employment Projections for New Jersey 2002 to 2012. New Jersey Department of Labor and Workforce Development, Division of Labor Market and Demographic Research, Trenton, NJ. December 8, 2005.
5. Chan-Yeung M, Occupational Asthma, Chest, 98:5, November 1990 supplement, 148s-161s.
6. New Jersey Behavioral Risk Factor Survey, 2003. New Jersey Department of Health and Senior Services, Center for Health Statistics, Trenton, NJ.

Work-Related Asthma Case Definition

The New Jersey Department of Health & Senior Services (DHSS) encourages healthcare professionals to report not only confirmed, but all suspected, cases of asthma that are caused or exacerbated by work-place exposures or conditions. Reported cases should include asthma caused by sensitizers or irritants in addition to cases of reactive airways dysfunction syndrome (RADS) and pre-existing asthma aggravated at work.

The table below is a quick summary of the decision logic scheme used for case classification of work-related asthma cases. The information contained in the table was developed to enable physicians and other health care professionals to determine what types of clinical cases should be reported to the DHSS. See page 8 for instructions on how to submit a case report. Our occupational health physician, Dr. Barbara Gerwel, is also available for assistance with case classification. Please call 1-800-772-0062, if you have any questions.□

Case Classification	**POSSIBLE** Work-Related Asthma	**PROBABLE** Work-Related Asthma	**CONFIRMED** Work-Related Asthma
Case Definition	**Symptoms of asthma** **AND** **Association between symptoms of asthma and work**	**Diagnosis of asthma** **AND** **Association between symptoms of asthma and work**	**Diagnosis of asthma** **AND** **Objective evidence of work-relatedness**
Case Criteria	**Symptoms of asthma**: episodic cough, wheezing, shortness of breath, chest tightness. **AND** **Patient-reported work-related temporal pattern of symptoms of asthma** Patient may identifiy specific agents, processes or conditions at the workplace where symptoms began, worsened, or had a work-related temporal pattern.	**Diagnosis of asthma symptoms**: Cough, wheezing, shortness of breath, chest tightness, sputum production. **Physical examination**: Wheezing during normal breathing, but many patients with asthma may have no abnormal findings. **Spirometry**: Increase of >12% in FEV1 after bronchodilator, with at least 200 ml absolute increase. Diurnal variability of PEF of >20% also supports diagnosis of WRA. If spirometry results are normal, follow with *non-specific bronchial responsiveness* (NSBR) testing. Abnormal methacoline testing supports diagnosis of WRA. **AND** **Patient-reported work-related temporal pattern of symptoms of asthma**	**Diagnosis of asthma** **AND** **Objective evidence of work-relatedness**: > Pre-Post shift spirometric decline >12% > Monday-Friday spirometric decline >12% > Serial PEF at work and away from work with significant worsening/variability at work > Induced sputum inflammation compared at work and away

News and Issues

Are exposures to cleaning products associated with work-related asthma?

Cleaning products contain a diverse group of chemicals that are used in a wide range of industries and occupations, as well as in the home. Their potential to cause or aggravate asthma has recently been recognized. Some cleaners that have been marketed as a means to control asthma triggers have actually been pulled from the market because they caused or aggravated asthma. Further work is needed to identify the specific agents and how their use causes asthma, in addition to investigating the frequency of adverse respiratory effects among regular users, such as housekeeping staff.

One of our new publications, *Asthma and Cleaning Products - What Workers Need to Know* provides information to workers regarding the hazards of working with cleaners, as well as protective measures. Copies of the brochure can be requested by using the order form on page 23 or it can be downloaded from our Work-related Asthma Web site at www.nj.gov/health/eoh/survweb/wra.

Commissioner Holds Asthma Summit

New Jersey Department of Health and Senior Services (DHSS) Commissioner Fred M. Jacobs, M.D., J.D., challenged New Jersey's 21 Centers for Primary Health Care to join him in reducing asthma disparities that negatively impact the health and economic security of many New Jersey families and communities. Dr. Jacobs, a pulmonologist, issued his challenge at the DHSS' first annual *Asthma Summit* in Princeton, NJ, on September 30, 2005. The Summit was the culminating event of the Commissioner's month-long *Healthy Communities for a Healthy New Jersey* initiative to reduce health disparities in New Jersey. Asthma that is related to work was among the topics discussed.

