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Occupational Health Clinics for Ontario Workers Inc.

Work-related Asthma Recognition and Prevention: Metals and Metal-working Fluids

Asthma is a common lung disease that makes breathing difficult. It can affect your ability to work and your overall quality of life. When asthma is not well controlled, it can even threaten your life. If you work with metals (e.g., cutting, grinding, soldering, welding, boring, drilling, and/or turning metal) and metal-working fluids (MWFs), you are potentially at risk for developing work-related asthma (WRA) or hypersensitivity pneumonitis (HP). HP is a lung disease with flu-like symptoms including chills, fever, shortness of breath and a deep cough.

What is Work-related Asthma?

When asthma is caused or triggered by breathing in one or more substances in the workplace, it is called "work-related" asthma (WRA). There are two types of WRA: occupational asthma (OA) and work-aggravated asthma (WAA).

Occupational asthma occurs when a substance at work *causes* the worker's asthma. Both MWFs and metal dusts and fumes can cause OA.

Work-aggravated asthma takes place when a worker already has asthma (pre-existing asthma) and it gets worse because of irritants or other exposures or factors in the workplace. Irritants include dust, smoke, fumes, sprays, and perfumes and scented products. Cold temperatures, dry air or exertion at work can also aggravate asthma.

What are the Symptoms of Work-related Asthma?

People suffering from WRA often do not realize that their symptoms are work related because WRA and regular asthma have the same symptoms. They include any or all of the following:

- cough
- shortness of breath
- wheezing, and
- chest tightness.

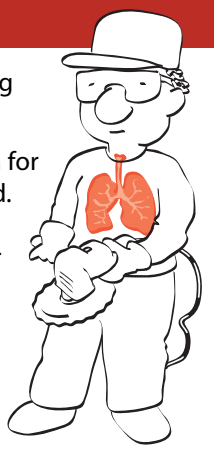
In WRA, the symptoms usually become worse during the working day and throughout the workweek. They usually decrease on days off work such as over the weekend, and during vacations.

If you have these symptoms, go to your doctor and the occupational health or employee health services at work, if there is one. Also, tell your supervisor, union representative and joint health and safety committee (JHSC) if your doctor or your occupational health or employee health staff think that the asthma is possibly work-related.

What Causes Work-related Asthma in People who Work with Metals and Metal-working Fluids?

Metal-working Fluids

MWFs are complex mixtures of ingredients that are used to cool and lubricate metal work pieces when they are being machined. They are also known as machining fluids, coolants, lubricants and cutting oils.



MWFs may remain in the mechanical system for months, or even years, before being replaced. They can become contaminated with bacteria, moulds, dissolved metals and other toxic materials, particularly when the MWF is re-used for a long time.

MWFs create mists as they pass over the work piece. They then drain into a sump and are filtered before being pumped back to the work piece. When workers inhale the mists from MWFs, those who have WAA may find their condition gets worse. In other workers, OA may develop.

The table below lists some of the jobs associated with exposure to MWFs, metal dusts and fumes, and other agents that can cause WRA in people who work with metals.

Table: Some Agents that Cause Work-related Asthma in People who Work with Metals and MWF

Agent	Workers at Highest Risk*
Metal dust and fumes (cobalt, vanadium, chromium, platinum, nickel) MWFs – coolant mists including biocides, microbiologic and other contaminants in the mists of lubricants and coolants Triethanolamine (TEA) Diethanolamine (DEA) Plastic chemicals	Machinists Metal workers (in general) for example, in: • metal parts manufacturing • auto parts manufacturing, and • aircraft parts manufacturing.
Metal dust and fumes, in particular aluminum and zinc chloride fumes Colophony flux	Solderers
Metal dust and fumes, in particular chromium and nickel compounds	Platers and welders
MWFs Colophony flux	Welders
Metal dust and fumes, in particular cobalt Tungsten chloride MWFs	Grinders and hard metal grinders

* Jobs associated with exposure to MWFs and metal dust and fumes include machinists, machinery mechanics, metal workers, tool and die operators, machine operators and setters, workers performing assembly operations of components and labourers who handle components.

How Can Work-related Asthma be Prevented?

WRA in metal workers can largely be prevented by eliminating or reducing exposure to MWFs, metal dusts and fumes, and other agents that are known to cause WRA (see the table) and making sure that MWFs are clean and changed periodically.

