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Infection Prevention and Control (IPAC) Orientation for IPAC Leads in Long-Term Care:

Construction, Renovation, Maintenance and Design (CRMD)

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June 17, 2022

Learning Objectives

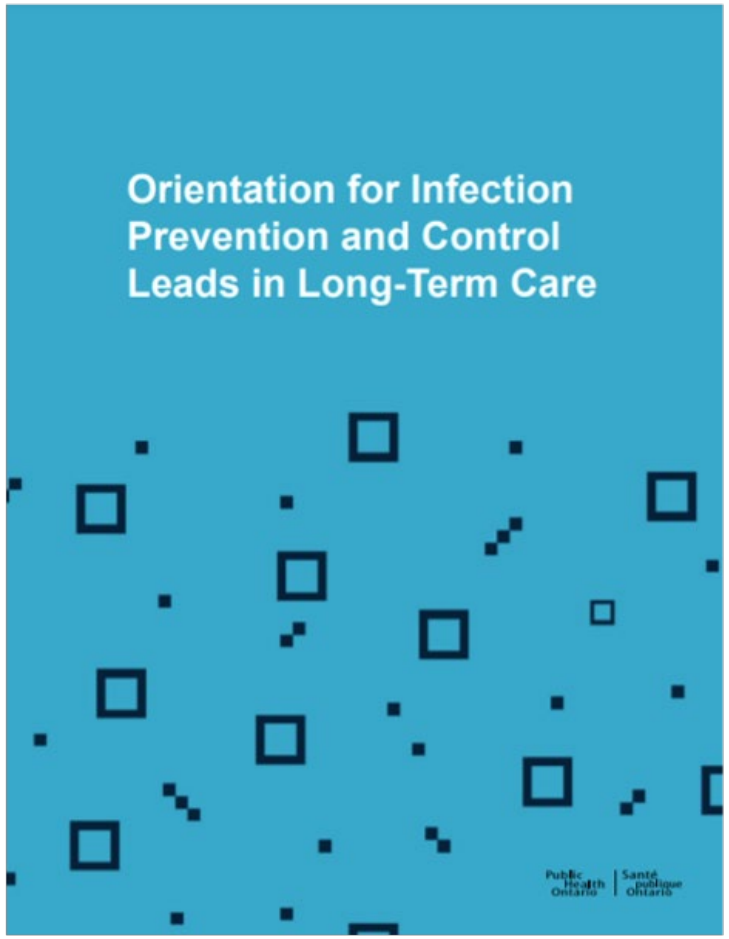
By the end of this session, participants will be able to:

- Identify the importance of supervising construction, renovation, maintenance and design (CRMD) activities in long-term care homes (LTCH)
- Recognize infection prevention and control (IPAC) approaches to CRMD
- Understand key strategies and considerations for ensuring CRMD projects are carried out safely

Agenda

Item	Time	Topic
1	5 minutes	Welcome and Introductions
2	5 minutes	Introduction to the Checklist: IPAC Orientation for Infection Control Leads in LTC
3	35 minutes	Construction, Renovation, Maintenance and Design (CRMD)
4	10 minutes	Questions and Answers
5	5 minutes	Wrap-up and next steps

Checklist for IPAC Orientation for IPAC Leads in Long-Term Care



- PHO has developed a new webpage that will contain the Checklist and the series of presentations
- The Checklist and the series of presentations will help build your IPAC knowledge.

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Orientation for infection prevention and control leads in long-term care [Internet]. Toronto, ON: Queen's Printer for Ontario; 2022 [cited 2022 May 12]. Available from: https://www.publichealthontario.ca/-/media/Documents/I/2022/ipac-leads-orientation-long-term-care.pdf?sc_lang=en.