Commissioner Jacobs came to the DHSS in 2004 with the goal of having a Commissioner's Asthma Summit as a primary tool in reducing the incidence and impact of asthma in New Jersey. Experts and health care professionals from throughout New Jersey and the United States joined the Commissioner in the daylong conference to improve strategies for addressing asthma care throughout the state. New Jersey's Centers for Primary Health Care treat approximately 10,000 patients diagnosed with asthma, with 57.3 percent under the age of 20.

Truck Bed Liner Applicators Warned of the Dangers of Working with Diisocyanates

A 45-year-old manager of a vehicle detailing company died from an acute asthmatic reaction after spraying a diisocyanate-based truck bed liner. The application of polyurethane bed liners has been shown to expose workers to high levels of this hazardous chemical in this growing industry. The Occupational Health Surveillance Program alerted all employers identified in New Jersey as potential users of the spray-on process by developing and mailing them a Health Alert, *Important Information for Applicators of Polyurethane Spray-on Bed Liners*. This *Alert* addresses the potentially harmful effects of exposure to diisocyanates and methods to control exposure. The employers were encouraged to post the bulletin at their worksite and to ensure that applicators are protected from exposure.

Copies of the *Alert* can be requested by using the order form on page 23 or can be downloaded from our Work-related Asthma Web site at www.nj.gov/health/eoh/survweb/wra.

Thai Public Health Officials Visit DHSS

In July 2005, the Occupational Health Surveillance Program welcomed two public health officials from Thailand (see photo below) on a three-day visit to learn about New Jersey's occupational disease and injury surveillance systems. Drs. Priyakamon Khan and Orawan Kaewboonchoo, who are on the faculty at Mahidol University in Bangkok, belong to a panel of scientists who have been charged by the Thai government to develop an occupational health surveillance system in Thailand. Other members of the panel visited institutions in Finland, France, and Japan.

Thailand is one of the fastest growing industrialized countries in Southeast Asia. The country's workforce consists of 15.4 million (46%) workers in the agricultural sector and 18 million (54%) non-agricultural workers. The growing non-agricultural sector includes 4.8 million (27%) workers in manufacturing industries, 1.4 million (8%) in construction, 4.6 million (26%) in trade/business, and 6.2 million (39%) in the service sectors.

During off hours, Occupational Health Service staff provided our Thai guests with tours of the Jersey Shore, Princeton University campus, Trenton's Chambersburg historic restaurant district, and, of course, the local shopping mall.

Back row - from l to r: Patrick Bost, Katharine McGreevy, Barbara Gerwel, Rukmani Ramaprasad, Anne Willet, Emily O'Hagan, Noreen Heverin, Helga Fontus, James Blando, Devendra Singh, Donald Schill, Daniel Lefkowitz.
Front row - from l to r: David Valiante, Dr. Priyakamon Khan, Gary Ludwig (Director, Occupational Health Service), Dr. Orawan Kaewboonchoo

Bookmark our new Work-related Asthma Web site

www.nj.gov/health/eoh/survweb/wra

- Publications
- Reporting form in electronic format
- Links to related sites
- Bibliography

DHSS releases 2005 Asthma Update

In September 2005, the New Jersey Asthma Program released its *Asthma in New Jersey - Update 2005*. The report presents the most recent statewide data on asthma and is the third annual update published by the DHSS. The updated report is divided into two sections. Part I presents data on asthma prevalence, risk factors, morbidity, and mortality for all New Jersey residents. Part II presents data from the New Jersey work-related asthma surveillance program.

The *2005 Update* can be downloaded at www.nj.gov/health/fhs/asthma.shtml.

NIOSH Publishes Worker Health Chartbook 2004

The *Chartbook*, NIOSH Pub. No. 2004-146, is a descriptive epidemiologic reference on occupational morbidity and mortality in the United States.The document consolidates and presents an integrated view of occupational safety and health surveillance data and information from 19 state surveillance programs, including those of DHSS, and illness in the United States. It is a valuable resource for agencies, organizations, employers, researchers, workers, and others who need to know about occupational illnesses and injuries.

The *Chartbook* can be accessed at www.cdc.gov/niosh/docs/chartbook.

WRA DIAGNOSIS
Continued from page 1

for new-onset allergic asthma and 31 years of age for new-onset irritant-induced asthma, while the mean age of individuals diagnosed with work-aggravated asthma is 30 years of age. It is therefore critical that physicians and advanced practice nurses consider the possible role of workplace exposures in all cases of adult asthma, and report to the DHSS whenever WRA is suspected or confirmed. Instructions on how to submit a case report and guidelines for reporting clinical cases are provided on pages 8 and 19, respectively.

