

# Work-Related Asthma



**Work-related Asthma and You:  
Preventing Work-related Asthma  
in Health Care Workers**



## **Acknowledgements**

OHCOW and OSACH are non-profit organizations that have worked together in producing this booklet to create awareness of work-related asthma and to help prevent it. The Ministry of Health and Long Term Care funded this project with the collaboration of the Ministry of Labour.

OHCOW is a multi-disciplinary team of health care professionals committed to promoting the highest degree of physical, mental and social well being for workers and their communities.

OSACH assists health care and community sector organizations and their workers to achieve safe and healthy work environments through the prevention and reduction of workplace injuries, illness and disease.

# Work-related Asthma and You: Preventing Work-related Asthma in Health Care Workers

## Do I Need to Know about Work-related Asthma?

More than three million Canadians suffer from asthma. Every year, 20 children and 500 adults die from the condition. According to the Canadian Lung Association, more than 80% of these deaths could be prevented through proper asthma education.<sup>1</sup>

If you work in health care, you should be aware of work-related asthma. According to the Workplace Safety and Insurance Board (WSIB) in Ontario, health care workers may be more likely to get work-related asthma than many other workers. Many of the 250+ known asthma-causing agents exist in the health care work environment. Health care workers are at increased risk if they clean medical instruments, use powdered latex gloves or administer aerosol medications.<sup>2</sup>

Work-related asthma can be a serious condition that can result in disability and job loss if it is not recognized and treated early enough. Early management tends to prevent worsening of the condition. It is important for employers and employees to work together to prevent it from occurring in their workplace.

The costs of untreated work-related asthma are high for both employers and workers. These financial and health-related costs can be largely prevented by incorporating a comprehensive prevention strategy in the workplace, to help prevent work-related asthma before it occurs (Table 1).

Work-related asthma can be treated and managed if it is recognized early. Early recognition prevents the

illness from getting worse because it allows appropriate treatment and modifications in exposure.

If asthma has been caused by work (occupational asthma), early recognition also makes it more likely to be able to reverse the course of the illness and plays an important role in preventing occupational asthma in other workers.

This booklet is designed to help employers and workers in health care:

- recognize work-related asthma
- put general strategies in place that both employers and workers can use to help prevent work-related asthma, and
- know when, where and how to get professional help.

## How Significant is the Problem?

Work-related asthma is a serious occupational health problem. It is the most common chronic occupational lung disease in industrialized countries. About 10–15% of all new asthma cases in adults are thought to be work-related.

From 2001 to 2005, the WSIB accepted 182 claims of work-related asthma from the health care sector, paying \$525,169 in compensation. However, these numbers may underestimate the actual rate of occurrence and costs of work-related asthma in health care, due to low rates of reporting, recognition and diagnosis of work-related asthma.<sup>4, 5</sup>

Work-related asthma is preventable. These illnesses and costs can largely be avoided in the future.

**Table 1:** Comparison of Results from Untreated Work-related Asthma and a Work-related Asthma Prevention Strategy in the Workplace

Untreated Work-related Asthma	Work-related Asthma Prevention Strategy*
<ul style="list-style-type: none"> <li>• Loss of productivity</li> <li>• Staff turnover</li> <li>• Increased insurance costs (including medical and drug-related costs)</li> <li>• Disability (morbidity and mortality)</li> <li>• Loss of work and income</li> <li>• Reduced quality of life</li> </ul>	<ul style="list-style-type: none"> <li>• Greater productivity</li> <li>• Improved working conditions</li> <li>• Reduced insurance premiums</li> <li>• Less sick time</li> <li>• Decreased economic burden for all taxpayers</li> <li>• Improved quality of life</li> </ul>

\* In 2004, Medavie Blue Cross and GlaxoSmithKline devised a two-year study, in seven New Brunswick workplaces, known as *Inspire at Work*, to determine whether a workplace asthma education program would result in improved asthma control. Employers' return on investment was found to be \$4.24 for every dollar spent on the intervention program. In addition, participants' absenteeism decreased from 1.54 days lost per three months to 0.15 days lost per three months. Participants' productivity levels, while bothered by their asthma symptoms, increased to 95.9 per cent from 85.4 per cent over the course of the study, and their understanding of asthma and proper medication usage significantly increased.

## What is Asthma?

People who have asthma have increased sensitivity in the airways, called hyper-responsiveness. The airways become irritated and inflamed when substances that cause or provoke asthma are inhaled, and:

- the muscles around the airway tighten
- the airway tissues swell, and
- excess mucus is produced.

All of these events can prevent the person from moving air freely in and out of the lungs, producing shortness of breath and chest tightness (see Figure 1, below).

The substances that cause or provoke asthma are called sensitizers (or allergens) and triggers.

- Sensitizers cause the development of a specific immune (allergic) response. Usually they are associated with an allergen (a substance that causes allergic symptoms). Once sensitized, inhaling the sensitizer causes the affected person's airways to react.
- Triggers can include non-specific irritants. Irritants do not produce a specific immune (allergic) reaction; however, they irritate the tissue lining the airways and can aggravate asthma.

Both sensitizers and triggers may lead to an asthmatic reaction, causing symptoms such as coughing, wheezing, difficulty breathing and chest tightness.

