

Personal Protective Equipment (PPE) for Respiratory Infectious Diseases (RIDs)



Introduction

This tip sheet provides information about the use of personal protective equipment (PPE) as a hazard control measure in the workplace to help protect workers from respiratory infectious diseases.

Refer to CCOHS' [Designing an Effective PPE Program](#) for additional information about PPE.

Consider the Risks

- Respiratory infectious diseases can spread from person to person through respiratory particles or they can spread by touching contaminated surfaces, especially during close or direct contact with people who are sick. The risk of spreading respiratory infectious diseases increases when people are in small, enclosed spaces with poor ventilation or in crowded places. Risk is further increased where these two situations occur together and involve individuals at higher risk from serious complications, close-range conversations, singing, shouting or heavy breathing
- Each workplace is unique. Employers need to take every reasonable precaution to protect the health and safety of their workers. These precautions include [assessing the risks](#) of respiratory infectious disease transmission in their specific workplace setting. For example, a high-risk work setting such as long-term care facilities or hospitals may require workers to wear additional PPE due to higher transmission risks
- Consider implementing appropriate hazard controls using the [hierarchy of controls](#). PPE should be used with other hazard controls in a layered approach, whenever possible (e.g., increasing indoor air ventilation and filtration, staying home when sick, etc.)

Use of PPE

There are many different types of PPE. This tip sheet focuses on PPE that minimizes workers' exposure to respiratory infectious diseases and other respiratory hazards including:

- Medical masks
- Eye protection (e.g., face shield, goggles)
- Gloves
- Medical gowns
- Respirators

Select PPE based on the type of hazard and the risk of exposure to the worker. PPE requirements may also be specified by your [jurisdiction](#).

Workers may be required to wear PPE when:

- Providing direct care or medical treatment to a person who has a respiratory infectious disease, such as COVID-19
- Using cleaning and disinfecting products

PPE is regulated by government agencies and is required to meet specific performance standards. In Canada, PPE sold for medical purposes are classified as medical devices and must comply with the [Medical Devices Regulations](#). In general, authorization by Health Canada is required before medical devices can be imported and sold.

Non-medical masks are not considered PPE. Individuals should choose the best quality and best fitting masks available to them. For additional information on non-medical masks, refer to the CCOHS resource [Masks for Protection from Respiratory Infectious Diseases](#).

Procedures

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- Develop procedures that describe when, where, and what type of PPE workers are required to use
- Make sure workers are trained on how to select, care, inspect, use, and store PPE
- Outline how and where PPE is available to workers
- Describe cleaning and disinfecting procedures for reusable PPE. PPE should be cleaned and disinfected according to the manufacturer's instructions
- All PPE should be inspected for defects before use. If defective for any reason, the PPE should not be used and a replacement selected
- Outline the steps for putting on (donning) and taking off (doffing) PPE

Respirators

- Particulate filtering respirators are a type of air purifying respirator. They protect the wearer by filtering particles out of the air when they breathe. The different types of particulate filtering respirators are:
 - Filtering facepiece respirators,
 - Elastomeric respirators (half mask or full face) with particulate filtering cartridges, and
 - Powered air purifying respirators with particulate filtering cartridge
- The term "N95", used in an N95 filtering facepiece respirator, describes two features:
 - "N" indicates that the respirator is not resistant to oil
 - "95" refers to the filtration efficiency where at least 95% of particles are filtered
- Medical N95 filtering facepiece respirators are also fluid resistant
- Respirators are evaluated, tested, and certified by agencies approved by Health Canada such as the U.S. National Institute for Occupational Safety and Health (NIOSH). Certified respirators must pass minimum performance requirements, such as fit testing, filter efficiency and breathing resistance
- Make sure workers are fit tested before they are required to wear a tight-fitting respirator. Fit testing verifies that there is an effective seal between the respirator and the worker's face
- Remind workers that they cannot have facial hair that comes between the sealing surface of the tight-fitting respirator facepiece and their face. Facial hair can cause respirators to leak around the face seal
- Wearers should perform a positive and negative user [seal check](#) when they put on a tight-fitting respirator
- Filtering facepiece N95 respirators (or equivalent) may be worn based on the employer's risk assessment, a health care worker's point-of-care risk assessment, if an aerosol generating medical procedure is being performed, or if specified by local requirements
- Refer to [Respirators - Respirators Versus Surgical Masks Versus Non-medical Masks](#) for more on Health Canada approved respirators

