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COVID-19 Precautions for Multi-unit Residential Buildings

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Introduction

Multi-unit residential buildings bring together tens to hundreds of people within the same building envelope and in contact with the same common areas. In contrast to those living in detached and semi-detached housing, people in multi-unit residential buildings may find it difficult to avoid contact with their neighbours, both because they must access common areas, like foyers and elevators, to reach their living space, and because they may be required to use shared facilities like laundry rooms.

Building managers (including strata or condominium corporations, landlords, and other property managers) have a legal and ethical responsibility to implement measures to decrease the risk of disease transmission to their residents and employees. Public health legislation prohibits the creation of a public health hazard, such as unsanitary premises, and building managers may be called upon to take precautionary measures under this and other emergency legislation. Building management can somewhat restrict residents' movements (e.g., by closing gathering spaces in the building), but they do not have the power to confine residents to their units.[1] Thus, COVID-19 precautions for multi-unit residential buildings require a judicious mix of risk mitigation, risk communication, health promotion, and of course heightened sanitary measures.

This document was developed to synthesize the available evidence and guidance regarding COVID-19 precautions for all types of multi-unit residential housing. It discusses what is known about disease transmission and subsequently what precautions are necessary, and how changes to sanitation, building operation, health communication and governance can be bundled together to most effectively decrease the risk of transmission

Challenges for devising COVID-19 recommendations: how is the virus transmitted?

The means by which the virus is transmitted is essential to understanding how inhabitants of a shared space may be affected by one another. SARS-CoV-2, the virus that gives rise to COVID-19, is new to humans and relatively little primary research is available.

We know that the main mode of COVID-19 transmission is through **direct contact** and **respiratory droplets** (**Box 1**), both of which require being in close proximity of an infected person.[2] Less is known about other modes of transmission, such as **indirect contact** with contaminated surfaces or objects (fomites), **airborne transmission** through aerosols, or **transmission via contact with the feces** of an infected individual.

While isolation helps to reduce the risk of direct contact and respiratory droplets, contaminated surfaces and airborne transmission (if they occur) raise concerns for shared spaces and ventilation in multi-unit residential housing.

BOX 1: MODES OF TRANSMISSION

- Direct contact with an infected person.
- Indirect contact through contaminated surfaces (fomites).
- Respiratory droplets (>5 µm in diameter) that carry the virus, but settle out within 1–2 m of the infected person.
- Airborne transmission occurs via aerosols or droplet nuclei (<5 µm) that remain suspended for longer periods and may travel significant distances.
- Transmission via fecal matter, either via ingestion or inhalation of an aerosol.

Surface contamination and indirect contact

Research on SARS-CoV-2, other human coronaviruses,[a] and animal coronaviruses shows that these viruses vary widely in their persistence on surfaces. Some SARS-Co-V strains can remain infectious on surfaces up to 9 days at room temperature, or even weeks at lower temperatures.[3] Recent laboratory data has shown that the SARS-CoV-2 remained infectious up to 72 hours on plastic surfaces, with much shorter periods of viability on copper (4 h), cardboard (24 h), and stainless steel (48 h).[4]

During the outbreak on the *Diamond Princess,* viral RNA[b] was detected on cabin surfaces up to 17 days after the infected inhabitants (both symptomatic and asymptomatic) had left.[5] In a hospital setting, viral RNA was detected on various surfaces (including the toilet) of a symptomatic patient's room that had not been cleaned. However, no viral RNA was found on the same surfaces of two other patient rooms that had undergone routine cleaning.[6] Thus, although ill

[a] Current public health action draws heavily on research from SARS-CoV-1 and MERS-CoV, which were responsible for the SARS and MERS outbreaks of 2002 and 2012, respectively.

[b] Detection of viral RNA means that the virus has been present, but does not mean that it is viable or infectious at the time of sampling.

people shed the virus into the environment, it is possible to adequately decontaminate those surfaces with routine methods.

Airborne transmission via aerosols

Unlike heavier respiratory droplets, which drop out of the air quickly and are not expected to move long distances in indoor settings, aerosols have the ability to remain suspended in the air and/or spread through the building's airspace. The limited available research has shown that SARS-CoV-2 aerosol generated in a laboratory remained infectious for at least three hours.[4] However, air sampling in the room of a patient with mild disease did not review the presence of the virus in the air (at that point in time), although many surfaces throughout the room did reveal contamination, including air exhaust vents.[6] Thus, airborne transmission may be possible, but it does not appear to be a primary mode of transmission and its overall significance to the current pandemic is unclear.