## What is Work-related Asthma?

Asthma is work-related when it is induced or triggered by an agent that a person comes in contact with at work. These workplace agents take the form of dusts, fumes, gases and vapours.<sup>6, 7</sup> Some of the agents found in health care are listed in Table 2 (pages 3 and 4). When they are inhaled, these agents can cause the airways to tighten, the tissues to swell and the airways to fill with mucus.<sup>8</sup>

All of these responses decrease the ability to breathe. In addition, it has been suggested that a worker might get occupational asthma after becoming sensitized to an agent as a result of skin exposure.<sup>9</sup>

There are three main types of work-related asthma:

1. Occupational asthma due to sensitization (e.g., latex exposure)
2. Occupational asthma due to irritation - reactive airways dysfunction syndrome (RADS) (e.g., chlorine gas exposure), and
3. Work-aggravation of a pre-existing asthma.

## Occupational Asthma

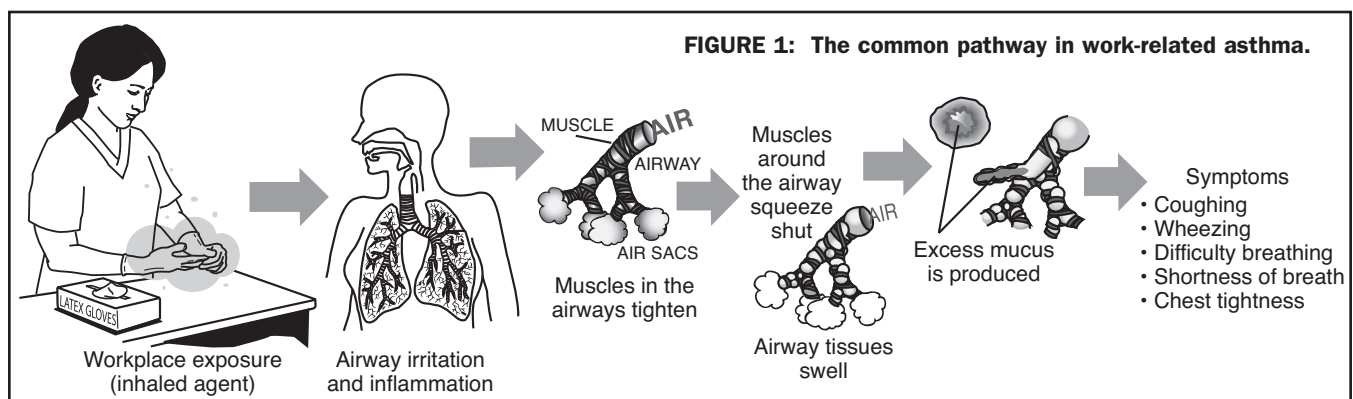
### ASTHMA DUE TO ALLERGY IN THE WORKPLACE

When a sensitizer is inhaled, the body builds up its immune defences against the agent. This is known as sensitization. This "allergic" response is often caused by one of the sensitizers listed in Table 2. The process may take from two weeks up to 30 years to occur. This is called the latency period. After a person has become sensitive, even very low concentrations of the sensitizing agent can cause an asthmatic reaction. This type of occupational asthma accounts for the majority of compensation claims for occupational asthma.

### ASTHMA DUE TO IRRITANTS

Asthma resulting from an irritant is also referred to as reactive airway dysfunction syndrome (RADS). RADS begins after a person's airways have become severely irritated by a high-level, often accidental, exposure to a workplace irritant. RADS usually occurs after one high-level exposure, as seen with spills, but a similar syndrome (irritant-induced asthma) can also appear after several exposures.

Symptoms of asthma usually start less than 24 hours after the airways become highly irritated. These symptoms can persist. When they last three months or more and fulfill additional criteria, RADS, as a form of occupational asthma, is diagnosed.



