



**WHMIS 2015**

**Workplace Hazardous  
Information System**

**Health PEI**



# WHIMIS: Why Should I Learn About It?

- Everyone who works with or may come into contact with hazardous materials at work.
- Environmental services when they use any chemicals to clean floors, walls.
- Nursing staff cleaning tubs before each use.
- Office staff when cleaning their office space,
- Lab workers when working with various chemicals and products,
- Doctors when dealing with treatment specific chemicals they can come in contact with at the workplace.

# WHIMIS: Why Should I Learn About It? (Cont.)

- ❖ Some common examples of workplace hazardous products include certain cleaning products, degreasers, fire extinguishers, lubricants, chlorine, gasoline and propane.
- ❖ Employers must educate and train workers, so they understand the hazards and know how to work safely with hazardous products.





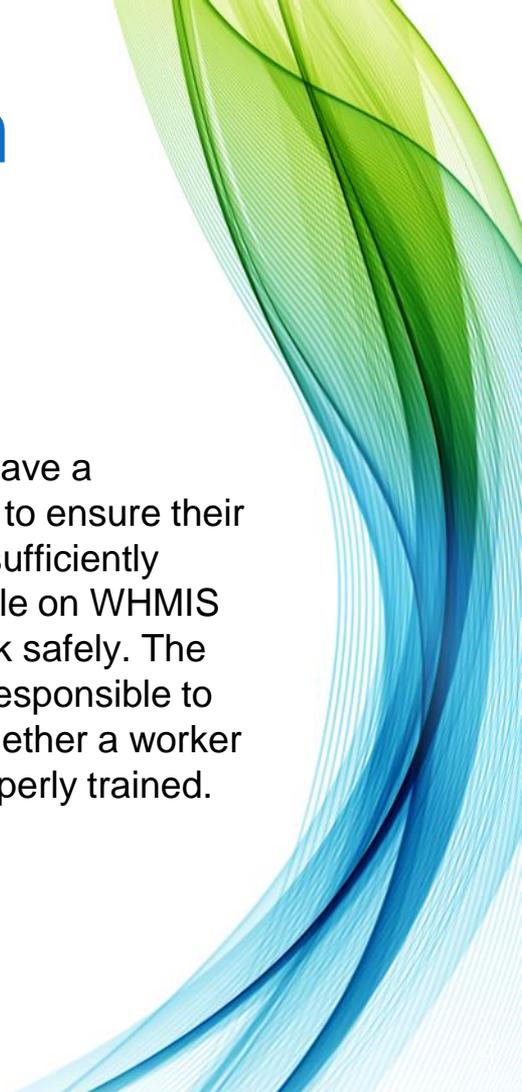
# WHMIS: Why Should I Learn About It? (Cont.)

The **PEI WHMIS Regulations** require employers to inform, educate and train workers who "*work with a hazardous product or may be exposed to a hazardous product in the course of the worker's activities.*"

**Education** is often covered through a general WHMIS course where a certificate is issued.

**Training** refers to the site and job specific information to employees that will cover your workplace's procedures for storage, handling, use, disposal, emergencies, spills and what to do in unusual situations.

**Employers** have a responsibility to ensure their workers are sufficiently knowledgeable on WHMIS to do the work safely. The employer is responsible to determine whether a worker has been properly trained.



Workers should be able to answer the questions below for every hazardous product they work with:

- ❑ What are the hazards of the product?
- ❑ How do I protect myself from those hazards?
- ❑ What do I do in case of an emergency?
- ❑ Where can I get further information?



*If the worker is unable to answer these questions, it may be an indication that the worker does not fully comprehend the education and training provided and may be required to attend the training again.*

# Who Is Responsible For WHMIS



Health Canada is the government body responsible for the overall WHMIS supplier-related laws. WHMIS is also regulated in the workplace by the provinces, territories and federal (for federally regulated workplaces) governments under their occupational health and safety legislation. The province or territory determines the WHMIS education and training requirements. While these jurisdictions based their WHMIS regulations on the common model, small variations between jurisdictions may exist.



# What Is WHMIS?

WHMIS stands for the Workplace Hazardous Materials Information System. It is a comprehensive system for providing health and safety information on hazardous products intended for use, handling, or storage in Canadian workplaces.

WHMIS has aligned with the worldwide hazard communication system known as GHS - the Globally Harmonized System of Classification and Labelling of Chemicals.

Aligning with GHS provides many benefits, including:

- More comprehensive hazard classification which improves ability to indicate severity of hazards.
- Standardized language (hazard and precautionary statements).
- Standardized SDS format and more comprehensive requirements.