Both employers and employees have a role to play in preventing WRA.

Employers should:

- first, try to **eliminate** the asthma-causing agent from the workplace
- if elimination is not possible, **substitute** a less hazardous agent
- when substitution is not possible, **control the exposures** by isolating the areas where MWFs are used, closing off the work processes that release MWFs into the air and installing ventilation systems to capture and contain metal dusts and fumes and MWF mists at the source; provide splash guards to control splashing and misting
- **apply administrative controls** such as policies, procedures, safe work practices, job rotation and minimizing exposure time of workers; select one person, and an alternate, to be responsible for all aspects of MWF use, and set up a maintenance program for checking MWF quality
- **provide personal protective equipment** (PPE) to employees and training on the proper use, storage and maintenance of this equipment; PPE is the last line of defence, to be used only when exposures cannot be prevented or significantly reduced by elimination, substitution and control
- **train employees** on safe working and housekeeping procedures related to working with MWFs (e.g., mixing MWFs, keeping MWFs clean, maintaining proper chemical balance and proper cleaning of machines)
- **monitor the exposure level** of hazardous agents in the workplace, such as MWFs and metal fumes and dust, to make sure that workers are not at risk, and
- inform employees about potential workplace hazards and provide proper training; seek advice from occupational health professionals on how to **recognize, evaluate and control workplace hazards** and their health effects; provide education and information to employees on WRA and its control measures.

Employees should:

- **learn about hazards** in the workplace by speaking to the health and safety representative, an occupational health professional (e.g., nurse or doctor from your occupational health or employee health department) or the employer
- **attend training courses** provided on WRA
- **follow safe work practices**, policies and procedures provided by the employer
- **use the PPE** provided
- **report any changes** in MWFs, such as a change in colour, odour, floating matter on the surface or excessive foam
- **report any problems** with equipment, PPE or ventilation systems, and
- **participate** in all health and safety programs in the workplace (e.g., related to MWFs).

What Should I do if I Have Trouble Breathing?

Act right away if you have symptoms of WRA:

- make an appointment with your family doctor
- tell your doctor your symptoms, where you work, what your job is and what chemicals and materials you work with every day
- take this fact sheet to your doctor, and
- ask for help from a health care professional with expertise in WRA (e.g., a respiratory physician, an allergist or an occupational health doctor or nurse).

If your asthma started while you were working and seems worse at work, it is especially important to have specialized tests arranged to determine whether you have OA.

If your doctor tells you that you have WRA, report to your supervisor right away. In addition, inform your JHSC representative, union representative or an injured worker group.

Anyone who has WRA needs ongoing protection from asthma-causing agents or triggers at work, even if the asthma is controlled with medications. Steps can be taken to remove the worker from the exposure, such as changing the worker's duties within the current job, or changing jobs within the workplace. In some cases, it may be necessary for the worker to leave the workplace, especially if he or she has OA.

WRA is a serious illness. If you do not get treatment and if the exposure is not reduced, it may cause permanent disability. Early recognition and treatment are very important to prevent this illness from getting worse.

For more information, contact:

- IAPA: http://www.iapa.ca, 1-800-406-IAPA (4272) (tel.), or 1-800-316-IAPA (4272) (fax)
- Occupational Health Clinics for Ontario Workers: www.ohcow.on.ca or 1-877-817-0336
- The Lung Association's Asthma Action Helpline: 1-800-668-7682
- The Lung Association: www.on.lung.ca or 1-888-566-5864
- The Asthma Society of Canada: www.asthma.ca or 1-866-787-4050
- Workplace Safety & Insurance Board: www.wsib.ca or 1-800-465-5606
- Ministry of Labour health and safety information: www.labour.gov.on.ca/english/hs/index.html or 1-800-268-8013
- Workers Health and Safety Centre: www.whsc.on.ca or 1-888-869-7950

Contact the Occupational Health Clinics for Ontario Workers or Industrial Accident Prevention Association for the companion brochure, *Work-related Asthma and You: Preventing Work-related Asthma from Metal-working Fluids and Metal Dusts and Fumes*, which accompanies this fact sheet.

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This fact sheet is provided for general information purposes only. For further information, consult a doctor or other health care professional. The information provided in this fact sheet has been developed by IAPA and OHCOW and does not necessarily reflect the policies or positions of the Government of Ontario.