Construction, Renovation, Maintenance and Design

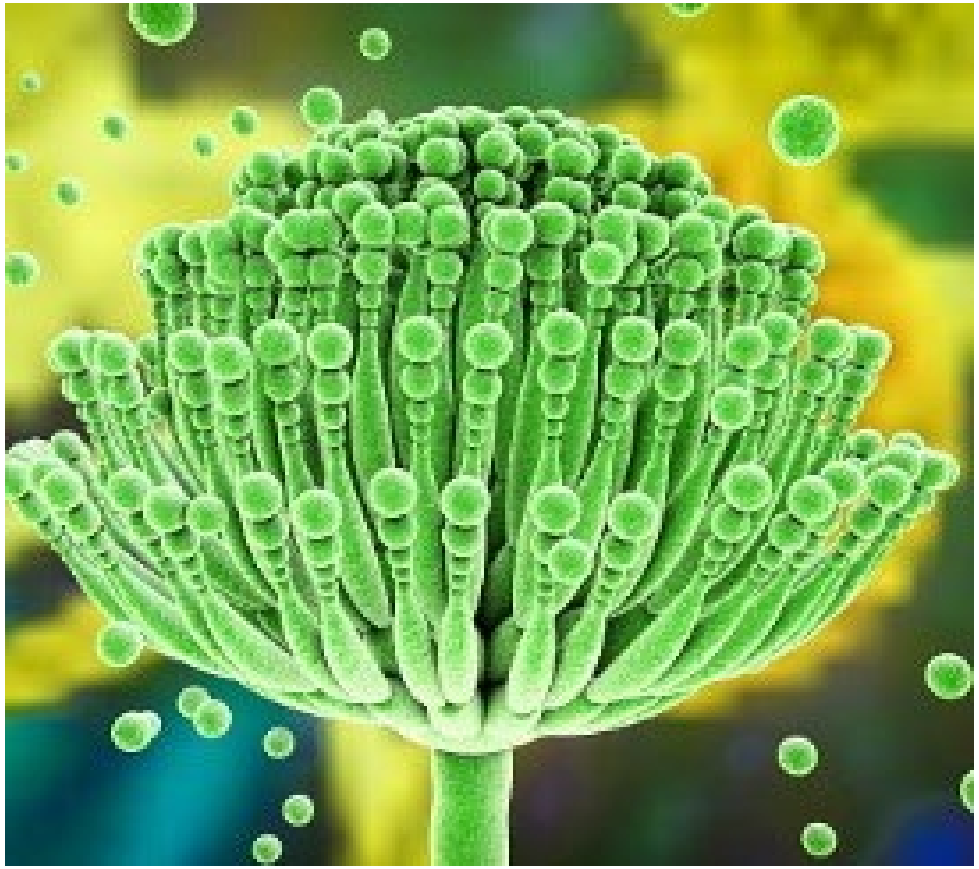
What is Construction, Renovation, Maintenance and Design (CRMD)?

- CRMD has a vast scope but generally involves three phases:
  - Planning
  - Work
  - Commissioning
- Although the active ‘work’ phase may pose the most significant immediate risk as it involves the **demolition and building stages of construction**, all phases can have dire outcomes and lead to infection.

What are the Risks Associated with CRMD?

- Organisms can travel in dust and water
- Can pose significant infections
- Residents are susceptible to infection
- High mortality in the immunocompromised
- Primary pathogens : *Legionella spp*. and *Aspergillus spp*. may be difficult to treat
- Health hazards

Aspergillus species

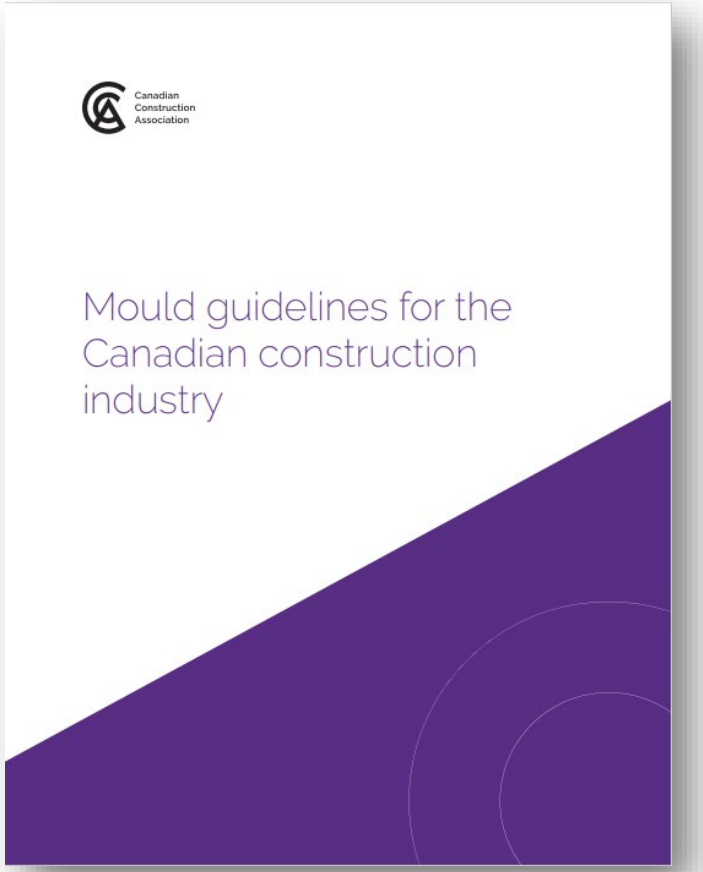


Aspergillus

- Found in decaying organic matter
- *A. fumigatus, A. flavus, A. niger*
- Are small and settle very slowly, they can remain suspended in air for long periods
- Causes aspergillosis infection through inhalation of spores; high mortality rates

CSA Group. CAN/CSA-Z317.13-17: Infection control during construction, renovation, and maintenance of health care facilities. Toronto, ON: CSA Group; 2017.