# What Is WHMIS? (Cont.)



- Physical hazard criteria are consistent with the Transport of Dangerous Goods (TDG regulations).
- Suppliers and employers must use and follow the WHMIS requirements for labels and safety data sheets (SDSs) for hazardous products sold, distributed, or imported into Canada.

## What are the Main Parts of WHMIS?

- The main components of WHMIS are hazard identification and product classification, labelling, safety data sheets, and worker education and training.

# What Is WHMIS? (Cont.)



## Is WHMIS law?

- Yes. WHMIS first became law in 1988 through a series of complementary federal, provincial and territorial legislation and regulations. This original system was identified as WHMIS 1988. Currently WHMIS 2015.

## What are the Suppliers' Duties Under WHMIS?

- Suppliers must ensure the appropriate classification of hazardous products. This classification is determined based on comparison of all available hazard data for the substances, mixtures, or ingredients to the WHMIS requirements as outlined in the Hazardous Products Regulations.
- When a product is considered to be a "hazardous product", the supplier must label the product or container and they must provide a safety data sheet (SDS) to their customers. The purpose of the label is to clearly identify the hazardous product, the supplier, the hazards and precautionary measures. The SDS provides more information about that product.

# What Is WHMIS? (Cont.)



## What are the Employers' Duties Under WHMIS?

When a hazardous product is used in the workplace, employers are required to:

- Educate and train workers on the hazards and safe use of products.
- Ensure that hazardous products are properly labelled.
- Prepare workplace labels, as needed.
- Prepare SDSs, as necessary (e.g., if an employer manufactures a hazardous product that is used on-site).
- Provide access to up-to-date SDSs to workers.
- Ensure appropriate control measures are in place to protect the health and safety of workers.

# What Is WHMIS? (Cont.)



## What are the Workers Duties Under WHMIS?

- Workers must participate in WHMIS education and training programs, take necessary steps to protect themselves and their co-workers, and participate in identifying and controlling hazards.

## Who Enforces WHMIS?

- WHMIS requirements are implemented through coordinated and interlocking Health Canada and federal, provincial and territorial occupational health and safety laws. WHMIS is enforced by the provincial or territorial government departments or agencies responsible for health and safety, or by the Labour Program for federally regulated workplaces.

# What Is WHMIS? (Cont.)



## How often do I need WHMIS training?

- The legislation states that the WHMIS program must be reviewed annually. This does not mean everyone has to be retrained every year. A good rule of thumb is to be retrained every three years. If the hazardous products used at your workplace change or there is a change in the procedures on how to use, store or handle the hazardous products, you must be retrained in the changes.

*\*If you change employers, the new employer will likely retrain you to ensure you are up to date with WHMIS.*



# Effects Of Chemicals On The Body



Some exposure to chemicals may result in immediate injuries such as chemical burns, while some exposure takes a toll over time. If repeated over the years of employment, even relatively minor chemical exposures can lead to life-changing medical conditions.

## **What are common injuries due to chemical exposure in the workplace?**

Harmful chemicals and substances in the workplace are responsible for many chronic illnesses and deaths that can be untraceable. This is due to the symptoms appearing after many years after the exposure instead of suddenly.

# Effects Of Chemicals On The Body (Cont.)

Other common injuries due to chemical exposure include:

- Burns
- Rashes
- Throat
- Lung Injuries
- Nerve
- Neurological Injuries

How Chemicals Enter the Body

inhalation

**Inhalation.** Hazardous chemicals in the air can be breathed in and can cause harm to the body.

**Skin contact.** Some hazardous chemicals injure the skin directly, or can be absorbed into the body through skin.

**Eye contact.** Contact with some hazardous chemicals can cause injury to the eyes.

**Ingestion.** Hazardous chemicals can enter the body by eating or drinking food contaminated by chemicals.

**Injection.** Sharp objects can puncture the skin and inject chemicals or viruses into the body.

Hazardous chemicals may be harmful to your health. Understand the hazards and take precautions to protect yourself.

# Tips To Help Prevent Chemical Exposure

- Substitute irritating workplace substances with more skin-friendly substances.
- Implement technical measures to reduce skin contact, such as capsuling machinery to avoid splashes on the skin.
- Rotate job positions among employees to limit more intense exposure to harsh environments.
- Wear personal protective equipment such as gloves and masks to prevent skin contact.



# Tips To Help Prevent Chemical Exposure: **Asbestos**

After discovering long-term asbestos exposure has lasting effects on the human body, The Centre for Occupational Health and Safety implemented rules that restrict chemical exposure at work. These rules regulate a number of chemicals that can be present in the workplace and provide employers with guidelines for training new employees.