Diagnosis of WRA

WRA is suspected on the basis of temporal associations between symptoms and time spent at and away from work. The following patterns of association between asthma symptoms and work are used to suggest the diagnosis of WRA:

- Asthma symptoms develop or worsen with a new job or introduction of new materials.
- Asthma symptoms develop within minutes of specific activities or exposures at work.
- Delayed symptoms occur hours after exposure or during the evening on work days.
- No symptoms or fewer symptoms occur on days away from work and on vacation.
- Symptoms worsen on return to work after being away.

There are two general types of new-onset WRA:

- Allergic (immunologically- mediated) asthma which develops after a period of exposure to a sensitizing agent, and
- Reactive airways dysfunction syndrome (RADS), or irritant-induced asthma, which is a non-immunologic asthma that is typically caused by a single exposure to high levels of an irritating vapor, gas, fume, or smoke.

WRA also includes work-aggravated asthma, which is pre-existing asthma exacerbated by workplace exposures. Detailed information on diagnosis and reporting of cases to the DHSS can be found in our publication entitled *Guidelines - Work-Related Asthma Recognition, Diagnosis, and Reporting*. Please see page 23 for an order form.

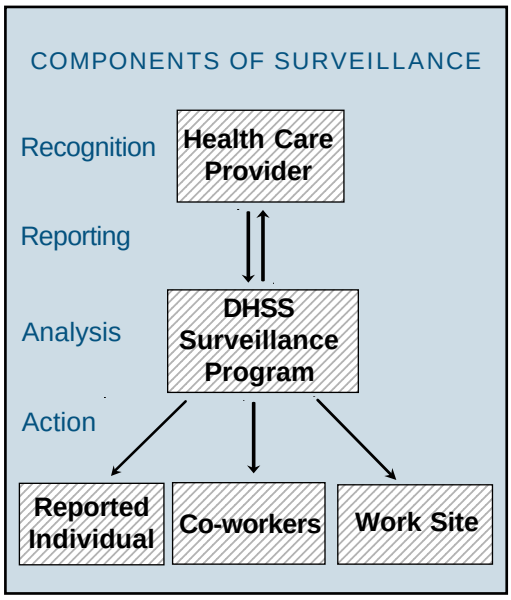
Prevention of WRA

Early recognition of asthma and its connection to the workplace is crucial in directing intervention efforts to reduce and eliminate exposure to asthma-causing agents. Identification of work-related asthma can also lead to the recognition of affected coworkers, the identification and correction of inadequate workplace exposure control measures, and the discovery of new causes of work-related asthma.

So, what role does the DHSS play in the prevention of work-related asthma? What happens after a case is reported to the DHSS? Figure 1 summarizes the key components of the surveillance model adopted by DHSS and other States in the prevention of work-related diseases and injuries. Reported cases are interviewed to obtain demographic characteristics and exposure information, name of employer where exposure occured, and medical information. Medical and exposure information are evaluated by project staff to confirm that the person has work-related asthma. The diagnosis of work-related asthma is confirmed based on the criteria summarized on page 19.

If the patient gives permission to the DHSS to contact his/her employer and workplace intervention is appropriate, an industrial hygiene (IH) evaluation is conducted (see article on IH intervention on page 6). The health provider who made the case report is invited to join DHSS staff on the site visit. A report with recommendations is provided to the patient, his or her physician, the employer, and the local health department.

FIGURE 1



The DHSS also provides free consultations by our occupational health physician to assist with WRA case classification. A list of physician specialists to assist those with clinical questions regarding the diagnosis of WRA is also available. Our IH staff can answer questions regarding conditions and exposures at the patient's workplace that may be associated with WRA. Free educational materials for the patient and for the physician can be requested using the order form on page 23 or downloaded from the DHSS Work-related asthma Web site at www.nj.gov/health/eoh/survweb/wra.□

References

1. Chan-Yeung M. Occupational asthma, Chest, 98:5, November 1990 supplement, 148s-161s.
2. Lozewics S, et al. Outcome of asthma induced by isocyanates, Br J Dis Chest, 1987;81:14-22.
3. Burge PS. Occupational asthma in electronic workers caused by colophony fumes: follow-up of affected workers. Thora, May 1982;37(5):348-53.

WORK-RELATED ASTHMA
PUBLICATIONS ORDER FORM

Please type or print neatly.