Mould Remediation



- Ontario guidelines: *Mould Guidelines for the Canadian Construction Industry*
- Remediation depends on scale and size of mould growth.
- Classified by levels I-III
- Remediation best left to professionals
- Legal obligation to protect workers
  - Occupational Health and Safety Act

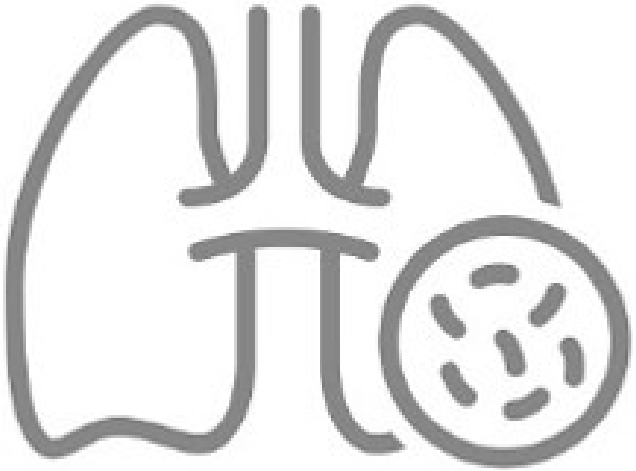
Source: Canadian Construction Association. Mould guidelines for the Canadian construction industry [Internet]. Ottawa, ON: Canadian Construction Association; 2018 [cited 2021 Dec 2]. Available from: https://www.cca-acc.com/wp-content/uploads/2019/02/Mould-guidelines2018.pdf.

Occupational Health and Safety Act, RSO 1990, c O.1. Available from: https://www.ontario.ca/laws/statute/90o01.

Legionella species (1/2)

- Gram-negative bacteria
- Can cause Legionnaires' disease (pneumonia) and Pontiac fever (a flu-like illness).
- Found in natural water environments and can grow in human-made water systems, such as plumbing, cooling towers, hot tubs, showers and decorative fountains.

Legionella species (2/2)



- Can spread in droplets small enough for people to breathe in or less commonly, by aspiration of drinking water containing *Legionella*
- The elderly and immunocompromised are at greatest risk of illness

IPAC Approaches to CRMD

When to Consider IPAC in CRMD

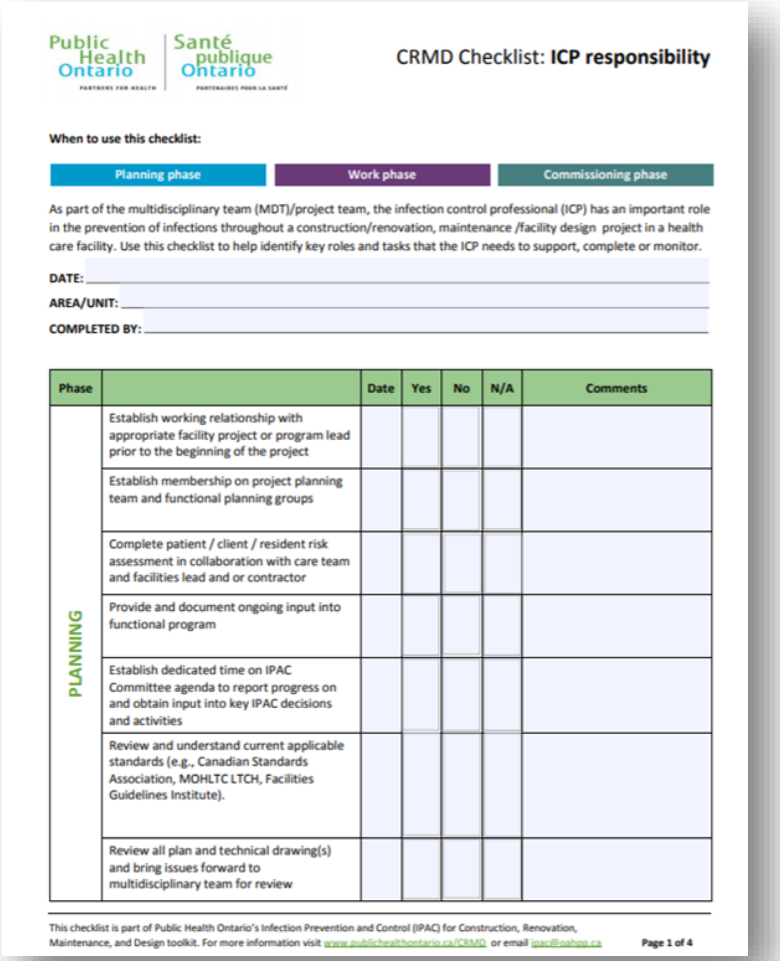
IPAC needs to be involved at all phases of CRMD

- Planning
- Work
- Commissioning

- An IPAC lead has responsibilities at each stage – this checklist ensures all are considered.

PHO Resources for Construction, Renovation, Maintenance and Design (CRMD)

CRMD Checklist: ICP Responsibility



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CRMD Checklist: **ICP responsibility**

When to use this checklist:

Planning phase | Work phase | Commissioning phase

As part of the multidisciplinary team (MDT)/project team, the infection control professional (ICP) has an important role in the prevention of infections throughout a construction/renovation, maintenance /facility design project in a health care facility. Use this checklist to help identify key roles and tasks that the ICP needs to support, complete or monitor.