## The Effects of Asbestos Exposure

### ESOPHAGUS

Asbestos can cause esophageal cancer when fibers are inhaled or swallowed.

### NOSE AND MOUTH

Asbestos fibers can be inhaled through the nose and mouth or swallowed when eating or drinking.

### LARYNX

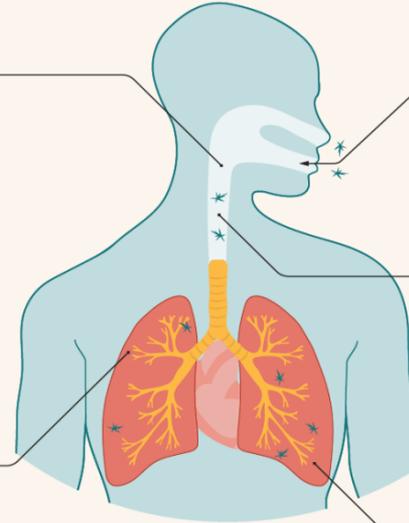
Cancer of the larynx, or voice box, can also be caused by long-term asbestos exposure.

### PLEURAL MEMBRANE

Asbestos exposure can cause scar tissue or cancer to form in the lining of the lungs, constricting them and making it very difficult or painful to breathe.

### LUNG TISSUE

Exposure to asbestos is a known cause of lung cancers, specifically mesothelioma.



# How Many Hazard Pictograms Are There In WHMIS?

	<b>Exploding bomb</b> (for explosion or reactivity hazards)		<b>Flame</b> (for fire hazards)		<b>Flame over circle</b> (for oxidizing hazards)
	<b>Gas cylinder</b> (for gases under pressure)		<b>Corrosion</b> (for corrosive damage to metals, as well as skin, eyes)		<b>Skull and Crossbones</b> (can cause death or toxicity with short exposure to small amounts)
	<b>Health hazard</b> (may cause or suspected of causing serious health effects)		<b>Exclamation mark</b> (may cause less serious health effects or damage the ozone layer*)		<b>Environment*</b> (may cause damage to the aquatic environment)
	<b>Biohazardous Infectious Materials</b> (for organisms or toxins that can cause diseases in people or animals)				

\* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

# Tips To Help Prevent Chemical Exposure (Cont.)

## Labels and Other Identifiers

Under WHMIS 2015, hazardous products used, handled or stored in the workplace must be labelled. Labels are the first alert to users about the major hazards of these products. They also outline the basic precautions or safety.

## Steps that Should be Taken

Suppliers are responsible for labelling the hazardous products that they provide to customers. Employers are responsible for ensuring the hazardous products that come into the workplace are labelled correctly and applied when appropriate.



# WHMIS: Supplier Label

A supplier is a business or individual who does any of the following in the course of business:

- Manufacture, sell or distribute hazardous products in Canada; or
- Import hazardous products into Canada.

Suppliers must ensure hazardous products are properly classified and labelled and up-to-date SDSs are provided. All suppliers (manufacturers, importers, and distributors) must provide information in compliance with WHMIS 2015 by September 1, 2018.

Example of a supplier label:

## Product K1 / Produit K1



### Danger

Fatal if swallowed.  
Causes skin irritation.

#### Precautions:

Wear protective gloves.  
Wash hands thoroughly after handling.  
Do not eat, drink or smoke when using this product.

Store locked up.  
Dispose of contents/containers in accordance with local regulations.

IF ON SKIN: Wash with plenty of water.  
If skin irritation occurs: Get medical advice or attention.  
Take off contaminated clothing and wash it before reuse.  
IF SWALLOWED: Immediately call a POISON CENTRE or doctor.  
Rinse mouth.

### Danger

Mortel en cas d'ingestion.  
Provoque une irritation cutanée.

#### Conseils :

Porter des gants de protection.  
Se laver les mains soigneusement après manipulation.  
Ne pas manger, boire ou fumer en manipulant ce produit.

Garder sous clef.  
Éliminer le contenu/récipient conformément aux règlements locaux en vigueur.

EN CAS DE CONTACT AVEC LA PEAU : Laver abondamment à l'eau.  
En cas d'irritation cutanée : Demander un avis médical/consulter un médecin.  
Enlever les vêtements contaminés et les laver avant réutilisation.  
EN CAS D'INGESTION : Appeler immédiatement un CENTRE ANTIPOISON ou un médecin.  
Rincer la bouche.