**Table 2: Agents in Health Care Known to Cause or Aggravate Work-related Asthma** <sup>2, 10-14</sup>

Job Categories	Sensitizing and Triggering Agents
All health care workers*	<p>Sensitizing Agents</p> <ul style="list-style-type: none"> <li>• Natural rubber latex (NRL) used in gloves, catheters and rubber bands or found in airborne latex particles</li> <li>• Disinfectants and cleaning agents (see below)</li> <li>• Moulds</li> <li>• Dusts</li> </ul> <p>Triggering/Irritating Agents</p> <ul style="list-style-type: none"> <li>• Perfumes and other strongly scented products</li> <li>• Miscellaneous chemicals (including glues and solvents)</li> <li>• Cleaning products</li> <li>• Moulds</li> <li>• Dusts</li> </ul>
All health care workers, in particular, physicians, dentists, dental hygienists and assistants, nursing staff (nurses, practical nurses and nurse practitioners), housekeeping staff and CSD staff doing general duties	<p>Sensitizing Agents</p> <ul style="list-style-type: none"> <li>• NRL (powdered latex gloves, airway masks, medication vial tops, tourniquets, anaesthesia bags, various catheters, and supplies for intravenous use [read labels])</li> <li>• Quaternary ammonium compounds (widely used disinfectants)</li> <li>• Other disinfectants and cleaning agents (see below)</li> <li>• Formaldehyde</li> </ul> <p>Triggering/Irritating Agents</p> <ul style="list-style-type: none"> <li>• Cleaning products</li> </ul>
Housekeeping staff, nursing staff and all others who disinfect and clean (all surface areas)  All other staff exposed to freshly cleaned floors and other areas	<p>Sensitizing Agents</p> <ul style="list-style-type: none"> <li>• Quaternary ammonium compounds: benzalkonium chloride</li> <li>• Other disinfectants: chlorhexidine, chloramine and hexachlorophene</li> <li>• Amine compounds: amino alcohols and aliphatic polyamines</li> <li>• Lauryl dimethyl benzyl ammonium chloride (in some floor cleaners)</li> <li>• Pine products (colophony, tall oil)</li> <li>• Tributyltin oxide (fungicide and disinfectant)</li> <li>• Mixing cleaning products that contain chlorine bleach with ammonia (can cause RADS)</li> </ul> <p>Triggering/Irritating Agents</p> <ul style="list-style-type: none"> <li>• Other cleaning products</li> <li>• Acetic acid</li> </ul>
Nursing staff, respiratory therapists and all others who disinfect medical or dental instruments, including: <ul style="list-style-type: none"> <li>• endoscopy equipment (fibrescopes)</li> <li>• dialysis instruments, and</li> <li>• surgical instruments</li> </ul>	<p>Sensitizing Agents</p> <ul style="list-style-type: none"> <li>• Glutaraldehyde (endoscopic cold sterilant)</li> <li>• Other aldehydes, such as orthophthaldehyde</li> <li>• Proteolytic enzymes</li> <li>• Subtilisins (enzymatic cleaners)</li> <li>• Ethylene oxide (sterilant)</li> </ul>
Nursing staff (geriatrics) who prepare psyllium	<p>Sensitizing Agent</p> <ul style="list-style-type: none"> <li>• Psyllium (laxative)</li> </ul>

\* Health care workers include, but are not limited to: doctors (including dentists); nursing staff (e.g., registered nurses, registered practical nurses and nurse practitioners); allied health professionals (e.g., pharmacists, dietitians, physiotherapists, occupational therapists, respiratory therapists, laboratory technicians, radiology technologists, psychologists, dental hygienists); dietary, housekeeping, security, plant maintenance and engineering staff; materials management staff (central service department [CSD], stores, receiving, mail room, printing, purchasing), information technology staff, audio visual staff, and everyone else who works in a health care facility or setting (e.g., office staff, public relations, spiritual care) in any organization where health care diagnosis and/or therapy is provided.

**Table 2: Agents in Health Care Known to Cause or Aggravate Work-related Asthma** <sup>2, 10-14</sup>

Job Categories	Sensitizing and Triggering Agents
OR staff (orthopedics) doctors, nurses and others who mix bone cement	Sensitizing Agent <ul style="list-style-type: none"> <li>• Methyl methacrylate (bone cement)</li> </ul>
All OR staff (nursing, housekeeping and any other staff in the OR) who disinfect the OR	Sensitizing Agent <ul style="list-style-type: none"> <li>• Chloramine T (disinfectant)</li> </ul>
Radiology staff who: <ul style="list-style-type: none"> <li>• load film</li> <li>• remove processed film</li> <li>• mix chemicals</li> <li>• clean rollers</li> <li>• clean up processor leaks</li> <li>• unblock processor drains, or</li> <li>• free film jams</li> </ul>	Sensitizing Agents <ul style="list-style-type: none"> <li>• Glutaraldehyde</li> <li>• Formaldehyde</li> </ul> Triggering/Irritating Agents <ul style="list-style-type: none"> <li>• Sulfur dioxide (SO<sub>2</sub>)</li> <li>• Acetic acid</li> </ul>
Radiology staff (diagnostic imaging)	Sensitizing Agent <ul style="list-style-type: none"> <li>• Radiograph fixative (glutaraldehyde)</li> </ul> Triggering/Irritating Agents <ul style="list-style-type: none"> <li>• Acetic acid</li> <li>• Hydrochloric acid</li> </ul>
Laboratory technicians	Sensitizing Agents <ul style="list-style-type: none"> <li>• Proteases</li> <li>• Amylase</li> <li>• Formaldehyde</li> <li>• Isononanoyl oxybenzene sulfonate (preservative/disinfectant)</li> <li>• Ninhydrin</li> </ul>
Pharmacists and pharmaceutical technicians who mix and dispense pharmaceuticals  Nursing staff who crush tablets, mix powders or prepare lypholized solutions	Sensitizing Agents <ul style="list-style-type: none"> <li>• Antibiotics: including cephalosporins, penicillins, piperacillin, amoxicillin, ampicillin, isoniazid, tetracyclines</li> <li>• Anti-hypertensives: hydralazine, methyldopa</li> <li>• Opiates: codeine, morphine</li> <li>• Other medications: ipecac, cimetidine, salbutamol intermediate, piperazine dihydrochloride</li> <li>• Enzymes: lysozyme chloride, serratial peptidase, amylase, proteolytic enzymes (papain, trypsin, chymotrypsin, bromalain)</li> </ul>
Respiratory therapists, nursing staff and doctors who administer aerosolized medications	Sensitizing Agents or Triggering Agents <ul style="list-style-type: none"> <li>• Aerosolized medications: pentamidine, ribavirin</li> </ul>
Embalmers, researchers and others working on cadavers	Sensitizing Agent <ul style="list-style-type: none"> <li>• Formaldehyde</li> </ul>
Maintenance/Engineering staff, in particular, those who solder	Sensitizing Agents <ul style="list-style-type: none"> <li>• Colophony flux (from soldering)</li> <li>• Dusts</li> <li>• Moulds</li> </ul> Triggering/Irritating Agents <ul style="list-style-type: none"> <li>• Dusts</li> <li>• Moulds</li> </ul>
Dentists, dental assistants, and dental lab technicians who use dental acrylate compounds	Sensitizing Agents <ul style="list-style-type: none"> <li>• Methyl methacrylate, cyanoacrylates and epoxy acrylates</li> </ul>