Name: _____

Street Address: _____

_____

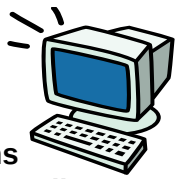
City: _____ **State:** _____ **Zip:** _____

Telephone: ( ) _____ **Fax: ( )** _____

TITLE OF PUBLICATION	QUANTITY			
Work-related Asthma Publications				**Other**
New Jersey Law Requires Physicians and Advanced Practice Nurses to Report Individuals Diagnosed with Work-Related Asthma (office poster)	1	5	10	_____
Guidelines - Work-Related Asthma Recognition, Diagnosis, and Reporting	1	5	10	_____
Reporting Work-Related Asthma - Important Information	1	5	10	_____
Do You Have Work-Related Asthma? (patient brochure)	1	5	10	_____
Industries and Asthmagens Associated with Work-Related Asthma	1	5	10	_____
Every Breath Counts! - Important Information for Adults with Asthma (pharmacy insert)	1	5	10	_____
Work-related Asthma Resources	1	5	10	_____
Asthma and Cleaning Products - What Workers Need to Know	1	5	10	_____
Other Publications				
OCC-31 Reporting Form: Occupational Disease, Injury, or Poisoning Report For Physicians And Advanced Practice Nurses	1	5	10	_____
Exposure History Form	1	5	10	_____
HIPAA and the Provision of Protected Health Information to the NJDHSS	1	5	10	_____
Latex Allergy - A Guide to Prevention (patient brochure)	1	5	10	_____
Guidelines on "Management of Natural Rubber Latex Allergy " and "Selecting the Right Glove for the Right Task in Health Care Facilities"	1	5	10	_____
Glutaraldehyde: Guidelines for Safe Use and Handling in Health Care Facilities	1	5	10	_____
Occupational Health and Funeral Homes	1	5	10	_____
Ventilation of Funeral Home Preparation Rooms - Guidelines and Calculations	1	5	10	_____

Please complete order form and fax to (609) 292-5677 or mail to:

New Jersey Department of Health & Senior Services
Occupational Health Surveillance Program
H&A Bldg Rm 701
PO Box 360
Trenton NJ 08625-0360



All publications are also available online at: www.nj.gov/health/eoh/survweb/wra

Occupational Illness and Injury Reporting to the New Jersey Department of Health & Senior Services												
	Number of New Individuals Reported[1]											
Condition	From beginning of reporting through 1994	'95	'96	'97	'98	'99	2000	2001	2002	2003	2004	Cumulative Total
Fatal injuries [2]	1,502	118	99	101	103	103	115	129	129	104	129	2,632
Work-related asthma [3]	367	57	39	72	22	9	8	5	6	8	127	720
Silicosis [4]	1,002	25	47	43	40	34	30	33	20	35	41	1,350
Other pneumoconioses [5]	5,827	655	611	498	417	1,609	1,581	1,746	1,424	1,765	1,806	17,939
Acute lung conditions [5]	813	68	82	59	32	140	132	137	138	154	193	1,948
Chemical poisonings [5]	2,257	216	150	129	145	289	204	246	226	227	325	4,414
Elevated blood lead levels [6]	3,622	181	220	186	137	196	206	252	159	110	131	5,400
Elevated blood and urine mercury levels [6]	415	23	34	11	35	20	33	36	30	30	48	715
Elevated blood and urine cadmium levels [6]	276	30	17	18	16	9	24	6	9	25	6	436

[1] Includes confirmed and unconfirmed cases.
[2] Data sources: death certificates, medical examiners' reports, OSHA, workers' compensation reports, Fatal Accident Reports, and news clippings. Reporting began in 1983.
[3] Data sources: physician reports and hospital discharge data. Reporting began in 1988. Reporting by hospital emergency departments began in 2004.
[4] Data sources: hospital data, physician reports, and death certificates. Reporting began in 1979. Incomplete reporting from hospitals in 1993 and 1994.
[5] Data source: hospital data. Reporting began in 1985. However, starting in 1999, reporting changed to electronic hospital discharge data; cases from previous years may be included.
[6] Data sources: laboratory and physician reports. Reporting began in 1985. However, starting in 2003, cases from previous years may be included.

New Jersey Department of Health & Senior Services
Occupational Health Surveillance Program
PO Box 360
Trenton, NJ 08625-0360

Phone: (609) 984-1863
Fax: (609) 292-5677
e-mail: surveillance@doh.state.nj.us