Compagnie XYZ, 123 rue Machin St, Mytown, ON, N0N 0N0 (123) 456-7890

# WHMIS: Supplier Label (Cont.)

## A supplier label must be:

- Clearly and prominently displayed on the container and easy to read
- In contrast with other information on the product or container
- Bilingual (as one label or two) If an employer receives a hazardous product where the supplier label does not have both official languages (English and French), it may not be from a Canadian supplier.

If the product is being re-sold or distributed, the employer must then attach a supplier label that is bilingual and meets all the requirements as noted above, in accordance with the Hazardous Products Regulations.

## Product K1 / Produit K1



### Danger

Fatal if swallowed.  
Causes skin irritation.

#### Precautions:

Wear protective gloves.  
Wash hands thoroughly after handling.  
Do not eat, drink or smoke when using this product.

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# WHMIS: Supplier Label (Cont.)

If the product is not being re-sold or distributed but is being used at the workplace, the employer may then affix a workplace label (see section below on workplace labels). The employer must ensure that until a supplier container is empty, the supplier label must not be deliberately removed, destroyed or changed.

If the supplier label is accidentally removed or can no longer be read, then the employer must replace it. When replacing the original supplier label, the employer may either use a new supplier label, if there are extras on hand, or the employer may make a workplace label.

Future updates to supplier labels need to be updated when the supplier becomes aware of any “Significant new data.” Section 5.12(1) of the Hazardous Products Regulations defines significant new data as:

## Product K1 / Produit K1



### Danger

Fatal if swallowed.  
Causes skin irritation.

#### Precautions:

Wear protective gloves.  
Wash hands thoroughly after handling.  
Do not eat, drink or smoke when using this product.

Store locked up.  
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Rinse mouth.

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# WHMIS: Supplier Label (Cont.)

New data regarding the hazard presented by a hazardous product that changes its classification in a category or subcategory of a hazard class, or result in its classification in another hazard class, or change the ways to protect against the hazard presented by the hazardous product." When significant new data becomes known, labels need to be updated by the supplier within 180 days of the supplier being made aware of the new information.

If an employer purchases a product from a supplier within this 180-day time period, the supplier must inform the employer of the changes, and the date they become available, in writing. The employer will then need to receive an updated label from the supplier.

## Product K1 / Produit K1



### Danger

Fatal if swallowed.  
Causes skin irritation.

#### Precautions:

Wear protective gloves.  
Wash hands thoroughly after handling.  
Do not eat, drink or smoke when using this product.

Store locked up.  
Dispose of contents/containers in accordance with local regulations.

IF ON SKIN: Wash with plenty of water.  
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Take off contaminated clothing and wash it before reuse.  
IF SWALLOWED: Immediately call a POISON CENTRE or doctor.  
Rinse mouth.

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Rincer la bouche.

# WHMIS: Workplace Label

The workplace label is a label the employer produces. It is not as specific as the supplier label. A workplace label is required where: A supplier label becomes hard to read or is removed (the employer may replace the damaged or missing supplier label with another supplier label OR a workplace label).

## Example of a workplace label

CHEMICAL NAME / PRODUCT NAME		<i>See Safety Data Sheet</i>	
SIGNAL WORD Use Only One			
<input type="checkbox"/> <b>DANGER</b>		<input type="checkbox"/> <b>WARNING</b>	
	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>
HAZARD STATEMENT			
PRECAUTIONARY STATEMENT			
reorder: NUTRONUSA 440.777.6660		GH55x6	

A hazardous product is imported directly to the workplace and either has no supplier label or has one that does not meet requirements of the Hazardous Products Regulations AND the product is only being used at the workplace (if it is being sold or distributed then a supplier label is required).

A hazardous product is produced at the workplace (unless the product produced is a fugitive emission or is one that intended to be for sale or distribution; then no workplace label is required).

A hazardous product is decanted (transferred) into another workplace container (unless the product is decanted into a portable container that is immediately used or is under the exclusive use and control of a worker during that worker's shift; then only an identifier is required but no workplace label is needed).

In this case, it is still good practice to label the portable container in case the worker goes on break or otherwise leaves it unattended by mistake.

# WHMIS: Workplace Label (Cont.)

The workplace label must do all of the following:

- Identify the product
- Provide information for the safe handling of the product
- Indicate the safety data sheet is available

The workplace label requires no specific wording or format. Requirements are deliberately broad and general.

However, in spite of the flexibility given to the employer under these regulations, There are some expectations as what constitutes an acceptable workplace label.