## WORK-AGGRAVATED ASTHMA

Workers who already have asthma (pre-existing asthma) can get work-aggravated asthma when the asthma is worsened by non-specific irritants in the workplace, such as dusts, smoke, fumes, sprays, perfumes and fragranced products. Cold temperatures, dry air or exertion at work can also aggravate asthma.

A worker who has pre-existing asthma needs to pay particular attention to whether symptoms increase during the workday or workweek. If so, the worker should see the doctor right away, to make sure the asthma is properly managed. The WSIB may also compensate workers who have work-aggravated asthma.

**Regardless of the type of work-related asthma you have, you must take action right away!**

### How do I Recognize Work-related Asthma?

Common symptoms of asthma (including work-related asthma) are:

- coughing
- wheezing
- difficulty breathing
- shortness of breath, and
- chest tightness.

These symptoms may not occur until after the work shift (e.g., several hours after leaving work) or towards the end of the workweek. Significant improvement over a weekend or holiday may help to identify work-relatedness.

Usually, only some of the workers who are exposed to asthma-causing agents become sensitized to them and they may be affected at different times. However, if one worker has occupational asthma, other workers are likely exposed to the same asthma-causing agent or agents and may be affected now or in the future. Therefore, the presence of one worker who has occupational asthma is a sign (sentinel event) that intervention is needed to protect other workers.

### What Can You Do?

#### Assess Your Risk

To help find out whether you may have work-related asthma, ask yourself the following questions:

1. Do I work with any of the chemical agents listed in Table 2 or any other asthma-causing agents?  
 Yes       No
2. Do I have symptoms of asthma?  
 Yes       No

3. Did my symptoms of asthma first start, or become worse, after I began to work in this job or field of work?  
 Yes       No
4. Do my symptoms get worse as the workday goes on?  
 Yes       No
5. Do my symptoms improve on holidays and/or when I am away from work?  
 Yes       No
6. Do my co-workers have symptoms of asthma?  
 Yes       No

#### Talk to Your Supervisor and Joint Health and Safety Committee

If you answered yes to questions 1 and 2, and yes to at least one other question, you need to be assessed to determine whether your symptoms are work-related. You can visit your occupational health/employee health department and your family doctor. If they suspect your problem is work-related or you are concerned that the problem is work-related, you should tell your supervisor, complete an employee incident report and notify your joint health and safety committee (JHSC) and/or union representative.

#### Make an Appointment with Your Doctor

You need to go to your doctor if you suspect that you have work-related asthma. Make an appointment right away with your family doctor and/or an occupational health professional such as an occupational health nurse or doctor (e.g., from your occupational health/employee health department). Tell him or her:

- your symptoms (and those of your co-workers)
- where you work
- what substances (chemicals and materials) you are exposed to, and
- how long you have worked with these substances (throughout your working life).

The sooner you recognize the symptoms, the better. With early recognition, accurate diagnosis and treatment, asthma can be managed. The lung function of workers who have sensitizer-induced asthma improves after they are protected or removed from the sensitizer. However, when an affected worker does not have proper protection from the sensitizer, asthma symptoms usually become more severe with repeated exposure.<sup>15</sup> Long-term exposure can result in permanent lung changes and disability.

Early diagnosis, treatment and workplace interventions can help stop occupational asthma before permanent

lung change (permanent asthma) occurs. Neglecting the signs and symptoms can lead to serious long-term health complications. In some cases, untreated occupational asthma has even resulted in death.

Allowing the disease to progress without medical management and workplace interventions can significantly affect the activity level, productivity, ability to work and, most importantly, the health and quality of life of you and your co-workers.

## Diagnosis

The diagnosis of occupational asthma (caused by work) requires specialized tests, which may include skin testing to determine sensitization to a work substance, and monitoring of breathing tests at work and off work. These usually need to be arranged by a specialist such as a respirologist, allergist or an occupational medicine doctor with expertise in occupational asthma.

These tests can also help to determine whether asthma is caused or aggravated by the workplace, and this information is necessary for appropriate management. Early referral and investigation are important before any decisions are made that may affect the worker's job.

## What Can Workplaces Do to Prevent Work-related Asthma?

### Identify Asthma-causing Agents

Agents other than those listed in Table 2 can lead to asthma in the workplace. New asthma-causing agents are being discovered each year. Material safety data sheets (MSDSs) are a good place to start.