Transmission via contact with feces

Fecal-respiratory and fecal-oral transmission of the virus is possible, but their significance to the pandemic is again unknown. COVID-19 is associated with gastrointestinal symptoms like diarrhea in some cases,[2,7] and viral RNA has been detected in a toilet used by an infected person.[6] As with SARS-CoV-1, patients with COVID-19 may continue to shed virus through feces even after the respiratory portion of the infection has resolved.[7]

Fecal-respiratory transmission of SARS-Cov-1 was observed during the much-studied Amoy Gardens outbreak in Hong Kong in 2003. In this incident, unsealed bathroom drain traps, combined with negative pressure created by bathroom exhaust fans, caused aerosolized virus from feces to be drawn from the sanitary sewer lines into the living space and then transmitted to healthy people in the same building.[8] Because aerosols can travel significant distances, the residents of six other buildings downwind of the affected building were also infected. In total, 321 people developed similar symptoms to the index case, including diarrhea, and 42 people died. Early reports of a similar incident in Hong Kong suggests that SARS-CoV-2 may also be able to transmit in this manner, although the investigation is ongoing.[9]

Cleaning and disinfection of common areas

High-touch surfaces in common areas

Currently, public health agencies believe that the virus can survive for hours to days on hard surfaces; therefore, thorough and frequent cleaning and disinfection are essential. In multi-unit residential housing, that means adequately and frequently cleaning *high-touch surfaces* in the common areas, including enterphones, elevators panels and buttons, light switches, indoor and outdoor hand railings, mailboxes, door knobs and handles, recycling and garbage chute handles, and laundry machines. Hand sanitizer stations placed in high-traffic areas may be useful, but only if they can be kept stocked, as products may be in short supply.

Cleaners and disinfectants

Transmission risk can be effectively reduced using both household **cleaners** (like soap and water) to reduce soil and the viral load on surfaces, as well as **disinfectants** that kill on contact.[10] **It is unnecessary to source expensive or specialty disinfectants, which may be needed elsewhere (e.g., in a hospital setting).** Both Health Canada[10] and the US Environmental Protection Agency[11] have recently published lists of acceptable disinfectants for SARS-CoV-2. Due to the proliferation of false claims and opportunistic marketing, consumers should look for products that have a **Drug Identification Number**, meaning that they are effective and have been approved for use in Canada.[12] Users should always follow the directions when using cleaners and disinfectants, and should never mix products to avoid the production of toxic vapours.

If disinfectants or cleaning products are in short supply, common disinfectants such as a diluted (0.5%) bleach solution, 0.5% hydrogen peroxide, or products containing 70% ethanol can inactivate the virus within 1 minute,[3,12] provided the surface remains wet for this time. Maintaining an **onsite supply** of appropriate cleaning products is advisable in case of shortages.

Personal protective equipment

The Public Health Agency of Canada does not currently specify PPE for custodial staff, beyond the gloves needed to handle disinfectants,[12] although other jurisdictions are recommending gloves, gowns, and masks.[13,14] However, management may have difficulty sourcing PPE during a pandemic. If disposable gloves are not available, the next best option is reusable gloves reserved for SARS-CoV-2 decontamination.[13] No matter what type of glove is used, staff should wash their hands **before and after** using gloves.

Enhanced cleaning measures and frequency of cleaning

The Public Health Agency of Canada and other public health organizations have provided a number of tips on cleaning public spaces during the pandemic:

- For ease and speed, **wipes** provide both cleaning and disinfection are preferred for surfaces that are not heavily soiled.[15]
- If disposable wipes or paper towel cannot be obtained, **reusable rags** can be used and then washed in hot water (60-90°C) with regular soap.[12]
- To reduce the risk of aerosolizing the virus, cleaners should **avoid dusting or sweeping**, instead using damp cloths or paper towels and wet mopping.[12]
- **Soft surfaces**, such as upholstered furniture and curtains, can be steam cleaned or isolated for 72 hours and then cleaned normally.[12,13]
- Contaminated **trash** is not being treated as infectious waste in Canada; it should be bagged and disposed of in the regular trash.[12]

Regarding the **frequency** of cleaning, most recommendations range from one to several times a day. Public Health Ontario currently recommends cleaning high touch surface twice a day in public settings,[15] although daily traffic through the area should also be considered. Building

management may also have to contend with staffing shortages amid high demand for extra cleaning service and illness amongst custodial staff.