## Safety Data Sheets

Safety Data Sheets (SDSs) are documents that provide information about hazardous products and advice about safety precautions. An SDS tells you what the hazards of a product are, how to use the product safely, what to expect if the recommendations are not followed, how to recognize symptoms of exposure, and what to do if emergencies occur.

# Safety Data Sheets

SDSs provide more detailed hazard information about products than labels do. SDSs are important resources that help you learn more about the products you use.

Use this information to identify:

- The hazards of the products you use
- How to protect yourself from those hazards
- Safe handling and emergency measures.

SDSs are usually prepared or obtained by the manufacturer or importer of a product.

Example of an SDS:

SIGMA-ALDRICH

sigma-aldrich.com

Material Safety Data Sheet

Version 4.1  
Revision Date 10/23/2010  
Print Date 02/08/2011

## 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	: Chromium(III) acetate hydroxide	
Product Number	: 318108	
Brand	: Aldrich	
Product Use	: For laboratory research purposes.	
Supplier	: Sigma-Aldrich Canada, Ltd 2149 Winston Park Drive OAKVILLE ON L6H 6J8 CANADA	Manufacturer : Sigma-Aldrich Corporation 3050 Spruce St. St. Louis, Missouri 63103 USA
Telephone	: +19058298500	
Fax	: +19058299292	
Emergency Phone # (For both supplier and manufacturer)	: 1-800-424-9300	
Preparation Information	: Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956	

## 2. HAZARDS IDENTIFICATION

### Emergency Overview

#### WHMIS Classification

Not WHMIS controlled. Not WHMIS controlled.

#### GHS Classification

Acute toxicity, Inhalation (Category 4)  
Acute toxicity, Dermal (Category 4)  
Acute toxicity, Oral (Category 4)  
Skin irritation (Category 2)  
Eye irritation (Category 2A)  
Specific target organ toxicity - single exposure (Category 3)

#### GHS Label elements, including precautionary statements

Pictogram



Signal word Warning

Hazard statement(s)

H302 + H312 Harmful if swallowed or in contact with skin.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H332 Harmful if inhaled.  
H335 May cause respiratory irritation.

Precautionary statement(s)

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P280 Wear protective gloves/ eye protection/ face protection.  
P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.

# Safety Data Sheets (Cont.)



SDSs are required to be accurate at the time of sale. If the manufacturer is in another country, the SDS must be developed by the Canadian importer if that importer wants to supply or distribute the product. The first section of the SDS by a supplier must identify the Canadian supplier. If the product is only for use in the importer's own workplace, however, the manufacturer's SDS is acceptable.

While SDSs have a standard 16-section format to make it easier to quickly find the information that is needed, workers may find some of the information on an SDS difficult to understand because of language barriers or because of the level of technical wording used on an SDS. Employers must be able to explain the content of the SDS to workers in order for them to work safely with or near hazardous products, and workers must be able to demonstrate understanding of the information.

Every SDS must provide a date of last revision in Section 16 Other Information. You will know if an SDS has been updated by checking this date and comparing it to the one on any previous SDS you have.

**Availability of Safety Data Sheets** The employer must ensure that SDSs are readily available to each worker who works with the hazardous product or who may be exposed to the hazardous product, and also to the Joint Occupational Health and Safety Committee or Health and Safety Representative.

It is common practice to print all SDSs and keep them in a binder or folder close by and accessible to the workers. It is not acceptable to keep them stored in an area that is too far from workers or in a locked area inaccessible to workers.

# Exposure Controls & Personal Protective Equipment

## HAZARDOUS CHEMICAL ROUTES OF ENTRY

### Inhalation

Do we breathe it in? This is the most common route of entry.



### Absorption

Does it pass through the skin, eyes or other membranes?

### Ingestion

Do we eat or drink it?

### Injection

Does it enter through a puncture or cut?

A hazardous product can affect a worker in different ways, depending on how the worker comes in contact with the product.

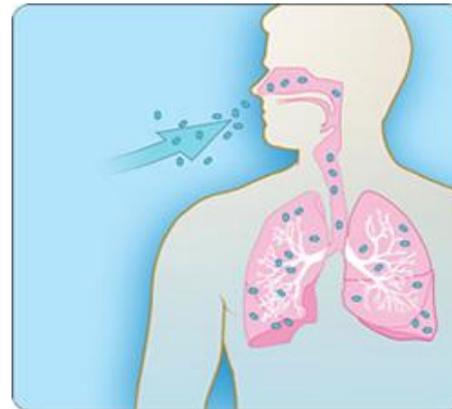
How a chemical gets into the worker's body is the "route of entry" and includes the following:

- Inhalation (breathing)
- Skin (or eye) contact
- Swallowing (ingestion or eating)
- Injection (skin penetration)

# Exposure Controls & Personal Protective Equipment

Breathing in contaminated air is the most common way that workplace chemicals enter the body. Some chemicals, when contacted, can pass through the skin into the bloodstream. The eyes may also be a route of entry. Usually, however, only very small quantities of chemicals in the workplace enter the body through the eyes. Workplace chemicals may be swallowed unintentionally if contaminated hands are not washed before the worker touches food or cigarettes, or if the items are contaminated directly. For this reason, workers should not drink, eat, or smoke in areas where they may be exposed to chemicals.

Regardless of the way the chemical gets into the body, once it is in the body, it is distributed in the body by the bloodstream. In this way, the chemical may harm organs which are far away from the original point of entry as well as where they entered the body.



# How Are Chemicals Inhaled?

## Gases and Vapours

Workplace chemicals can enter the air in a number of different ways. Simple evaporation is probably the most common way. Organic solvents, such as [toluene, methyl ethyl ketone](#) (MEK), or alcohols, generally evaporate more rapidly than water, acids, or bases, although this situation is not always the case. Evaporation produces vapours. Vapours are formed from products that exist as solids or liquids under normal temperature and pressure conditions. Products that do not exist as solids or liquids at normal temperatures and pressures are called gases. Gases, as well as vapours, can contaminate the workplace air.

## Mists

In some instances, an industrial process might produce tiny liquid droplets that are able to float in the air. These droplets are called mists. Mists are formed by gases that condense into small liquid droplets in the air. Alternatively, mists may form by breaking up, splashing, or atomizing a liquid. Examples include acid mists from electroplating, oil mists from cutting and grinding, or paint spray mists from painting operations.

# How Are Chemicals Inhaled? (Cont.)

## Dusts, Fumes and Smoke

Other workplace processes can generate tiny solid particles which are light enough to float in the air, and these particles are referred to as dusts, fumes and smoke. Dusts are solid particles often generated by some mechanical or abrasive activity. They are usually heavy enough to settle slowly to the ground. Fumes are very tiny solid particles which can remain airborne, and are formed when a heated metal has evaporated in the air and then condensed back to a solid form. Fumes can occur in welding operations. Smoke is carbon or soot from burning. Smoke particles can settle or remain airborne depending on their size.



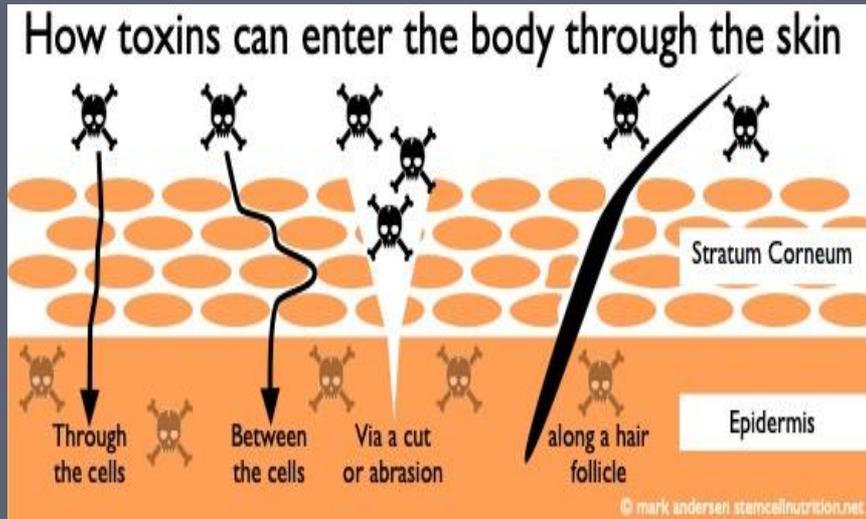
# How Can A Chemical Enter My Body Through The Skin?

The skin is the second most common route by which occupational chemicals enter the body. Chemicals which pass through the skin are nearly always in liquid form. Solid chemicals and gases or vapours do not generally pass through the skin unless they are first dissolved in moisture on the skin's surface.

The skin consists essentially of two layers, a thin, outermost layer called the epidermis and a much thicker underlayer called the dermis. The epidermis consists of several layers of flat, rather tightly-packed cells which form a barrier against infections, water, and some chemicals. This barrier is the external part of the epidermis. It is called the keratin layer and is largely responsible for resisting water entry into the body. It can also resist weak acids but is much less effective against organic and some inorganic chemicals. The keratin layer contains fat and fat-like substances which readily absorb chemicals which are solvents for fat, oil, and grease.