Occupational health professionals, such as occupational health doctors, nurses and occupational hygienists, can help identify agents in your workplace that may be asthma sensitizers or triggers. Start with the occupational health/employee health department in your workplace.

If you need more help, a team from the Occupational Health Clinics for Ontario Workers (OHCOW) can provide a free, on-site workplace assessment and make recommendations to improve workplace conditions. You may also ask your Ontario Safety Association for Community & Healthcare (OSACH) regional consultant to conduct an on-site assessment. A referral will be required from your employer or the JHSC before staff from OHCOW or OSACH can respond. Check the back page of this document for contact information.

### Prevention Strategy

All employers and workers in the health care industry need to work towards preventing work-related asthma in their workplaces. If a prevention strategy is not already in place, the employer should establish one, in consultation with the JHSC. A comprehensive prevention strategy includes:

1. An exposure-control program
2. Medical surveillance, and
3. Management of work-related asthma.

### EXPOSURE CONTROL

One component of preventing occupational asthma is being able to recognize early symptoms and identify the potential workplace exposures (Table 2). More importantly, the prevention strategy should include an exposure-control program in the workplace.

The risk of developing occupational asthma varies with different exposure agents. Some carry more risk than others. In addition, the risk for many agents relates to the level of workplace exposures: the higher the exposure level, the greater the risk to workers. Therefore, removing or reducing workers' exposure to the sensitizing agent or agents can reduce the incidence of occupational asthma in the workplace. This preventive approach requires the cooperation of employers and workers.

An exposure-control program identifies the risk to workers from asthma sensitizers and triggers such as NRL and glutaraldehyde. Once the risk of exposure is known, it can be controlled.

An exposure-control program is a step-by-step process. Below are general guidelines that can be used by employers and JHSCs to prevent workers from being exposed to asthma-causing agents, which carry a significant risk of sensitization.

1. With the help of an occupational health professional, **identify** all of the hazardous substances in the workplace.
2. Try to **eliminate** each hazardous substance by removing it from the workplace. For example, when radiology departments switch to digital imaging, workers are no longer exposed to glutaraldehyde, formaldehyde and other asthma-causing chemicals used in film processing. However, this approach cannot be taken for all potential asthma-causing agents.
3. If a hazardous substance cannot be eliminated, **substitute** a less hazardous substance or product. It can be difficult to find effective substitutes for some of the chemicals listed in Table 2, but some successful substitutions have helped to minimize exposures in the health care industry. The substitution may involve replacing the substance or changing the form it takes. For example:
  - **Use latex-free gloves** (e.g., nitrile, vinyl, neoprene, butyl rubber or polyurethane) for general housekeeping, food preparation, and most medical procedures, or *at all times if you are sensitized to NRL*

- **When latex\* gloves are indicated, use low-protein gloves, with no or low powder content** (for more information, see Gloves, below)
- **Use alternatives to glutaraldehyde**, such as accelerated hydrogen peroxide, peracetic acid or products that contain both agents,<sup>16</sup> and
- In **orthopaedics, eliminate methyl methacrylate** (bone cement) **in favour of a cement-free technique.**

The substitution of a “safer” chemical should be reviewed closely to ensure that it really is safer (i.e., that it has been well-tested or researched for occupational hazards).

4. **Control exposures** by using appropriate engineering designs in the workplace. These types of controls protect all workers. For example, if it is not possible to use a safer alternative to a substance such as glutaraldehyde, here are some ways to control the exposure levels:
  - **Centralize glutaraldehyde stations** into a few key locations. Provide emergency eyewash units. Use safety features such as absorbent mats and safety nozzles
  - Install **local ventilation systems** to exhaust glutaraldehyde vapours away from workers
  - Use a **closed system**, such as a Lutz machine, if you are using glutaraldehyde to process chemicals for x-rays, and
  - **Improve general ventilation** in all work areas where glutaraldehyde is used to improve the overall air quality in the work area.<sup>17</sup>
5. Implement administrative controls, such as policies, procedures, safe work practices, job rotation and minimizing exposure time of workers.
6. Provide **personal protective equipment (PPE)**. PPE is the last line of defence, to be used when exposures are not already prevented or significantly reduced by elimination, substitution and control. All workers using PPE should receive training in its proper use and care (for glove use, see opposite and page 8). When masks or respirators are indicated, provide a detailed respiratory protection program that includes proper selection, training in its use, and fit testing and maintenance, as required.
7. Incorporate an **exposure-monitoring program** to measure exposure levels to hazardous substances, such as ethylene oxide and formaldehyde. This will also test the effectiveness of the control measures.

An occupational hygienist can help you set up a comprehensive exposure-monitoring program. To determine the compliance of your program with standards:

- identify potentially hazardous areas
- measure levels of exposure and compare them with standards (as identified by an occupational hygienist), and
- develop exposure profiles.

Post the exposure levels for everyone to see.

8. From time to time, review your exposure-control program to assess its effectiveness.

It is not possible or reasonable to avoid all potential asthma triggers (e.g., exercise, cold air, dusts, fumes, common allergens). Prevention of work-aggravated asthma includes good control of asthma by environmental control measures at home and work and by optimizing asthma medication use. This is especially important for those who have moderate or severe asthma.

