



# COVID-19

## **Enhanced Ventilation: *Prudent actions to help control airborne virus transmission***

**Working indoors or in an enclosed environment? Concerned about exposure to the COVID-19 virus? Health and safety law says your employer must take every reasonable precaution to protect you. But what is reasonable in the circumstances?**

According to most experts and public health agencies, transmission of the COVID-19 virus occurs primarily via **inhalation of large respiratory droplets**, generally in the vicinity of an infectious person, or by touching a contaminated surface. Physical distancing, hand hygiene, proper sneeze/cough etiquette, enhanced cleaning and disinfecting protocols and use of face coverings, especially when physical distancing is not possible, are all reasonable and critical precautions to help prevent or reduce chances of transmission.

Debate about airborne transmission of **smaller infectious droplets and aerosols**, however, continues. When speaking, coughing, sneezing and even singing, various size particles are emitted. Some are small enough to travel greater distances and stay airborne much longer than the larger droplets before settling on surfaces. As a result, some experts believe the evidence is sufficient to warrant enhanced ventilation measures among the many ways to reduce transmission of the COVID-19 virus in indoor work environments. After all, when in doubt, the **precautionary principle** should guide all actions. In other words, the absence of scientific certainty should not prevent a prudent response.

**Globally-recognized standards setting organizations**, including the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), concur. ASHRAE has stated, "Transmission of SARS-CoV-2 [the virus that causes COVID-19 disease] through the air is sufficiently likely that airborne exposure to the virus should be controlled."

## MEASURES FOR SAFER, HEALTHIER BUILDING VENTILATION

In addition to ASHRAE, many other organizations, including the U.S. [Centres for Disease Control and Prevention](#) (CDC) and [Occupational Safety and Health Administration](#) (OSHA), have recommended a range of precautionary actions, including measures to help reduce indoor airborne levels of the COVID-19 virus and thus the chance of transmission. **Consider the following:**

- ◆ Assess the heating, ventilation and air conditioning (HVAC) system to ensure it is functioning properly. (Consider duct work and all air purification systems and use a certified technician.)
- ◆ Increase ventilation rate and run ventilation system longer than normal (24/7 if possible).
- ◆ Use high efficiency filtration (minimum value MERV-13 or higher).
- ◆ Ensure filters are within their service life and properly installed.
- ◆ Increase amount of clean outdoor air circulating into the system to reduce or dilute any contaminants.
  - ◆ Minimizing the effect of outdoor air dampers will help achieve this end.
  - ◆ Disabling demand-controlled ventilation so outdoor air intake is not reduced based on occupancy also helps.
  - ◆ Where possible, opening windows and doors to increase intake of outdoor air is beneficial too. (Although, consider external pollutants and any potential functional impacts on the HVAC system.)
- ◆ Ensure exhaust fans in bathrooms, change rooms, break or lunch rooms are operating at full capacity and running continuously.
- ◆ Use ultraviolet germicidal irradiation (UVGI) in the ventilation system where available. (This destroys or inactivates microorganisms.)
- ◆ Use single space air cleaner units, which may employ several air purification technologies, including high efficiency particulate air (HEPA), activated charcoal, and electrostatic filtration systems, as well as ultraviolet irradiation.
- ◆ Ensure relative humidity levels in the workplace are kept between 40 and 60 per cent, if possible.
- ◆ Clean and disinfect all HVAC intakes and returns daily.
- ◆ Ensure air from the breathing zone of one person is not flowing directly into the breathing zone of another. To help accomplish this, consider air flow from general and local exhaust ventilation systems along with windows, doors and fans. Workstations may need to be repositioned accordingly.

**For more information, see the other source documents listed below.**



## HEALTH CARE-SPECIFIC VENTILATION MEASURES

When it comes to health care facilities, even greater care needs to be taken with building ventilation. The role proper ventilation plays in infection control has long been understood. Likely the [most comprehensive document](#) developed for health care settings comes from ASHRAE. Requirements are many and considerably more complex, especially in hospital settings. In the wake of COVID-19, researchers and public health authorities have provided additional guidance for often overlooked health care settings like [long-term care facilities](#) and [dental offices](#). Although the following cannot replace these source documents, here are some important elements, in addition to those listed above, which will benefit everyone's health and safety.

- ◆ Consider establishing airborne infection isolation rooms (AIIR) for infectious residents in long-term care facilities, much as they are used for similar reasons in hospitals. Under slight negative pressure (compared to halls and adjacent rooms), they prevent movement of contaminated air to communal areas and adjacent rooms. Contaminated air needs to be exhausted to the outside. These rooms require at least 12 changes of air per hour, with two of those from outdoor air.
- ◆ Consider increasing air exchange rates in other rooms, such as soiled linen sorting and storage and janitors' closets to 12 air changes per hour as well.
- ◆ Keep infectious patient and resident room doors to hallways closed, if possible.
- ◆ If possible, install in dental and clinic offices for instance, ventilation systems such as those used in hospital emergency rooms, that provide air movement from a clean area (i.e., reception area, workstation) to contaminated area (clinical patient care area).

**N.B.** Wherever possible it is preferable to undertake aerosol generating procedures involving patients (and including dentist offices) in single, well ventilated, negative pressure rooms with closed doors. Following aerosol generating procedures cleaning and disinfection must be performed, but only following a period where the room is left empty with door closed to permit clearance or settling of aerosols. How long the room is left empty will depend on the air exchange rate and how many exchanges include outdoor air. For instance, where there are 12 air changes, two of which are from the outdoors, the room should be left empty for at least 35 minutes.





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## OTHER WHSC COVID-19 RESOURCES

Workers Health & Safety Centre (WHSC) [COVID-19 Training](#) is being **offered virtually online** to ensure access to quality training during these unprecedented times that call for us to practice social (physical) distancing. Training participants will gain essential information about routes of transmission, tell-tale symptoms, relevant legislation and public health directives along with critical insight into control measures to help prevent or reduce chances of infection and transmission.

Our library of [COVID-19 resources](#) is also available online to help ensure workers, supervisors, joint health and safety committee members, health and safety reps and others have ongoing access to a trusted source of information. **Feel free to download and share widely.**

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## OTHER INFO SOURCES

[CDC Interim Guidance for Businesses and Employers Responding to Coronavirus Disease 2019 \(COVID-19\), May 2020](#)

[CDC COVID-19 Employer Information for Office Buildings](#)

[ASHRAE Position Document on Infectious Aerosols April 14, 2020](#)

[American Industrial Hygiene Association, Reopening: Guidance for General Office Setting](#)

[American Institute of Architects, Re-occupancy Assessment Tool](#)

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## TO LEARN MORE:

Visit: [www.whsc.on.ca](http://www.whsc.on.ca)

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