# How Can A Chemical Enter My Body Through The Skin? (Cont.)



Organic and alkaline chemicals can soften the keratin cells in the skin and pass-through this layer to the dermis, where they are able to enter the bloodstream. Areas of the body such as the forearms, which may be particularly hairy, are most easily penetrated by chemicals since they can enter down the small duct containing the hair shaft. Chemicals can also enter through cuts, punctures or scrapes of the skin since these are breaks in the protective layer. Contact with some chemicals such as detergents or organic solvents can cause skin dryness and cracking. There can also be hives, ulcerations or skin flaking. All these conditions weaken the protective layer of the skin and may allow chemicals to enter the body.

Chemicals can vary enormously in the degree to which they penetrate the skin. Some solvents may soften the keratin layer but are not believed to penetrate much further unless there is prolonged skin contact. Other chemicals can readily pass through the epidermis and subsequently enter the bloodstream. Some chemicals are so corrosive they burn holes in the skin, allowing entry for infection or other chemicals.

# How Can Chemicals Enter My Body Through My Eye(s)?

Although eye splashes or eye contamination by workplace chemicals is fairly common, chemicals usually do not enter the body this way. Small amounts of chemicals may enter by dissolving in the liquid surrounding the eyes, and larger, but probably not significant amounts, may enter the eyes if they are splashed with chemicals.

The eyes are richly supplied with blood vessels and many chemicals can penetrate the outer tissues and pass into the veins. The eye may or may not be damaged during this process, depending on the corrosive nature of the chemical and its ability to penetrate the outer tissues.

An infographic with a blue background. At the top, the words "CHEMICAL SPLASH" are written in large, bold, yellow capital letters. Below this, there are three bullet points, each starting with a yellow starburst icon. The first bullet point says "Corrosive chemicals can cause serious eye injury." The second says "If there is a risk of splash, use chemical splash goggles." The third says "Do not work alone when you face a corrosive chemical splash risk." To the right of the text is a stylized orange silhouette of a person's head wearing white safety goggles. A yellow splash of liquid is shown at the bottom right, appearing to hit the person's face. At the bottom of the infographic, there is a white horizontal bar. On the left side of this bar is a small orange square with a white letter 'T' inside, followed by the text "ENVIRONMENTAL HEALTH & SAFETY" in black. On the right side of the bar, the text "SAFETY BEGINS BETWEEN THE EARS" is written in bold black capital letters.

**CHEMICAL SPLASH**

- ✦ **Corrosive chemicals can cause serious eye injury.**
- ✦ **If there is a risk of splash, use chemical splash goggles.**
- ✦ **Do not work alone when you face a corrosive chemical splash risk.**

**T** ENVIRONMENTAL HEALTH & SAFETY **SAFETY BEGINS BETWEEN THE EARS**

# How Are Chemicals Swallowed (Ingested)?

Chemicals can enter the stomach either by swallowing contaminated mucus which has been expelled from the lungs, or by eating and drinking contaminated food. Food and drink are most frequently contaminated by contact with unwashed hands, gloves or clothing, or by being left exposed in the workplace. Nail-biting and smoking can also contribute to exposure.

Once inside the mouth, chemicals pass down the esophagus and then into the stomach. Some chemicals, such as alcohols, may pass across the stomach wall and enter the bloodstream here, but most chemicals move from the stomach into a long, twisting tube known as the small intestine. The inside of the small intestine has many hundreds of tiny finger-like projections called villi. The villi have very thin walls and are filled with tiny blood vessels. This formation allows some ingested chemicals to pass from the small intestine across the walls of the villi and enter the veins. The chemical is then carried around the body by the bloodstream. Some chemicals, which are not soluble or whose basic units (molecules) are too big to pass across the villi walls, will stay in the gut and pass out of the body in the feces without being absorbed into the bloodstream to any extent. Some acids, bases and organics may cause severe "burn" damage to the digestive system if swallowed in high concentrations.

# What Happens When The Skin Is Penetrated?

Injection is the fourth way chemicals may enter the body. While uncommon in most workplaces, it can occur when a sharp object (e.g., needle) punctures the skin and injects a chemical (or virus) directly into the bloodstream.

In some instances, chemicals may enter the body by unintentional injection through the skin. This situation may occur in hospital settings (e.g., needlestick injuries) or in industrial hole-punching or injection processes. Once in the bloodstream, these chemicals can be transported to any site or organ of the body where they may exert their effects.