### Gloves

Proper gloves are needed to provide protection from contact with blood-borne infections and chemicals. However, all gloves are not equal. From the mid 1980s through the 1990s, NRL gloves were used extensively in health care, as they provide superior protection against blood and other bodily fluids, are relatively comfortable to wear and protect the hands against a number of chemical agents.

NRL products are manufactured from a milky fluid derived from the rubber tree. Several chemicals are added to this fluid during the processing and manufacture of commercial latex.

Some of them, such as thiurams, can be sensitizers and/or irritants. Moreover, some of the proteins in NRL are sensitizing agents, and continued use can lead to allergy and occupational asthma.



\* Throughout this document, the term “latex” refers to NRL.

The latex in powdered gloves is released into the air whenever a person removes his or her gloves, and then is carried by the airborne powder into the general work area where it may be inhaled by other workers.

Control latex-containing dust through good house-keeping practices in the workplace. Identify areas that need frequent cleaning due to latex dust (upholstery, carpets, ventilation ducts and plenums) and ensure ventilation filters and vacuum bags in high-latex areas are changed frequently.<sup>18</sup>

Due to an increased incidence of occupational asthma in health care workers associated with the use of latex gloves, their use has been significantly reduced since the late 1990s. Low-protein, low- or no-powder NRL gloves are available, with a much lower risk of sensitization.

Another alternative is nitrile gloves, which are made from synthetic latex and contain no latex proteins. Therefore, in contrast to NRL gloves, nitrile gloves are not associated with sensitivities, allergies and occupational asthma.

Researchers estimated that previously 5–18% of health care workers were latex-sensitive when high-protein powdered NRL gloves were used.<sup>19</sup> Your employer should have a policy, measures and procedures for glove use, as well as provide education and training for workers (developed in consultation with the JHSC). If your workplace does not have a policy, measures and procedures in place, ask your JHSC to make a written recommendation to the employer to develop a glove use policy. Below is a quick reference for glove use in health care (Table 3).

If you are allergic to NRL, you should never use NRL gloves or other NRL products.

**Scent-free Environment**

As perfumes can act as a trigger for work-aggravated asthma in some people, you may consider adopting a scent-free policy in your work area or workplace. For more information on scent-free policies, refer to the Canadian Lung Association. See the back page of this document for contact information.

**“Green” Cleaning Products**

As hospitals strive to be more environmentally responsible, “green” or “eco” cleaning products are now becoming available for use by hospitals and other health care facilities. While these products may be less harmful to the environment and less irritating to workers’ skin, eyes and respiratory systems than conventional cleaning products,<sup>20</sup> there is no guarantee that they won’t act as sensitizers or non-specific irritants, which may lead to work-related asthma in some individuals.

In general, look for products that are “third-party certified” as having fewer environmental and health effects. These products carry an Environmental Choice (Canada) or a Green Seal (US) label, if made in Canada or the United States, respectively. For more information, refer to *Hospitals for a Healthy Environment* program. See the back page of this document for contact information.

**Training and Education**

Employers, in consultation with the JHSC and their occupational health/employee health department, should provide training and education to workers

<b>Activity</b>	<b>Latex Status of Worker</b>	<b>Recommended Glove</b>
No or low exposure to infectious materials where caustic chemicals are not used (e.g., food preparation, changing bed linens, discontinuing IV line)	Irrelevant*	Vinyl
Low exposure to infectious materials where chemotherapeutic agents, disinfectants, cleaning solutions and other caustic chemicals are used	Irrelevant*	Nitrile, butyl rubber, neoprene or polyurethane. Check MSDSs for information about correct glove material to protect from specific chemical agents
Moderate to high risk of exposure to infectious materials (e.g., examination), with no exposure to caustic chemicals	Irrelevant*	Nitrile
Invasive procedures	Not latex sensitive	Low-protein, powder-free or low-powder latex surgical gloves
Invasive procedures	Latex sensitive	Non-NRL surgical gloves, such as nitrile
* For the specified activities, irrelevant means that it does not matter whether the worker is latex sensitive; the recommended glove is still the same.		

to help prevent and manage work-related asthma. A thorough training program should help workers to:

- identify the agents that can cause work-related asthma
- follow safe work practices to reduce exposure to these agents
- recognize the symptoms of work-related asthma, and
- understand the process of reporting concerns within the workplace and of seeking immediate medical attention.

Education on occupational asthma management and prevention is available, through this project, from OSACH consultants and OHCOW clinics, as well as other occupational health and respiratory clinics. You may also want to speak with a certified asthma educator by contacting the Lung Association's Asthma Action Helpline at 1-800-668-7682 (see *For More Information* on the back page).

### **MEDICAL SURVEILLANCE**

Medical surveillance helps to screen workers for possible signs and symptoms of asthma, and it objectively detects any changes in their lung function. Medical surveillance is done by your doctor or an occupational health doctor (i.e., from your occupational health/employee health department) in collaboration with your doctor.

Medical surveillance is suggested for workers who are exposed to agents that carry a relatively high risk of causing asthma, such as bakers, or workers exposed to diisocyanates, enzymes or complex platinum salts. Typically, medical surveillance consists of:

- questionnaires every six months
- pulmonary function tests, if indicated by the questionnaire and at intervals determined by the risk of exposure, and
- health histories, as determined by the doctor.