DATE: _____

AREA/UNIT: _____

COMPLETED BY: _____

Phase		Date	Yes	No	N/A	Comments
PLANNING	Establish working relationship with appropriate facility project or program lead prior to the beginning of the project					
	Establish membership on project planning team and functional planning groups					
	Complete patient / client / resident risk assessment in collaboration with care team and facilities lead and or contractor					
	Provide and document ongoing input into functional program					
	Establish dedicated time on IPAC Committee agenda to report progress on and obtain input into key IPAC decisions and activities					
	Review and understand current applicable standards (e.g., Canadian Standards Association, MOHLTC LTCH, Facilities Guidelines Institute).					
	Review all plan and technical drawing(s) and bring issues forward to multidisciplinary team for review					

This checklist is part of Public Health Ontario's Infection Prevention and Control (IPAC) for Construction, Renovation, Maintenance, and Design toolkit. For more information visit www.publichealthontario.ca/CRMD or email ipac@oahpp.ca

Page 1 of 4

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Construction, renovation, maintenance and design (CRMD) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2022 Mar 24]. Available from: https://www.publichealthontario.ca/en/health-topics/infection-prevention-control/crmd.

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). CRMD checklist: ICP responsibility [Internet]. Toronto, ON: Queen's Printer for Ontario; 2015 [cited 2022 Mar 24]. Available from: https://www.publichealthontario.ca/-/media/documents/c/2015/crmd-ipc-responsibility.pdf?la=en.

IPAC and the CRMD Planning Phase

IPAC's Role in the Planning Phase

- Collaborate with the project team from the initial stages
- Ensure compliance with current requirements
  - CSA standards
  - Ministry of Health and Long-Term Care's Long-Term Care Home Design Manual
- Provide ongoing input into the functional program
- Consult with experts
- Ensure contractors and workers have IPAC knowledge
  - Infection Prevention and Control Professional (ICP) to orient incoming workers on IPAC fundamentals (i.e., mask use, hand hygiene, IPAC construction requirements)
- Perform an Infection Control Risk Assessment (ICRA)

Ontario. Ministry of Health and Long-Term Care. Long-term care home design manual 2015 [Internet]. V.1.1. Toronto, ON: Queen's Printer for Ontario; 2015 [cited 2022 Jun 16]. Available from: https://www.health.gov.on.ca/en/public/programs/ltc/docs/home_design_manual.pdf.

How do I perform an Infection Control Risk Assessment?

- A systematic tool called the Infection Control Risk Assessment (ICRA) supports risk assessment
- ICRA considers two factors in assessing risk:
  - Population involved
  - Type of CRMD activity
- Based on these factors, the ICRA matrix generates a list of one of 4 Categories of Preventative Measures (PM)

Population Risk Groups

Risk Group 1 Low	Risk Group 2 Moderate	Risk Group 3 Moderate/High	Risk Group 4 High
• Housekeeping areas • Physical plant Workshops • Office areas • Unoccupied wards • Public areas • Laundry	• Patient care areas (not in groups 3 and 4) • Outpatient clinics (not oncology or surgery) • Physiotherapy • Occupational • Admission/Discharge Units • Morgue • Autopsy • Waiting room	• Geriatrics • Peadiatrics • Labour and birthing • Diagnostic imaging • ER (except trauma) • LTC Surgical units • Respiratory therapy • Nuclear med and lab • Food prep/serving/dining • Medical units • Hydrotherapy • Echocardiography	• ICU • ORU, PACU, Anaes • Oncology – IP & OP • Sterile reprocessing • Transplant – IP & OP • Pharmacy Admixing Rms • Dialysis • Immune Deficient pts. • Trauma rooms • Pacemaker • Dental procedures • Bronchoscopy, Cystoscopy & Endoscopy

Adapted from: Health Canada. Construction-related nosocomial infections in patients in health care facilities. Decreasing the risk of *Aspergillus*, *Legionella* and other infections. Can Commun Dis Rep. 2001;27 Suppl 2:i-x,1-42. Available from: https://publications.gc.ca/collections/Collection/H12-21-3-27-2E.pdf.. License: CC BY 4.0

Type of CRMD Activity

Type A

- Inspection activities
- Non-invasive activities

Type B

- Small scale activities
- Minimal dust generated

Type C

- High-level of dust
- Requires demolition
- Removal of fixed component or assembly or can't be completed in one week-shift

Type D

- High-levels of dust
- Major demolition
- Major construction
- More than one-week shift

Adapted from: Health Canada. Construction-related nosocomial infections in patients in health care facilities. Decreasing the risk of *Aspergillus*, *Legionella* and other infections. Can Commun Dis Rep. 2001;27 Suppl 2:i-x,1-42. Available from: https://publications.gc.ca/collections/Collection/H12-21-3-27-2E.pdf.. License: CC BY 4.0

