

Confronting airborne transmission of the COVID-19 virus: role of enhanced ventilation

11:00 am July 16, 2020

What we will cover today

- Workers Health & Safety Centre – webinars, training courses – whsc.on.ca
- WHO changes stances and now recognizes the potential for airborne transmission
- Droplets and aerosols
- Enhanced ventilation systems
- Recommendations about ventilation, especially in indoor or enclosed spaces


Can Covid-19 be spread through airborne transmission?



WHO July 9: airborne transmission “cannot be ruled out”

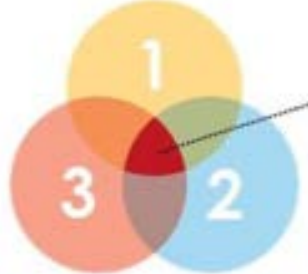
- outbreaks in closed settings such as restaurants, nightclubs, places of worship, workplaces where people may shout, talk or sing
- airborne transmission “cannot be ruled out” in crowded, poorly ventilated indoor locations where infected persons spend long periods of time with others
- more studies are urgently needed to investigate such instances and assess their significance for transmission of COVID-19

Crowded, close, confined

Avoid the Three Cs 
Be aware of different levels of risk in different settings.






There are certain places where COVID-19 spreads more easily:

- 1 Crowded places**
with many people nearby
- 2 Close-contact settings**
Especially where people have close-range conversations
- 3 Confined and enclosed spaces**
with poor ventilation



The risk is higher in places where these factors overlap.
Even as restrictions are lifted, consider where you are going and #StaySafe by avoiding the Three Cs.

WHAT SHOULD YOU DO?

-  Avoid crowded places and limit time in enclosed spaces
-  Maintain at least 1m distance from others
-  When possible, open windows and doors for ventilation
-  Keep hands clean and cover coughs and sneezes
-  Wear a mask if requested or if physical distancing is not possible

If you are unwell, stay home unless to seek urgent medical care.

Aerosol-generating healthcare procedures



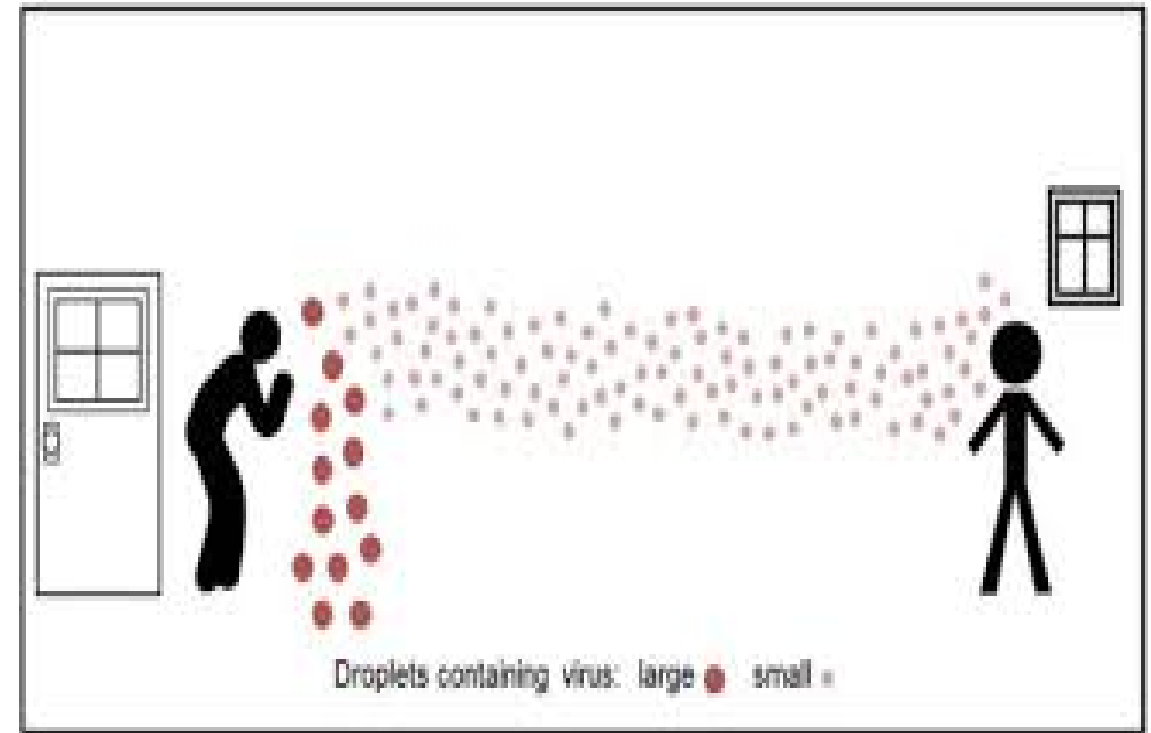
Droplets



- Speaking, coughing, sneezing, singing, whistling or even breathing emits various size droplets from the nose and mouth