A doctor administers all the elements of the program.<sup>21</sup> If your workplace offers a medical surveillance program, each worker can decide whether to take part in the program and choose his or her doctor. The employer will be informed by the doctor if the worker is "fit" or "unfit" to work and the employer has the duty to accommodate the worker. Any further information, such as the results of the questionnaire or the medical tests, is confidential.

At this time, most health care institutions do not offer medical surveillance programs. However, if your workplace or work area has frequent or increasing numbers of occupational asthma cases, we recommend that a medical surveillance strategy, directed to workers at risk of exposure, be introduced and evaluated prospectively.

If you are exposed to any asthma-causing agents in a workplace that provides medical surveillance, we

strongly recommend that you participate in the surveillance program. We recommend this even when the exposure is to an agent that does not legally necessitate such a program.

### **MANAGING WORK-RELATED ASTHMA**

Preventing occupational asthma by controlling workplace exposures is always the primary objective of a workplace asthma prevention strategy. However, if a worker does develop work-related asthma, he or she needs medical treatment and protection from the offending agent or agents to keep the disease from getting worse.

Medical treatment is prescribed by a doctor. The treatment usually consists of short- and long-acting medications that are taken to control inflammation and constriction in the airways. All workers who have work-related asthma should consult their doctors to receive the appropriate diagnosis, medical care and monitoring.

Anyone who has work-related asthma also needs ongoing protection from asthma sensitizers or triggers at work, even if the asthma is controlled with medications. The law requires that the employer take every precaution reasonable in the circumstances for the protection of a worker.

Employees who have a diagnosis of sensitizer-induced asthma must be accommodated by completely removing them from all inhaled exposure to the sensitizer.<sup>8, 22</sup> These workers have been sensitized; therefore, inhaling even small amounts of the offending agent can start an asthmatic response.

The sooner a worker who has a diagnosis of sensitizer-induced asthma is removed from the exposure, the more likely recovery will be possible. Removal from the exposure involves either 1) changing the affected worker's duties in the current job to eliminate exposure to the offending agent or 2) changing jobs to one where he or she is not exposed to the agent. It may be necessary for the worker to leave the job temporarily on compensation. Each situation is different and needs to be discussed between the worker, union representative (as applicable) employer and doctor.

Workers who have work-aggravated asthma or RADS may also need modifications to reduce exposure to aggravating irritants in the workplace and, in the case of RADS, to reduce the risk of future accidental exposures affecting the same worker or other workers.<sup>8, 22</sup>

Work-related asthma can be largely prevented. Employers, industry agencies, workers, unions, JHSCs and health care professionals need to work together to help prevent work-related asthma and its consequences.

## For More Information

For more information on occupational asthma in the health care industry, see the fact sheet *Work-related Asthma in Health Care: Recognition and Prevention*, available from OHCOW and OSACH, as listed below. For more information on work-related asthma, see the Workplace Safety and Insurance Board (WSIB) fact sheet, *Asthma and Work: Facts for Workers* in Ontario, available at [http://www.wsib.on.ca/wsib/wsibsite.nsf/LookupFiles/OccDiseaseAsthma/\\$File/Asthma%20and%20work.pdf](http://www.wsib.on.ca/wsib/wsibsite.nsf/LookupFiles/OccDiseaseAsthma/$File/Asthma%20and%20work.pdf).

Our primary goal for this booklet is to improve the health and working conditions for all employees in your industry. Using awareness and prevention strategies, we want to help you to reduce the number of people affected by work-related asthma in these industries.

However, this booklet was designed to provide *general* guidelines for helping to reduce work-related asthma in the health care sector. If you have symptoms of work-related asthma, see your family doctor right away.

To speak with an occupational health professional about questions or concerns specific to your place of employment, contact the OSACH office or OHCOW clinic closest to you. Your doctor can also refer you directly to a respirologist, allergist or occupational medicine doctor with expertise in work-related asthma, for diagnosis and management.

For more information on scent-free policies in the workplace, see resources from the Canadian Lung Association at [http://www.lung.ca/protect-protegez/pollution-pollution/indoor-interieur/scents-parfums\\_e.php](http://www.lung.ca/protect-protegez/pollution-pollution/indoor-interieur/scents-parfums_e.php).

For more information about “green” cleaning in health care, refer to *Hospitals for a Healthy Environment* program at <http://www.h2e-online.org/docs/h2e10stepgreenclean-r5.pdf>.

## Occupational Health Clinics for Ontario Workers (OHCOW)

On the web: <http://www.ohcow.on.ca/> or by telephone at these locations.