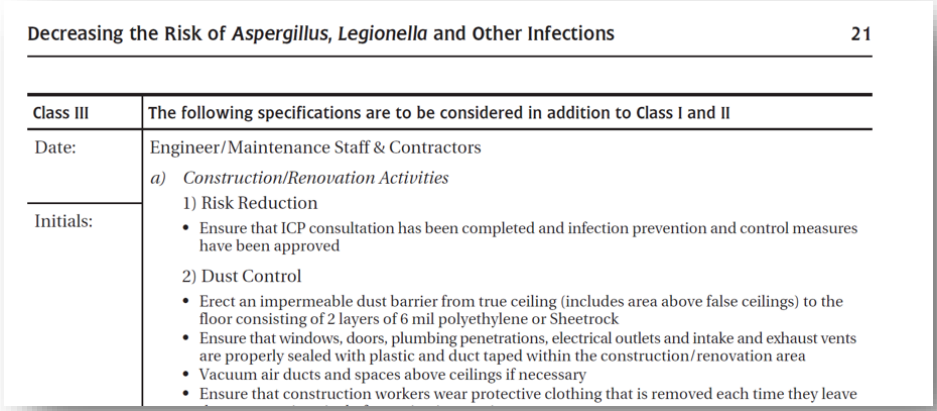
Preventive Measures Analysis

Risk Group	Construction Activity			
	Type A	Type B	Type C	Type D
Group 1	I	II	II	III/IV
Group 2	I	II	III	IV
Group 3	I	II	III/IV	IV
Group 4	I - III	III/IV	III/IV	IV

Adapted from: Health Canada. Construction-related nosocomial infections in patients in health care facilities. Decreasing the risk of *Aspergillus*, *Legionella* and other infections. Can Commun Dis Rep. 2001;27 Suppl 2:i-x,1-42. Available from: https://publications.gc.ca/collections/Collection/H12-21-3-27-2E.pdf.. License: CC BY 4.0

ICRA Preventative Measures

- Preventative measures describe various strategies to mitigate risk to the residents, staff and visitors.
- Examples of measures can be found in the Health Canada document: **Construction-related Nosocomial Infections in Patients in Health Care Facilities**



Decreasing the Risk of *Aspergillus, Legionella* and Other Infections 21

Class III	The following specifications are to be considered in addition to Class I and II
Date:	Engineer/Maintenance Staff & Contractors *a) Construction/Renovation Activities* 1) Risk Reduction • Ensure that ICP consultation has been completed and infection prevention and control measures have been approved 2) Dust Control • Erect an impermeable dust barrier from true ceiling (includes area above false ceilings) to the floor consisting of 2 layers of 6 mil polyethylene or Sheetrock • Ensure that windows, doors, plumbing penetrations, electrical outlets and intake and exhaust vents are properly sealed with plastic and duct taped within the construction/renovation area • Vacuum air ducts and spaces above ceilings if necessary • Ensure that construction workers wear protective clothing that is removed each time they leave
Initials:	

Source: Health Canada. Construction-related nosocomial infections in patients in health care facilities. Decreasing the risk of *Aspergillus*, *Legionella* and other infections. Can Commun Dis Rep. 2001;27 Suppl 2:i-x,1-42. Reproduction is a copy of the version available from: https://publications.gc.ca/collections/Collection/H12-21-3-27-2E.pdf.. License: CC BY 4.0

Barriers (“Hoarding”)

- One type of preventative measure
- Temporary
- Used to isolate occupied areas from areas under construction or renovation
- Appropriate types of hoarding materials include:
  - Polyethylene sheets
  - Drywall (gypsum board)
  - Impermeable temporary containment units.

IPAC and the CRMD Work Phase

IPAC's Role in the Work Phase (1/3)

- Participate in scheduled project meetings
- Tour CRMD area daily and audit compliance with IPAC measures

It's critical that any changes to the agreed upon plan be discussed so that both risk and mitigation strategies are revisited and updated accordingly.

IPAC's Role in the Work Phase (2/3)

- Provide immediate feedback to onsite supervisor
- Raise IPAC gaps or issues to project lead/stakeholder team, re-education may be necessary
- Major breaches may require immediate suspension of activities, pending corrective action

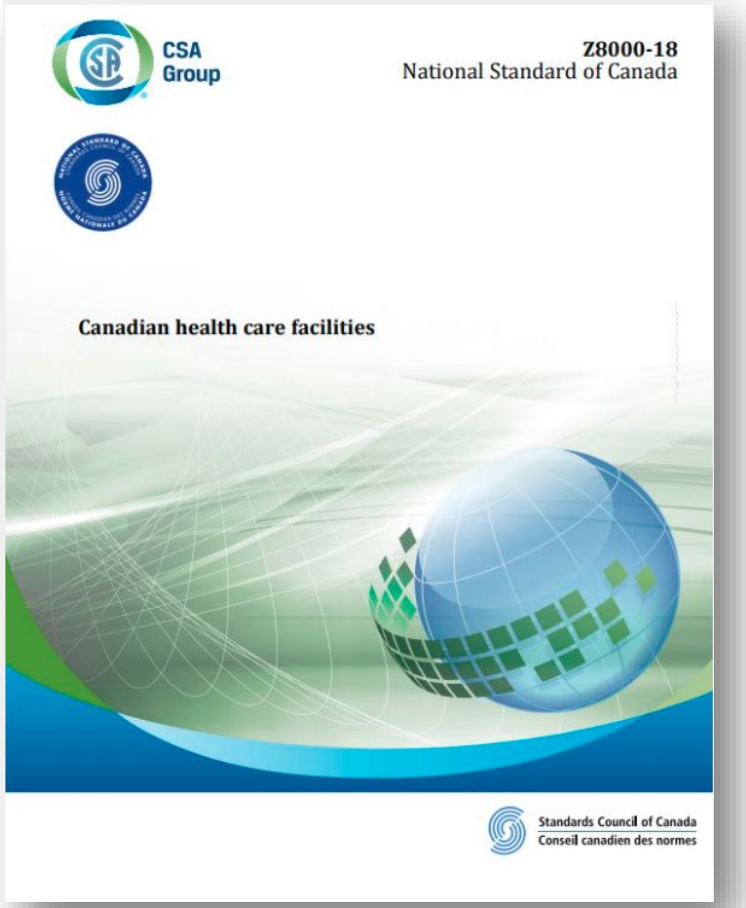
IPAC's Role in the Work Phase (3/3)