Smaller droplets also known as aerosols

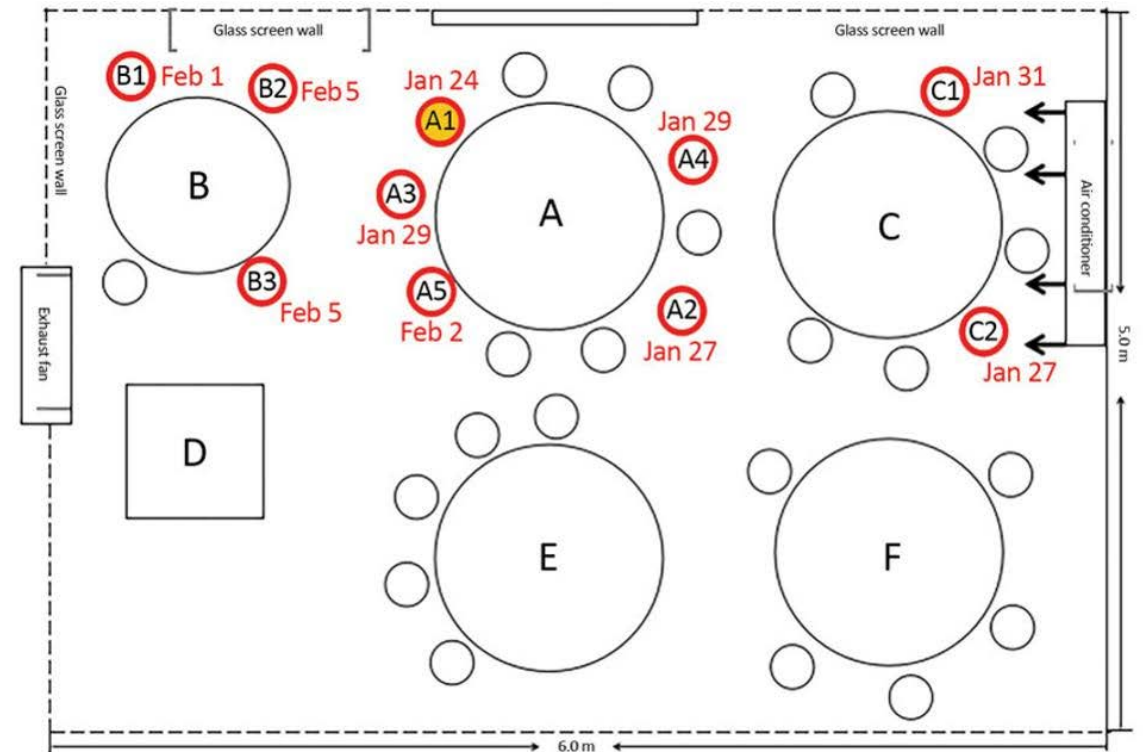
- Larger droplets drop quickly onto surrounding surfaces
- Smaller droplets (aerosols) travel farther and stay in the air longer



Canadian Institutes of Health Research

- “Airborne transmission involves smaller particles that could, in theory, hitch a ride through heating, ventilation, and air conditioning (HVAC) systems”
- “We don’t yet know how far SARS-CoV-2 could travel that way or how infectious those small particles might be”
- “Basically, we want to know if ventilation systems prevent AST [airborne SARS-CoV-2 transmission] or if they actually increase its spread”

Early evidence of potential airborne transmission—restaurant in Guangzhou, China



Extra safety precautions may be needed!