### CLINICS

#### Hamilton Clinic

848 Main Street East  
Hamilton L8M 1L9  
Tel 905-549-2552 or 1-800-263-2129  
Fax 905-549-7993  
Email [hamilton@ohcow.on.ca](mailto:hamilton@ohcow.on.ca)

#### Sarnia-Lambton Clinic

171 Kendall Street  
Point Edward N7V 4G6  
Tel 519-337-4627  
Fax 519-337-9442  
Email [sarnia@ohcow.on.ca](mailto:sarnia@ohcow.on.ca)

#### Sudbury Clinic

1300 Paris Street, Suite 4  
Sudbury P3E 3A3  
Tel 705-523-2330 or 1-800-461-7120  
Fax 705-523-2606  
Email [sudbury@ohcow.on.ca](mailto:sudbury@ohcow.on.ca)

#### Toronto Clinic

970 Lawrence Avenue West, Suite 110  
Toronto M6A 3B6  
Tel 416-449-0009 or 1-888-596-3800  
Fax 416-449-7772  
Email [toronto@ohcow.on.ca](mailto:toronto@ohcow.on.ca)

#### Windsor Clinic

3129 Marentette Avenue, Unit #1  
Windsor N8X 4G1  
Tel: 519-973-4800 or 1-800-565-3185  
Fax: 519-973-1906  
Email: [windsor@ohcow.on.ca](mailto:windsor@ohcow.on.ca)

## Ontario Safety Association for Community & Healthcare (OSACH)

Corporate Office  
4950 Yonge St., Suite 1505  
Toronto, ON M2N 6K1  
Tel: 416-250-7444 or 1-877-250-7444  
Fax: 416-250-7484  
On the web: [www.osach.ca](http://www.osach.ca)

## For further information on work-related asthma, contact:

- The Lung Association’s Asthma Action Helpline: 1-800-668-7682
- The Lung Association: [www.on.lung.ca](http://www.on.lung.ca) or 1-888-566-5864
- The Asthma Society of Canada: [www.asthma.ca](http://www.asthma.ca) or 1-866-787-4050
- Workplace Safety and Insurance Board: [www.wsib.on.ca](http://www.wsib.on.ca) or 1-800-465-5606
- Workers Health and Safety Centre: [www.whsc.on.ca](http://www.whsc.on.ca) or 1-888-869-7950
- Ministry of Labour health and safety information: [www.labour.gov.on.ca/english/hs/index.html](http://www.labour.gov.on.ca/english/hs/index.html) or 1-800-268-8013

## References

1. Asthma Society of Canada. Asthma Facts and Statistics. *Fact Sheet Number 1*, April, 2005.
2. Delclos G, et. al. Occupational risk factors and asthma among healthcare professionals. *Am J Respir Crit Care Med* 2007; 175: 667–75.
3. Workers Safety and Insurance Board. Work-related asthma statistics from 2001–2005 in the health care sector.

4. Milton DK, Solomon GM, Rosiello RA, Herrick RF. Risk and incidence of asthma attributable to occupational exposure among HMO members. *Am J Ind Med* 1998; 33(1):1–10.
5. Arnaiz NO, Kaufman JD. New developments in work-related asthma. *Clin Chest Med* 2002; 23(4):737–47.
6. Cartier A. Diagnosing occupational asthma. *J World Allergy Org* 2003; 15(5):197–201.
7. Chan-Yeung M, Malo J. Occupational asthma. *The N Engl J Med* July 1995; 333(2):107–12.
8. Tarlo S, Liss G. Occupational asthma: an approach to diagnosis and management. *Can Med Assoc J* April 2003;168(7).
9. Bello D, et al. Skin exposure to isocyanates: Reasons for concern. *Env Health Persp* March 2007;115(3) 328–35.
10. Haz-Map. OA Chemicals, revised February 08, 2004 <http://www.haz-map.com/OA.htm>.
11. Haz-Map. OA Biologicals, revised February 08, 2004 <http://www.haz-map.com/OA2.html>.
12. Haz-Map. OA and ACD: Drugs, revised February 08, 2004 <http://www.haz-map.com/drugs.htm>.
13. Rosenman KD. Cleaning products-related asthma. Obstructive airway disease. *Clin Pulm Med* July 2006 13(4)221–28.
14. Lad T. Occupational asthma in health care professionals. *Occupational Health and Safety News*, September 2003 Stevens Publishing Corporation, Dallas, Texas.
15. Chan-Yeung M. Occupational asthma – the past 50 years. *Can Resp J* Jan/Feb 2004; 11(01): 21–6.
16. Rideout K, et al. Evaluating occupational health risks associated with substitution of high-level disinfectants in hospitals. *University of British Columbia School of Occupational and Environmental Hygiene*. April 2003.
17. Lowell Center for Sustainable Production. Glutaraldehyde control in hospitals. *Sustainable Hospitals*; 2001.
18. Canadian Centre for Occupational Health and Safety. Falling out of glove – Exposure to latex can make protection turn bitter. *Health and Safety Report*, July 2004;2(7).
19. Amr S, Bollinger ME. Latex allergy and occupational asthma in health care workers: Adverse outcomes. *Envir Health Persp* March 2004;112(3): 378–81.
20. Hospitals for a Healthy Environment. H2e.– 10 Step Guide to Green Cleaning Implementation. October 2006.
21. Dewitte JD, Chan-Yeung M, Malo JL. Medicolegal and compensation aspects of occupational asthma. *Eur Respir J* 1994; 7:969–80. Retrieved January 10, 2006, from <http://ajrccm.atsjournals.org/cgi/content/full/167/3/450>.
22. Tarlo S, Liss G. Prevention of occupational asthma—practical implications for occupational physicians. *J of Occup Med* 2007;55(8):558–94.