Counterfeit Respirators

- Health Canada has issued warnings about counterfeit respirators. These are imitations of legitimate products and may not provide protection
- Below are some signs that a filtering facepiece respirator may be counterfeit:
 - No markings on the respirator
 - NIOSH (or other certifying body identifier) spelled incorrectly
 - No approval numbers
 - Presence of decorative fabric or other decorative add-ons (e.g., sequins)
- NIOSH has identified [counterfeit respirators](#) on their website. They also provide information on how to identify whether a respirator may be counterfeit
- If your respirator is counterfeit, stop using it as it may not help minimize exposure to pathogens that cause respiratory infectious diseases. If your respirator is counterfeit, stop using it as it may not help minimize exposure to pathogens that cause respiratory infectious diseases

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Medical Masks

- Medical masks act as a barrier to respiratory particles and spit. Unlike respirators, they are not designed to filter small particles from the air
- Medical masks are also referred to as surgical or procedural masks
- They consist of three layers. The outer layer is made of a fluid-resistant material, the middle layer contains a filtration medium (polypropylene sheet), and the inner layer absorbs moisture produced by the wearer
- Medical masks are classified by the American Society for Testing and Materials (ASTM) as:
 - Level 1 (low) - venous pressure splash
 - Level 2 (moderate) - arterial pressure splash
 - Level 3 (high) - high-velocity procedures, orthopedic surgery

Eye Protection

- Eye protection protects the eyes from hazards, such as splashes, sprays of blood, or bodily fluids
- They include face shields, goggles, and safety glasses
- Regular prescription eyeglasses are not considered PPE unless they meet specific requirements for protective eyewear
- Eye protection may be used by health care workers who are caring for patients who have a respiratory infectious disease
- Some chemical and disinfecting products are classified by [WHMIS](#) as a health hazard (causing serious eye damage or eye irritation). Workers using these products require eye protection

Gloves

- Gloves act as a barrier that protects the skin from exposure to a hazardous substance
- Medical gloves may be made of latex, vinyl, synthetic polymer, or nitrile
- Some workers may be allergic to the natural rubber latex used in some medical gloves. If workers are allergic, choose a glove made from a different material
- Make sure workers have access to gloves that protect them from hazards found in the workplace including when working with cleaning and disinfecting chemicals. Gloves are made of different materials and one type of glove will not provide protection for all types of chemicals. Review the manufacturer's safe-use instructions or [Safety Data Sheet](#) and select the appropriate type of glove that will protect against the chemical hazard. For additional information, refer to CCOHS' [Chemical Protective Clothing - Glove Selection](#)
- Make sure to provide a selection of glove sizes so each worker has the correct fit. Poorly fitted gloves can reduce dexterity or allow hazards to enter the glove at the wrist
- Inspect all gloves before use. If there is any discoloration, visible holes or tears, the gloves should be discarded and not worn
- After use, carefully remove gloves to prevent skin contact with any contaminants on the outside of the gloves (see 'Doffing PPE' section of this tip sheet for details)

Medical Gowns

- Medical gowns provide a physical barrier between a hazard and the wearer's skin
- Follow the manufacturer's instructions about when to remove and replace a medical gown if it is torn, wet, or soiled
- Medical gowns may be re-useable or disposable
- Medical gowns should have long-sleeves, cover the body front and back from the neck to the thighs, overlap in the back, fasten at the neck and back, and be easy to put on and take off