- IPAC lead to ensure ongoing, active infection surveillance
- Infections identified during or shortly after CRMD work should raise suspicion
- Heightened awareness and monitoring for infections in residents during CRMD projects especially for certain infections with delayed onset. For example: Fungal infections of the skin and lungs.
- Identifying certain microorganism (e.g., *Aspergillus*) that are closely linked to CRMD activity, should raise flags as they are a concern

IPAC and the CRMD Commissioning Phase

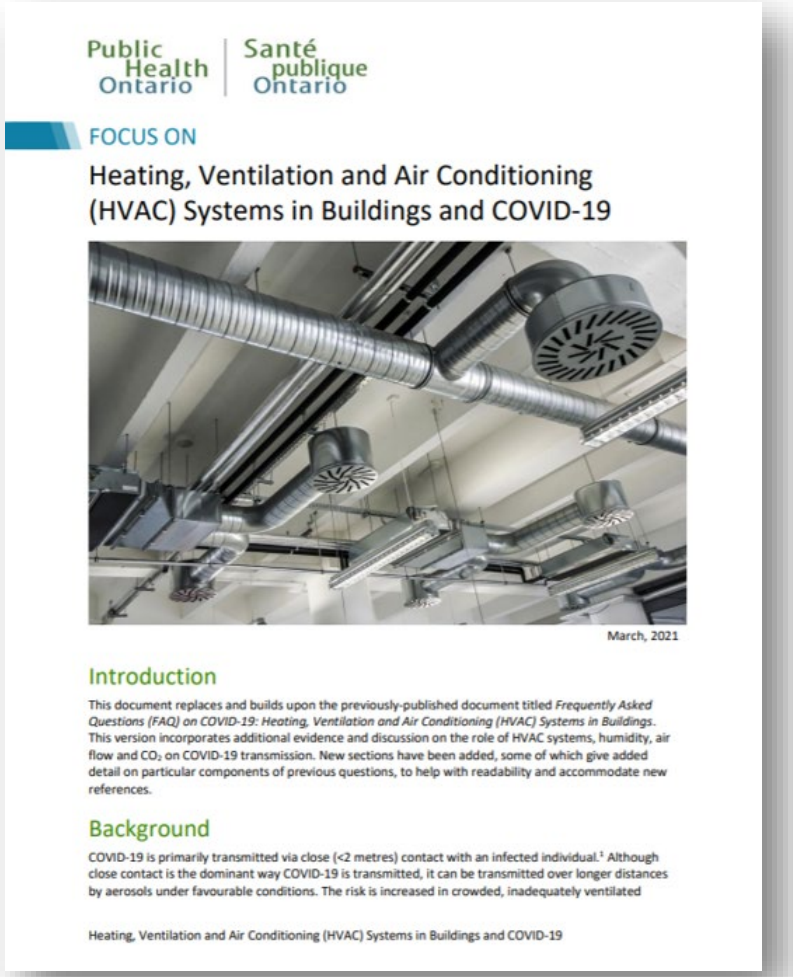
IPAC's Role in the Commissioning Phase (1/2)

- Systematic verification, documentation and training process
- Commissioning ensures that the project meets the requirements, but that the system itself functions as it was designed
- Begins at pre-design stage through post-occupancy and operations phases
- Integral part of the design and construction process
- Intended to be undertaken throughout the life of a facility



CSA Group. CAN/CSA Z8000-18: Canadian health care facilities. Toronto, ON: CSA Group; 2018.