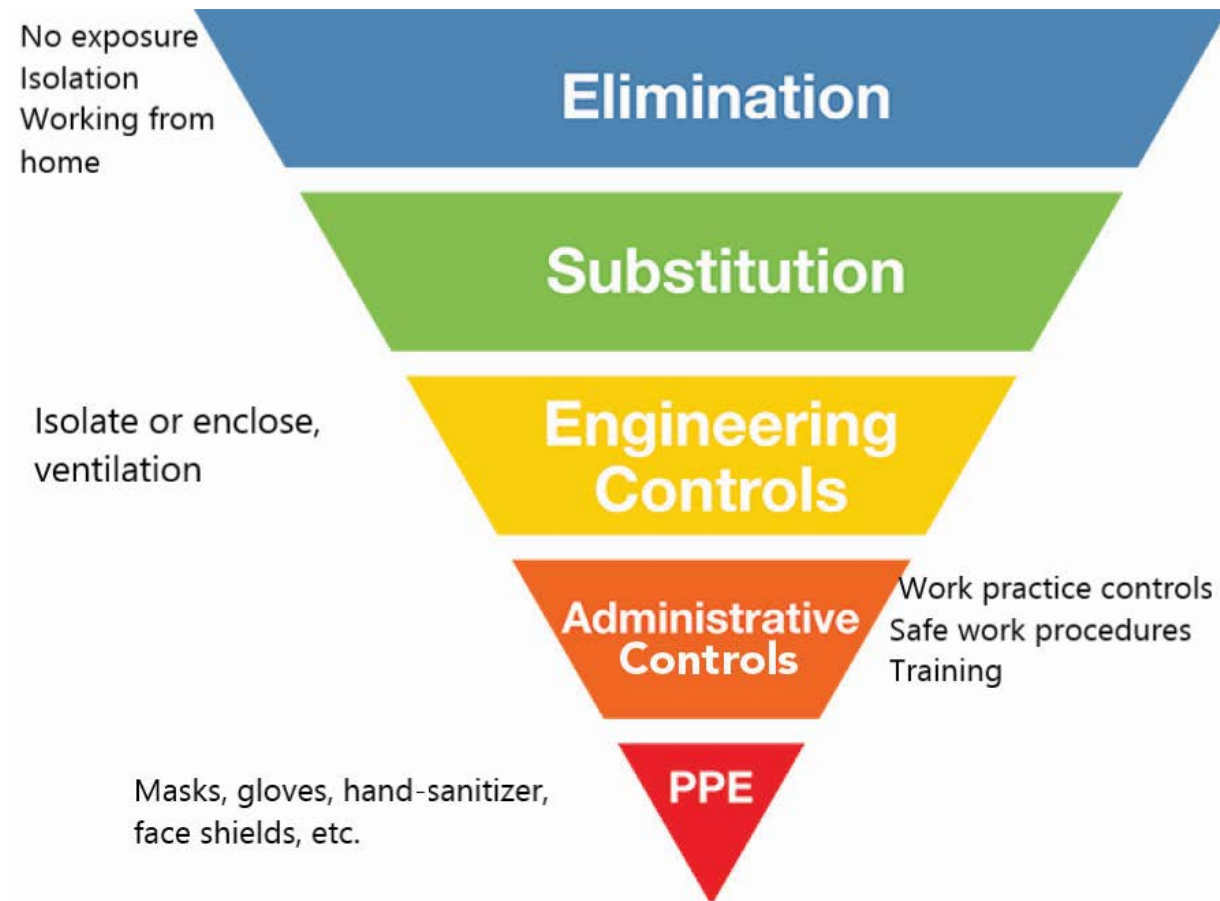
- Minimize recirculating air
- Supply clean outdoor air (fresh air)
- Avoid overcrowding
- Enhance ventilation using
 - Local exhaust
 - High efficiency air filtration
 - Germicidal ultraviolet lights



The precautionary principle

- “When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.”
- “In this context the proponent of an activity, rather than the public, should bear the burden of proof.”
 - Wingspread Statement, January 1998

Hierarchy of Controls



What is ventilation?