# What Happens When The Skin Is Penetrated? (Cont.)

Some products can have short-term effects (rash or burn on the skin), while other effects are more long term (cancer or liver/kidney damage), depending on how toxic it is or how often or how large a dose to which a worker is exposed. Workers need to know how to protect themselves from exposure to a hazardous product. This information can always be found in Section 8 of a Safety Data Sheet. While it is always best to control the hazard from ever reaching the worker (such as improving ventilation or putting up barriers), many times it is only possible to have the worker wear personal protective equipment (PPE).



# Types Of PPE

The type of PPE needed depends on how the product is used. This information will be found on the SDS and on the label. The employer must ensure the worker is trained on the proper care, selection and use of the PPE for the hazardous products being handled.



# Types Of PPE

## Protective Clothing

This may include gloves, an apron, boots or a full body suit. It is important to know the correct type of material to use. For example, gloves can be made from neoprene, latex, nitrile, etc., which all protect your skin differently depending on the nature of the product being handled. Long sleeves may be sufficient in some cases, but long gloves may be required in others. **Always check the SDS when in doubt.**

## BASIC ELEMENTS OF PPE



# Types Of PPE

## Eye Protection

Depending on the hazardous product that is being handled, the worker may need different types of eye protection, ranging from chemical splash goggles to a full-face shield.

Workers who wear contact lenses must notify the employer especially if they are working with substances that may cause more harm to the eyes while wearing them (see s. 45.9 and 45.10 of the OHS General Regulations for PEI).



Class 1A - Spectacle-type with side protection



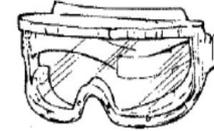
Class 1B - Spectacle-type with side and radiation protection



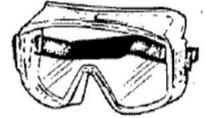
Class 2A - Direct ventilated goggles



Class 2B - Non-ventilated goggles



Class 2C - Direct/non-ventilated goggles with radiation protection



**Several different types of safety eyewear shown - always check the SDS to determine the best eyewear for the product used.**

# Respiratory Protection

## Selecting the Correct Respirator is Important

A proper respirator with a proper seal will ensure the worker is not breathing in a hazardous product. A proper sealing fit to the skin is especially important for respirators, which means workers with facial hair will need clean shaven skin in order to have a proper seal. Even a day's growth of facial hair can be sufficient to allow a hazardous product to leak in under a good-quality respirator, rendering it ineffective. Respirators must be maintained in good operating condition if they are to be effective. Leaving a respirator out in a dusty environment, for example, can render it ineffective for the next use.



Half Mask,  
Particulate



Half Mask,  
Dual Cartridge  
Disposable



Half Mask,  
Dual Cartridge  
Reusable



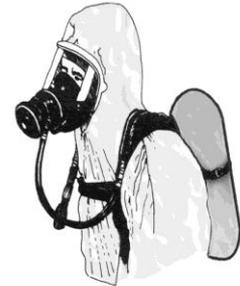
Full-Face  
Dual Cartridge  
Reusable



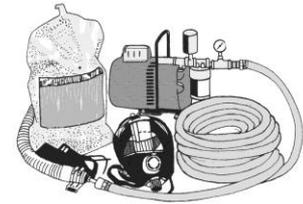
Canister Type  
Gas Mask



Powered air Purifying  
Respirator (PAPR)



Self Contained Breathing Apparatus (SCBA)



Continuous Flow Supplied Air Respirator

**Different styles of respirators:**

**Be sure to again consult the SDS for reference to which respirator to use.**

# PPE Maintenance

The maintenance should follow the manufacturer's instructions and include the following:

- How to clean and disinfect (unless it is a disposable product)
- How to inspect and keep in good condition
- How to store properly
- How to replace damaged/deteriorated parts
- How to get a proper fit

**Keep in mind that PPE protects only the user** - it does nothing to remove the hazard from the workplace. For example, a respirator may help protect the wearer from toxic fumes but does nothing to protect others in the vicinity.

The employer has responsibilities under Part 45 of the OHS General Regulations with respect to PPE.

## **The Employer:**

- Must ensure the wearing of the apparel by workers is of a type and condition that will not expose the worker to unnecessary and avoidable hazards
- Must ensure PPE is maintained in good condition
- Must ensure workers who are required to wear PPE are given pre-job instruction on its use, limitations, and its maintenance requirements

**Additionally, workers who are required to wear PPE are responsible for testing the equipment before each use and must not wear or use any PPE that the worker believes to be defective.**