IPAC's Role in the Commissioning Phase (2/2)



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FOCUS ON

Heating, Ventilation and Air Conditioning (HVAC) Systems in Buildings and COVID-19

March, 2021

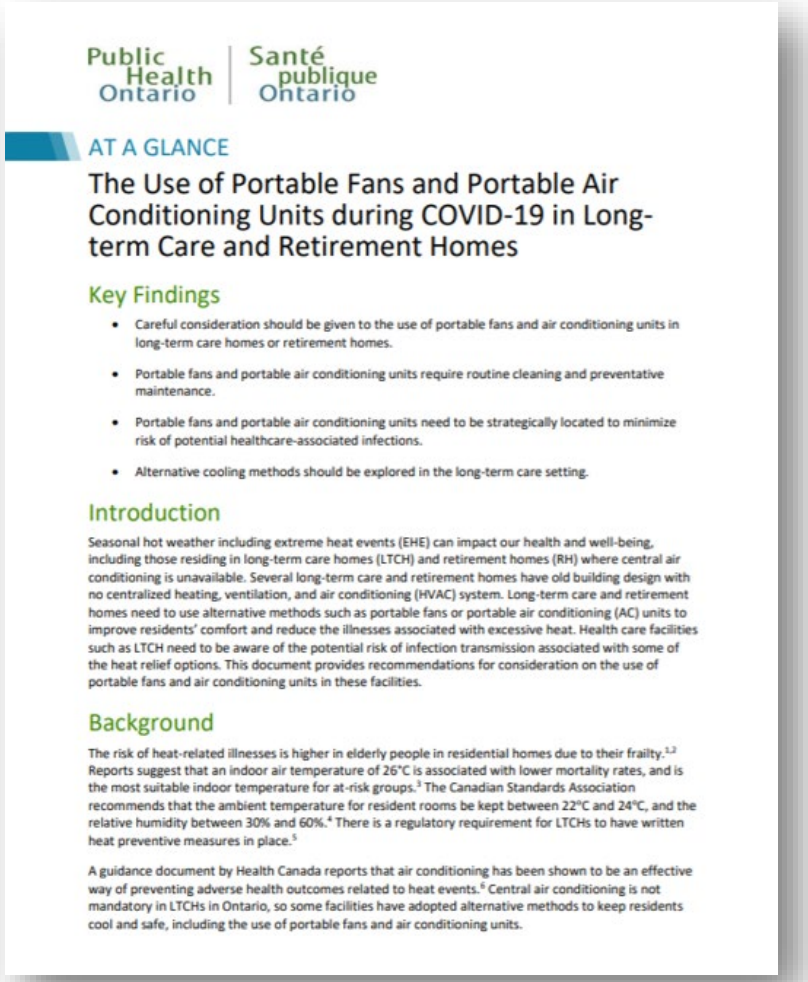
Introduction

This document replaces and builds upon the previously-published document titled *Frequently Asked Questions (FAQ) on COVID-19: Heating, Ventilation and Air Conditioning (HVAC) Systems in Buildings*. This version incorporates additional evidence and discussion on the role of HVAC systems, humidity, air flow and CO_2 on COVID-19 transmission. New sections have been added, some of which give added detail on particular components of previous questions, to help with readability and accommodate new references.

Background

COVID-19 is primarily transmitted via close (<2 metres) contact with an infected individual.[1] Although close contact is the dominant way COVID-19 is transmitted, it can be transmitted over longer distances by aerosols under favourable conditions. The risk is increased in crowded, inadequately ventilated

Heating, Ventilation and Air Conditioning (HVAC) Systems in Buildings and COVID-19



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AT A GLANCE

The Use of Portable Fans and Portable Air Conditioning Units during COVID-19 in Long-term Care and Retirement Homes

Key Findings

- Careful consideration should be given to the use of portable fans and air conditioning units in long-term care homes or retirement homes.
- Portable fans and portable air conditioning units require routine cleaning and preventative maintenance.
- Portable fans and portable air conditioning units need to be strategically located to minimize risk of potential healthcare-associated infections.
- Alternative cooling methods should be explored in the long-term care setting.

Introduction

Seasonal hot weather including extreme heat events (EHE) can impact our health and well-being, including those residing in long-term care homes (LTCH) and retirement homes (RH) where central air conditioning is unavailable. Several long-term care and retirement homes have old building design with no centralized heating, ventilation, and air conditioning (HVAC) system. Long-term care and retirement homes need to use alternative methods such as portable fans or portable air conditioning (AC) units to improve residents' comfort and reduce the illnesses associated with excessive heat. Health care facilities such as LTCH need to be aware of the potential risk of infection transmission associated with some of the heat relief options. This document provides recommendations for consideration on the use of portable fans and air conditioning units in these facilities.

Background

The risk of heat-related illnesses is higher in elderly people in residential homes due to their frailty.[1,2] Reports suggest that an indoor air temperature of 26°C is associated with lower mortality rates, and is the most suitable indoor temperature for at-risk groups.[3] The Canadian Standards Association recommends that the ambient temperature for resident rooms be kept between 22°C and 24°C, and the relative humidity between 30% and 60%.[4] There is a regulatory requirement for LTCHs to have written heat preventive measures in place.[5]

A guidance document by Health Canada reports that air conditioning has been shown to be an effective way of preventing adverse health outcomes related to heat events.[6] Central air conditioning is not mandatory in LTCHs in Ontario, so some facilities have adopted alternative methods to keep residents cool and safe, including the use of portable fans and air conditioning units.

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Heating, ventilation and air conditioning (HVAC) systems in buildings and COVID-19 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2022 Jun 16]. Available from: https://www.publichealthontario.ca/-/media/documents/ncov/ipac/2020/09/covid-19-hvac-systems-in-buildings.pdf?la=en.