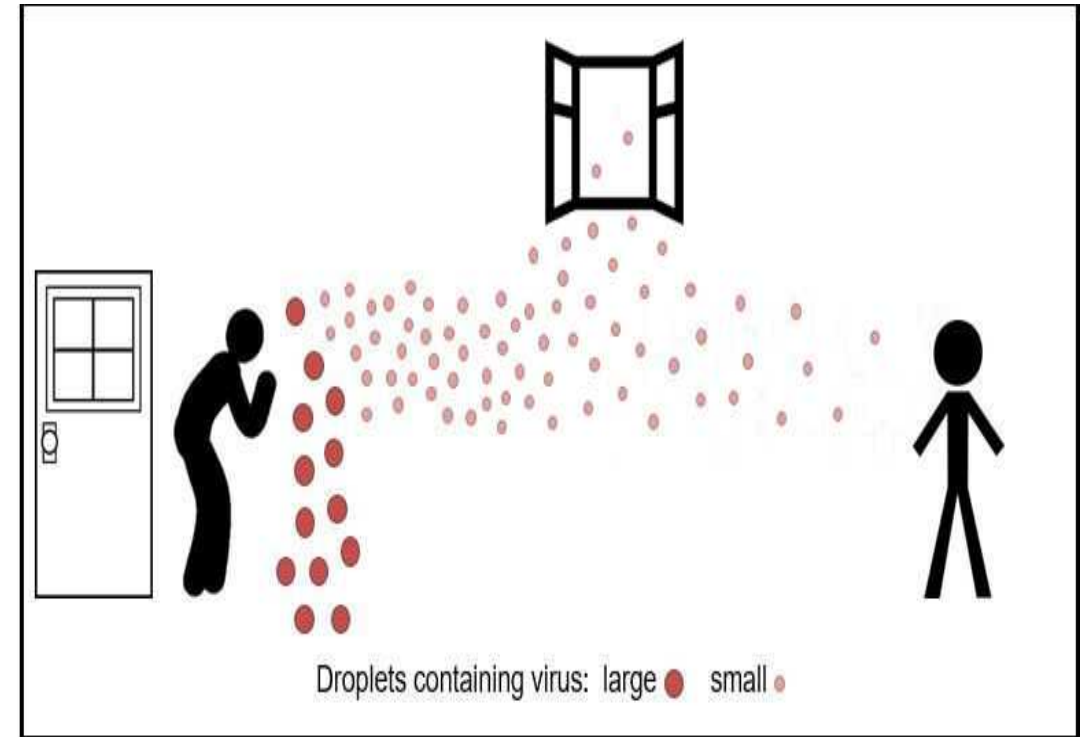
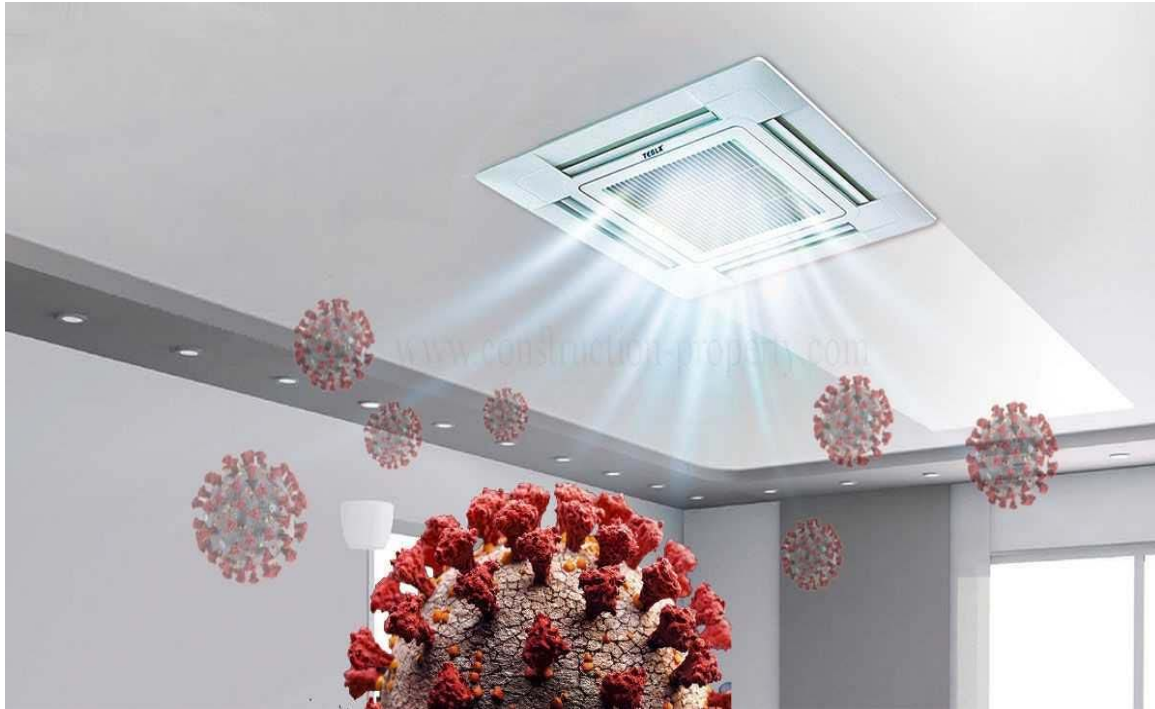
Proper ventilation supplies fresh or clean air, removes contaminated air. It should:

- Ensure continuous oxygen containing fresh air
- Maintain temperature and humidity at comfortable levels
- Remove toxins or biological hazards from the air

Types of ventilation

- General: ventilation of air for the entire building
 - HVAC system
 - May bring 100 per cent fresh air, or recirculate part of the air already in the building
- Local: ventilation of a particular small area
 - Mechanical local ventilation
 - Natural local ventilation

Ventilation issues...



Need for enhanced ventilation

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Developed recommendations based on assumption of airborne transmission

Functioning ventilation

- Assess the heating, ventilation and air conditioning (HVAC) system to ensure it is functioning properly
- Consider duct work and all air purification systems
- Use a certified technician



Increased ventilation rate and duration

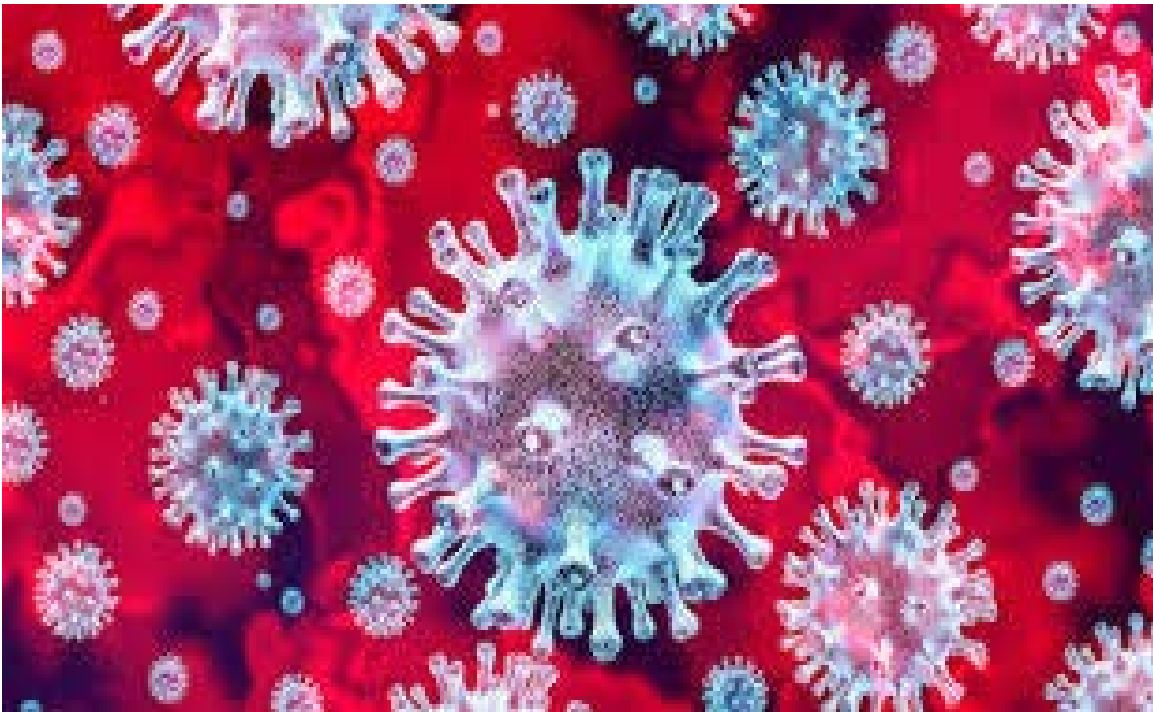
- Increase ventilation rate and run ventilation system longer than normal (24/7 if possible)
- Ensure exhaust fans in bathrooms, change rooms, break or lunch rooms are operating at full capacity and running continuously

High efficiency filtration

- Use high efficiency filtration (minimum value MERV-13 or higher)
- Ensure filters are within their service life and properly installed