Special use areas: elevators, laundries, and washrooms

Building management can close non-essential amenities during an outbreak, including gyms, pools, saunas, steam rooms, outdoor playgrounds, and recreation rooms. These facilities may pose health concerns for two reasons. First, such facilities are not usually supervised, nor are they staffed to the level that would be necessary to maintain them clean and sanitary. It may also be difficult or impossible to maintain physical distancing while using these facilities. Generally, if such facilities in commercial settings are closing, then similar facilities in residential housing should follow suit.

Exceptions to this are necessary facilities like elevators, shared laundries, and in some cases washrooms. **Elevators** should be **assessed for size** and the number of people that can fit inside (with a radius of 2 m); in some cases, residents may have to use the elevator one person at a time. The number of allowable occupants should be posted inside and outside the elevator (see Toronto Public Health as an example).

Laundry rooms are essential for both healthy and sick households, and may be in high demand during an outbreak. Some buildings with multiple laundries may attempt to designate "low-risk" and "at-risk" laundries for households with healthy or ill individuals, respectively. **However**, because of the difficulty identifying who is ill and ensuring their compliance with such measures, there is a risk that healthy users will then take fewer personal precautions, due to a false sense of security, and increase their risk of transmission.

Instead, a common set of simple precautions is preferred for all users (**Box 2**). It is important to note that although some health agencies recommend bagging and isolating a sick person's laundry within the home to prevent accidental handling, **it is not necessary to wash these items separately from other household items.**[12-14,16]

BOX 2: PRECAUTIONS FOR SHARED LAUNDRIES (Poster for Shared Facilities)

- Wash their hands before **and** after using the laundry;
- Wipe down the machine controls with a disinfectant before **and** after using the machine;
- Wash with soap and the warmest water possible and do not overload the machine;
- Dry items at highest temperature possible and dry them **completely;**
- Disinfect laundry hampers before re-filling with clean clothes;
- Fold clean laundry at home, not in the laundry room;
- Keep dryer doors closed when not in use to prevent back drafting;
- Avoid shaking out or hugging dirty laundry;
- Do not leave soiled clothing or baskets on top of machines;
- Do not leave cleaning residues in machines that could damage other people's clothing;
- Limit the number of people in the laundry room to ensure physical distancing; scheduling may be necessary for busy facilities.

Washrooms in common areas may or may not be considered necessary facilities. As mentioned above, disease transmission due to aerosolization of virus in feces has been previously observed during the 2002 SARS outbreak,[8] and SARS-CoV-2 patients may shed virus in their feces long after their respiratory infection appears to have resolved.[7] If common washrooms remain open, enhanced cleaning with appropriate disinfectants is advisable, washrooms should be kept well stocked with soap and paper towel, and users should be advised **to flush the toilet with the lid down**, where possible.

Precautions related to building ventilation

At present, specific changes to building ventilation, temperature, and humidity are **not** recommended in response to the COVID-19 pandemic.[17-19] However, because the role of aerosol transmission in the COVID-19 pandemic is not yet understood, it is important that building systems are **functioning as intended** to prevent ventilation problems that could worsen airborne transmission, if it is occurring.

The general objectives for preventing airborne transmission in a multi-unit residential building are to prevent air flowing from infected units into common areas, and to reduce the overall concentration of infectious particles circulating in both units and common areas. Depending on the building type and system, one or more of the following may be relevant:

- Ensure that **mechanical ventilation** is operating as intended to supply the required design ventilation rates. If ventilation rates have been reduced as an energy-saving measure, consideration should be given to returning these to normal;
- Ensure that **corridor pressurization** (if in place) is sufficient to prevent air from infected units flowing out into corridors where other residents are passing;
- Ensure that **filters** are clean. Although typical residential filters (MERV 8-13 filters)[c] are unlikely to effectively reduce airborne SARS-CoV-2, ensuring that filters are clean is important for adequate flow rates. Filters should not be upgraded without consulting a professional;
- Within individual units, the Public Health Agency of Canada recommends increasing **natural ventilation** (i.e., opening a window if weather permits) to lessen the risk of transmission between members of the same household.[22]

Many buildings have unique ventilation systems that will require assessment by a heating, ventilation, and air conditioning (HVAC) professional to determine what, if any, modifications are necessary. It has also been noted that substantially increasing air flow rates (i.e., creating turbulent air) or recirculating air without introducing more fresh air could help re-suspend

[c] Filters are categorized as to their minimum efficiency reporting value (MERV), which reflect the smallest particle size removed and how effectively it is removed.[20,21]

infectious particles or prevent them from settling.[23] Unintended effects such as these emphasize the **importance of consulting with an HVAC professional** before making modifications.