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- Health Canada recognizes three standards for medical gowns:
 - CSA Group – CSA Z314
 - American National Standards Institute and Association of the Advancement of Medical Instrumentation – ANSI/AAMI PB70
 - European Standards – EN 13795
- Medical gowns are grouped by category and level of risk:
 - Level 1 – minimal risk; used for standard precautions and simple procedures
 - Level 2 – low risk; used for minimally invasive surgery
 - Level 3 – moderate risk; used for open gastrointestinal surgeries
 - Level 4 – high risk; used for open cardiovascular and trauma procedures

Donning PPE

- Identify and gather all the PPE that needs to be worn
- Wash your hands
- The appropriate steps for donning PPE should be tailored to the specific type of PPE. If wearing a medical gown, put it on first. Put arms in sleeves and secure all ties
- To put on a medical mask or respirator:
 - Medical mask ties should be secured on crown of head (top tie) and base of neck (bottom tie). If the mask has ear loops, hook them appropriately around your ears
 - Respirator straps should be placed on crown of head (top strap) and base of neck (bottom strap) or around the ears depending on the model. Perform a user seal check each time you put on the respirator
- Put on the eye protection prior to donning gloves
- Put on gloves last. Gloves should cover the cuff (wrist) of any gown being worn
- If available, ask a co-worker to check your PPE

Doffing PPE

- More than one doffing method or order of steps may be acceptable. Appropriate PPE doffing steps should be outlined in a procedure
- The outside of the PPE may be contaminated. Take care not to touch PPE with your bare hands
- To remove gloves:
 - Grab the outside edge near the wrist of one glove and peel it away, rolling the glove inside out
 - Hold the balled-up glove in your gloved hand
 - Slide two ungloved fingers under your other glove and remove it
 - Drop both gloves into a proper waste container
 - An instructional [video](#) by the Public Health Agency of Canada (PHAC) is available
- To remove gown:
 - Unfasten ties and pull ties forward
 - Peel gown off shoulders and away
 - Turn the contaminated side towards the inside, bundle, and discard
- To remove eye protection:
 - Use the earpieces or straps to pull the eye protection away from your face
 - Clean and disinfect any reusable eye protection before reuse

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- To remove medical mask or respirator:
 - Use the straps or ear loops to remove from the face in a downward direction
- Wash your hands

Heat Stress and PPE

- If workers are required to work in a hot environment and wear PPE, make sure a heat stress control program is implemented. The program should:
 - Use engineering controls (e.g., air conditioning)
 - Monitor environmental conditions and follow the appropriate work-rest schedule
 - Use administrative controls such as scheduling tasks to cooler parts of the day, providing water, increasing the frequency of breaks, etc.
 - Train workers on the signs and symptoms of heat stress
 - Allow the wearing of light and breathable clothing, if possible
 - Support workers as they acclimatize to heat
- The American Conference of Governmental Industrial Hygienists (ACGIH) has a threshold limit value (TLV) for heat stress that is measured in units of WBGT (wet bulb globe temperature) degrees Celsius (°C). The calculation includes a [clothing adjustment factor](#) for various listed clothing types, which may add 0 to 11 °C to the WBGT to account for additional layer of clothing, if present
- The ACGIH does not recommend any adjustment for the use of face coverings and their heat stress TLV does not list a clothing adjustment factor for face masks

For further information on respiratory infectious diseases, including COVID-19, refer to the [Public Health Agency of Canada](#)

Disclaimer: As public and occupational health and safety information may continue to change, local public health authorities should be consulted for specific, regional guidance. This information is not intended to replace medical advice or legislated health and safety obligations. Although every effort is made to ensure the accuracy, currency, and completeness of the information, CCOHS does not guarantee, warrant, represent or undertake that the information provided is correct, accurate or current. CCOHS is not liable for any loss, claim, or demand arising directly or indirectly from any use or reliance upon the information.