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). The use of portable fans and portable air conditioning units during COVID-19 in long-term care and retirement homes [Internet]. Toronto, ON: Queen's Printer for Ontario; 2020 [cited 2022 Jun 16]. Available from: https://www.publichealthontario.ca/-/media/documents/ncov/ltcrh/2020/08/covid-19-fans-air-conditioning-ltcrh.pdf?la=en.

Key Strategies and Considerations for Ensuring Safe CRMD

Common Issues and Considerations (1/2)

Scope creep

- Projects often get bigger, become more involved than anticipated

Containment

- With time, barriers fall apart and dust is no longer contained

Working outside designated spaces

- Contractors may need to access other spaces to get work done, ensure this is considered during the planning phase (i.e., tracing a wire, or pulling cable may need to be done through vulnerable spaces like PPE stock pile or medication rooms)

Common Issues and Considerations (2/2)

Traffic

- How will contractors enter and leave, what route will waste be taken out of?

Cleaning

- Who is responsible for daily cleaning?
- Where should sticky mats be placed?
- Are contractors cleaning dust/debris off of their clothes prior to exiting work zone?

Downtime procedures

- Is there a plan for shutdowns of areas or services (e.g., dining areas, water, HVAC)?
  - This may require after hours work or identifying safe alternative (e.g., bath in a bag products)

Resident and Staff Safety

- Containment setup (e.g., dry run a bed or wheel chair around proposed containment to ensure adequate space remains)
- Appropriate signage/notification (e.g., danger, restricted access, mould remediation, notification about noise levels)
- Self closing, secure construction entrance doors (e.g., wandering residents)
- Thoughtful placement of necessary equipment (e.g., sticky mat placed in a manner that doesn't make it a trip hazard)

Key Strategies for Success

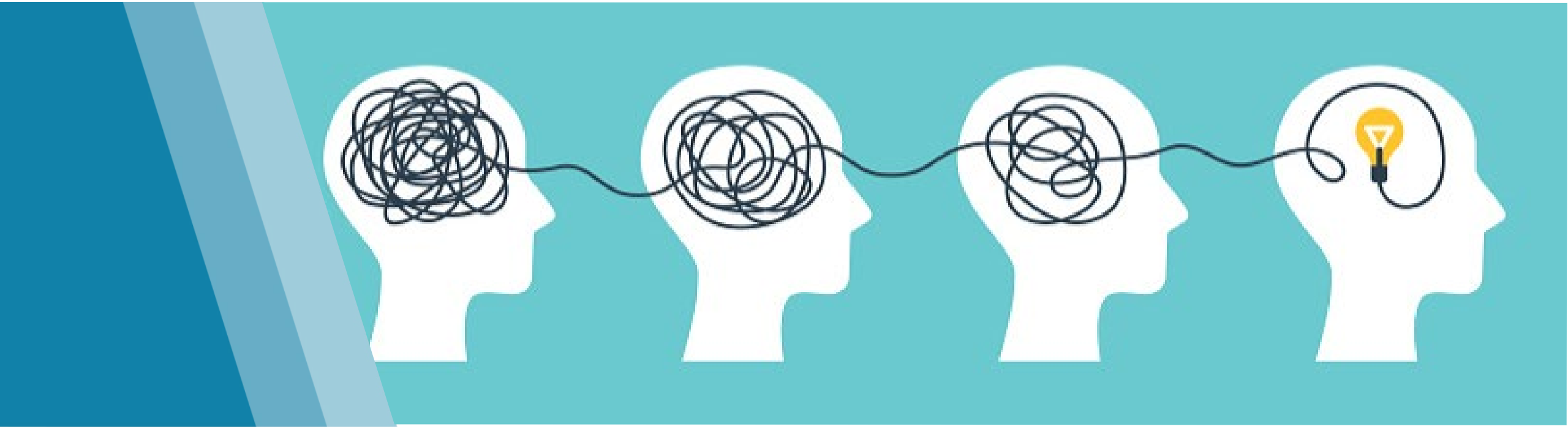
- Onsite IPAC involvement is paramount in ensuring ongoing compliance
- Clearly outline expectations with contractors and provide immediate feedback if there are issues
- Ensure oversight is an assigned responsibility
- Raise expectations with staff, welcome feedback
  - Frontline staff are your eyes and ears on the ground
  - Liaise with cleaning staff (i.e., have cleaning requirements increased due to poor containment)

Additional IPAC Resources

Continue to grow your knowledge and fill outstanding gaps with relevant sections from additional readings:

- IPAC Canada. Healthcare facility design and construction resources [Internet]. Winnipeg, MB: IPAC Canada; [no date] [cited 2022 Mar 24]. Available from: https://ipac-canada.org/healthcare-facility-design-resources.php.
- Ontario. Ministry of Health and Long-Term Care. Long-term care home design manual 2015 [Internet]. V.1.1. Toronto, ON: Queen's Printer for Ontario; 2015 [cited 2022 Mar 24]. Available from: https://www.health.gov.on.ca/en/public/programs/ltc/docs/home_design_manual.pdf.

Questions and Answers



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