For future pandemic planning, there are a number of resources that discuss building design and various technologies that may reduce the risk of viral transmission.[23,24] The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) has also recently updated their technical guidance on airborne outbreaks, which may be of interest for both residential and other indoor settings.[25]

Precautions related to building governance

Reducing transmission in multi-unit residential housing is not only a matter of cleaning surfaces and encouraging healthy behaviours, but also adjusting standard practices to reduce prevent gatherings. For example, stratas or condominium associations are legally required to hold annual general meetings, council meetings, and hearings, typically in person. In BC, the Condominium Home Owners Association (CHOA) has prepared a useful brief on alternate means to satisfy such legal requirements, including the protocols, technology, and bylaw amendments required to hold fully electronic general meetings and prevent owners from gathering in a way that could promote disease transmission.[26]

Health promotion messaging

The implementation of enhanced sanitary measures must also be paired with health promotion communications directed at residents. Although building management cannot and should not provide health advice or recommendations, they can **reinforce the messaging** recommended by public health officials, using materials created for this purpose. Many public health agencies have produced printable health notices, such as the BCCDC's posters on physical distancing and hand-washing. The BC Government has created a useful poster to help distinguish between people who are self-isolating due to illness, due to heightened vulnerability, due to recent travel, or as a precaution.[27] This resource is useful because it advises on how or whether people from each of those categories should be accessing common areas. Links to other information or public health resources can be distributed through posters, notices, emails, social media, and mention in strata council minutes or newsletters, etc.

Because building managers have the means to communicate with residents, they may also have a role to play in **reducing social isolation**. Although physical distancing should be emphasized to reduce transmission, physical distancing **does not** mean emotional distancing. Residents should be encouraged to establish regular *check-ins* with friends, neighbours, and family via alternate means. Management may also wish to highlight mental health resources from Canadian agencies, such as the Centre for Addiction and Mental Health.

Restricting access, visitation, and privacy concerns

Physical distancing requirements mean that managers may have to take action to discourage gatherings, such as shutting down common rooms and amenities. Residents may also be asked to refrain from social visiting. Viewing homes for sale or for rent should be done virtually. However, physical distancing must also take into consideration the needs of vulnerable residents who may depend on outside assistance. For example, people who are ill or those who are self-isolating to remain healthy may rely on friends, family members, or delivery personnel to obtain necessary goods and avoid non-essential trips. Thus, although physical distancing should be encouraged, limiting access to the building could be severely detrimental to some residents.

As building residents or managers become aware of COVID-19 or other illnesses in the building, there may be pressure to restrict movement in the building or identify ill cases. However, building management should be cautious of attempting to restrict the movement of ill people, except for shutting down common spaces or non-essential amenities, and furthermore **must protect the privacy** of these individuals.[1] Local public health will manage the care and assessment of infected individuals and (typically) will inform building managers of additional measures **only if it becomes necessary to do so**.

When to institute COVID-19 precautions

The timing of instituting measures is critical. Management cannot know at any given time whether infected individuals are in the building. Asymptomatic individuals may not know themselves, and symptomatic patients have no duty to self-report to building management. Thus, it is important to initiate precautions early and aggressively, rather than taking a gradual or staged approach.

Summary

Protecting the residents of multi-unit residential properties depends, in part, on understanding the mode of SARS-CoV-2 transmission. Residents who self-isolate in their units, avoid lingering in common areas, and ride elevators alone or in very restricted groups should be protected from direct contact and respiratory droplet transmission. However, the potential for indirect contact through high-touch surfaces and shared facilities like laundries and washrooms means that building managers must take steps to ensure that those surfaces are sanitized appropriately and as frequently as necessary. Management can also play a positive role by reinforcing messaging from public health, encouraging healthy behaviours like hand-washing, and closing amenities that cannot be maintained sanitary or that cause residents to gather. By taking a broad and balanced approach, building management can greatly assist residents in reducing their overall risk of SARS-CoV-2 transmission and preventing some of the unintended negative effects of self-isolation.

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