Humidity levels



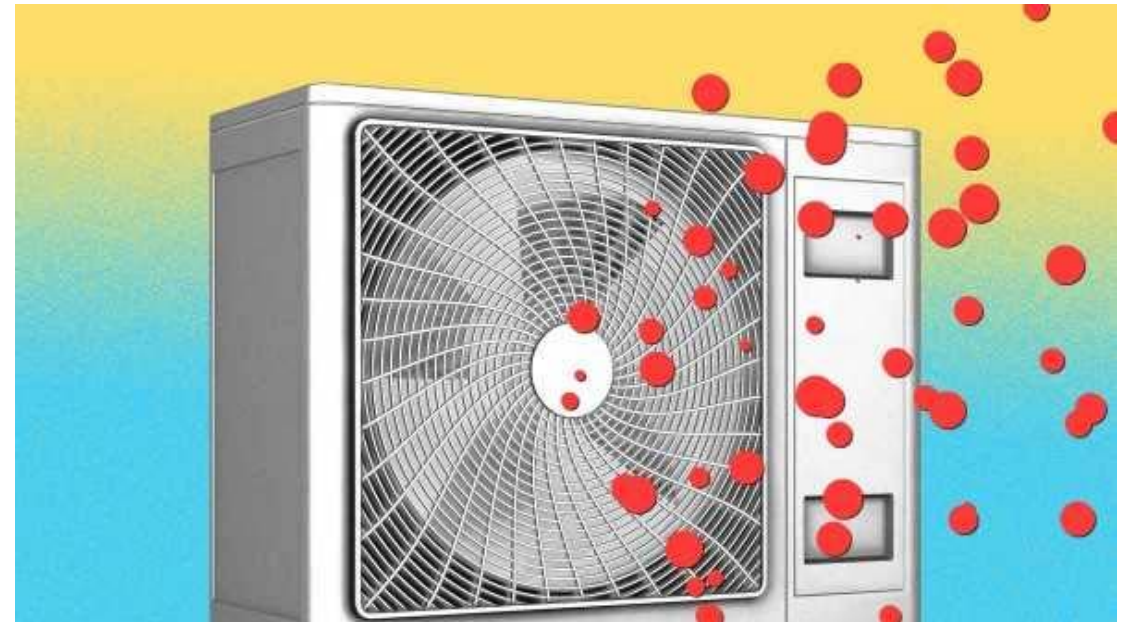
- ASHRAE guidance mirrors recent study findings
- Suggests keeping workplace relative humidity levels between 40 and 60 per cent, if possible

Clean outdoor air

- Increase amount of clean outdoor air circulating into the system to reduce or dilute any contaminants
- Minimize the effect of outdoor air dampers
- Disable demand-controlled ventilation
- Open windows and doors to increase intake of outdoor air
- Beware of external pollutants and any potential functional impacts on the HVAC system

Keep in mind the flow of air in a room

- Air from the breathing zone of one worker should not flow directly to the breathing zone of another
- Consider air flow from general and local exhaust ventilation systems, windows, doors and fans
- Work stations may need to be repositioned accordingly



Single space air cleaners

- ASHRAE suggests also using single space air cleaner units including those using
 - High efficiency particulate air (HEPA) filtration
 - Activated charcoal filtration
 - Electrostatic filtration
 - Ultraviolet irradiation



Clean and disinfect

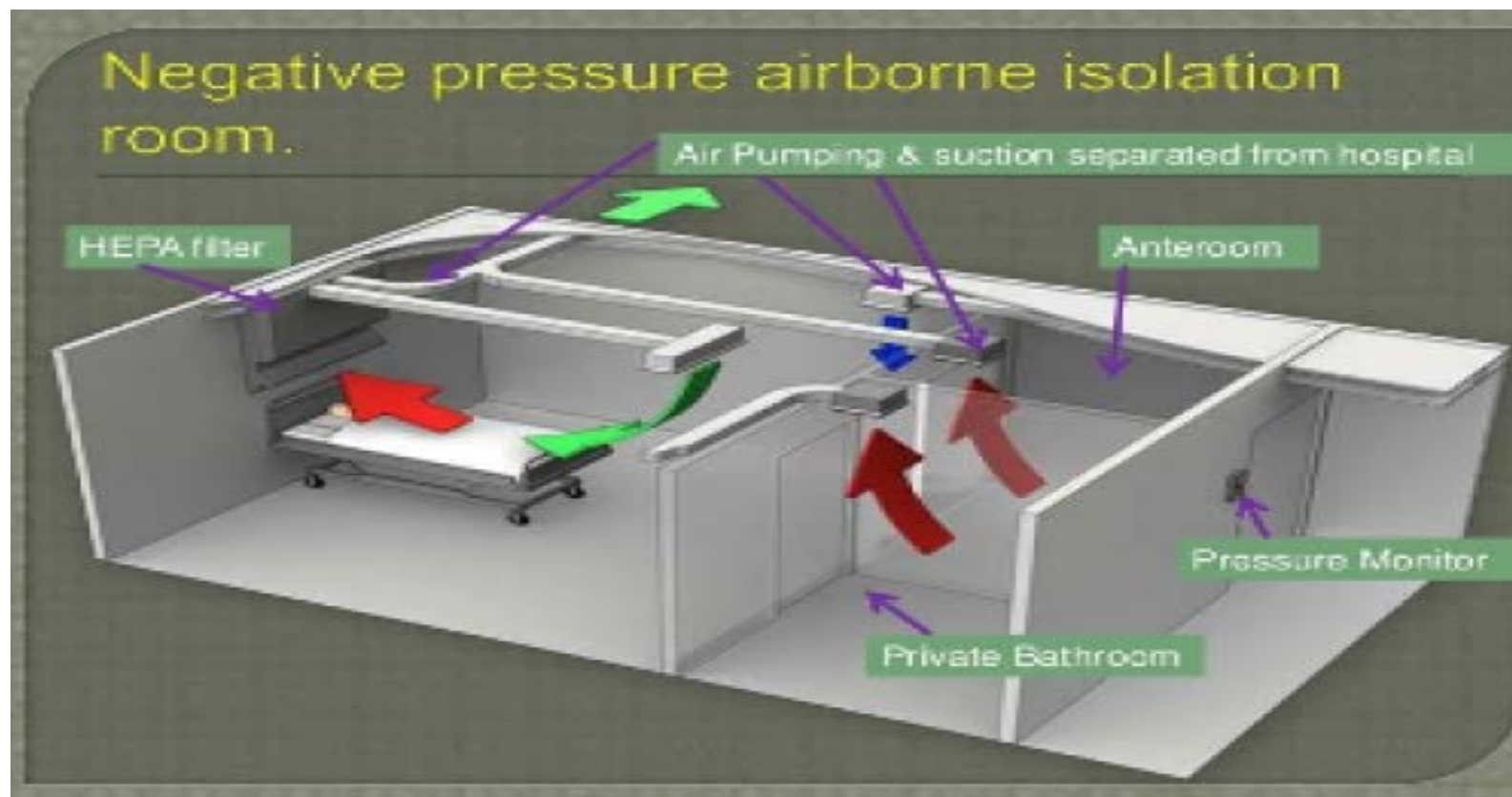


- It is recommended to Clean and disinfect all HVAC intakes and returns daily
- If possible use ultraviolet germicidal irradiation (UVGI) in the ventilation system where available to destroy or inactivate microorganisms

Health care-specific ventilation

- Increase air exchange rates in other rooms, such as soiled linen sorting and storage and janitors' closets, to 12 air changes per hour
- Keep infected patient and resident room doors to hallways closed, if possible
- Install the same ventilation systems used in hospital emergency rooms in dental and clinic offices

Airborne infection isolation rooms



Aerosol generating procedures

- In single well-ventilated negative pressure room, closed door
- Leave the room empty afterwards long enough to permit clearance or settling of aerosols
- Clean and disinfect room after clearing and settling period only
- Clean and disinfect the room between each procedure

Employer duty to protect workers

- Remember, taking all reasonable precautions is an employer duty
- Employers must take every precaution reasonable in the circumstances for the protection of a worker [OHSA, 25(2)(h)]
- This includes ventilation

Joint committees and H&S representatives

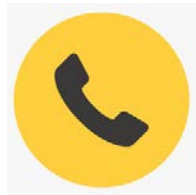
- Receive information from employer
- Report workplace hazards to supervisor and employer
- Make health and safety recommendations
- Consult with employer about proposed industrial hygiene testing strategies and receive information about proposed testing strategies
- Be present at testing and receive results

WHSC training and resources

- Now offering virtual classroom training
- Includes the most popular programs, e.g., certification training for joint health and safety committee members
- New course on COVID-19
- Register for our virtual classroom training on our website or by contacting one of our training services representatives.



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