Date: 2024-03-08	Document: Z8004

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MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
Barry Hunt / Prescientx	6.1		ge	6.1.3	Add: Consideration shall be given to adopting applicable clauses from CSA Z7000-18, General requirements for quality management and safety in perioperative settings	
Barry Hunt / Prescientx	7.2		ge	This statement is not true in all circumstances. LTC is at times particularly vulnerable to airborne transmission of CoVID, colds, flu, and RSV.	*Note: Hand hygiene is an important procedure for preventing HAIs in residents and staff. Availability of hand hygiene facilities (e.g., designated hand washing sinks and ABHRs) encourages the practice of good hand hygiene. Measures shall be considered to prevent transmission of pathogenic aerosols found in sink drains (e.g. - pseudomonas, C. auris, CPE/CREs).*	
Barry Hunt / Prescientx	7.2.1.6		ge	Sinks are routinely used for disposal despite policies prohibiting disposal & education measures about disposal. One study showed 96% of sink use in HC was for disposal. We must recognize that compliance with this is minimal and likely always will be. The danger of aerosolization of pathogens in sink drains exists whether or not fluids are disposed of in the sink so we should plan to mitigate harm from aerosolization regardless.	Hand hygiene sinks shall be engineered to mitigate the release of pathogenic bioaerosols.	

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Barry Hunt / Prescientx	7.2.2.1		ge	It's well known that hand hygiene compliance is significantly over-reported due to Hawthorne Effect and other biases. This gives a false sense of security.	Add: Measures shall be taken to mitigate over-reporting of hand hygiene compliance due to Hawthorne Effect and other biases. These measures shall be disclosed along with the hand hygiene compliance rates.	
Barry Hunt / Prescientx	7.3.3.4		ge	The availability of 95PFE Respirators for staff, residents and visitors to LTC has been limited and controversial throughout the pandemic. Everyone has the right to protect themselves, and, moreover, to determine the level of protection they feel is warranted. CA-N95 respirators need to be freely available to everyone in LTC. This also applies for protection against other airborne diseases such as seasonal flu, colds, and RSV or when resident is cohorted with other resident(s) that may be contagious from time-to-time.	Add: CA-N95 respirators shall be made readily available to staff, residents and visitors and shall be located in convenient accessible locations such as entryways, outside resident rooms, and in common areas.	
Barry Hunt / Prescientx	9.3.1.1		ge	We've learned during the pandemic that higher airflow rates are required to mitigate transmission. 4 ACH is not enough, should be 6 ACH or greater.	Add: Resident rooms, common areas and corridors shall be provided a minimum 6 ACH, 2 ACH outdoor air.	
Barry Hunt	9.3.1.4		ge	We've learned during the pandemic that	Where the HVAC system does not	

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/ Prescientx				supplementing under-ventilated spaces with loacl HEPA air purifiers significantly reduces CoVID transmission.	provide a minimum 6 ACH, portable HEPA filters or Upper Air UV may be used to provide supplemental filtration to achieve a minimum 6 eACH.	
Barry Hunt / Prescientx	9.3.1.6		ge	AIIRs are expensive, consume significant real estate, are difficult to retrofit, and require technical expertise that may not be present in a LTC facility. Upper Air UV can provide better protection than AIIR, is very inexpensive, and should be considered as an alternate.	Add: Alternatively, a properly designed Upper Air UV system may be used in lieu of an AIIR or separate space for high risk and medium risk situations.	
Barry Hunt / Prescientx	9.3.1.7		ge	Increased ventilation can be provided locally in resident rooms with HRVs, rather than opening windows.	*Note: it is not practical to maintain airflow and pressure relationships when windows are opened but local balanced HRVs could be used to supplement air exchange.*	
Barry Hunt / Prescientx	Annex F (informative) IPAC Risk Assessment		ge	"N95" is based on the U.S. NIOSH Standard. Please update the reference to "CA-N95" to reference the new Canadian CSA National Standard. We've learned we need to differentiate between medical masks suitable for splash protection and respirators, suitable for bioaerosol protection. Pls separate the two.	Masks: i) use a medical mask when indicated to protect mucous membranes of the nose and mouth during procedures and resident care activities that are likely to generate splashes or sprays of blood, body fluids, secretions or excretions (eg - wound irrigation procedures) ii) discard mask immediately after removal into appropriate receptacle and	

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					wash hands. CA-N95 Respirators: A CA-N95 shall be used to prevent inhalation of bioaerosols that may contain infectious agents transmitted via the airborne route such as SARS-CoV-2. During outbreaks or high community cases of airborne diseases such as CoVID, flu, colds, or RSV, CA-N95s shall be worn by staff and visitors continuously while inside the LTC facility. Residents shall be provided ready access to CA-N95 respirators and encouraged to wear them. A CA-N95 shall be worn by staff and visitors when in close contact with residents with any respiratory symptoms regardless of pandemic or community case levels. Discard respirator mask immediately after removal into appropriate receptacle and wash hands.	
Barry Hunt / Prescientx	8.2.3		ge	Toilet, sink and drain aerosols are well-known vectors for disease transmission in healthcare facilities. For example, SARS-CoV-2 is so prevalent in stool that wastewater signals are now used as a	8.2.3.6 Bathrooms shall incorporate engineered design measures to reduce pathogenic reservoirs and vectors of disease transmission including liberation of	

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				measure of community cases. Sinks & drains are well-known sources of CPE/CREs, pseudomonas and C. auris, Engineered measures need to be taken in resident washrooms to reduce or eliminate pathogenic reservoirs and pathways of transmission.	pathogenic bioaerosols from sinks, drains and toilets.	

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Barry Hunt / Humanity	3.1		te	**Airborne isolation room** **(AIR)** — a room that is designed, constructed, and ventilated to limit the spread of airborne micro-organisms from an infected occupant to the surrounding areas of the HCF. **Notes:** 1) *These rooms are designed for use when caring for patients requiring airborne precautions; for example, patients with known or suspected tuberculosis, primary or disseminated varicella-zoster, virus infection, or measles.* 2) *AIRs are designed to maintain negative pressurization relative to adjacent areas.* 3) *See Clause 6.10.4.2.*	**Airborne isolation room** **(AIR)** — a room that is designed, constructed, and ventilated to limit the spread of rare or emerging airborne, or suspected airborne, micro-organisms from an infected occupant to the surrounding areas of the HCF and the community. **Notes:** 1) *These rooms are designed for use when caring for patients requiring airborne precautions; for example, patients with known or suspected Avian Flu or "Disease X".* 2) *AIRs are designed to maintain negative pressurization relative to adjacent areas.* 3) *See Clause 6.10.4.2.*	
Barry Hunt / Humanity	3.1		te	**Combination AIR/PER** — a room that is designed, constructed, and ventilated to limit the spread of airborne micro-organisms from an infected occupant to the surrounding areas of the HCF, and at the same time, to limit the introduction of airborne micro-organisms from the surrounding areas to an immunocompromised or immunosuppressed occupant. **Notes:**	**Combination AIR/PER** — a room that is designed, constructed, and ventilated to limit the spread of airborne micro-organisms from an infected occupant to the surrounding areas of the HCF, and at the same time, to limit the introduction of rare or emerging airborne, or suspected airborne, micro-organisms from the surrounding areas to an immunocompromised or immunosuppressed occupant.	

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				1) *These rooms are designed for use when caring for patients requiring both airborne precautions and environmental protection; for example, bone marrow transplant patients with known or suspected tuberculosis.* 2) *Combination AIR/PERs are designed to maintain positive pressurization in the patient room with a negatively pressurized anteroom.* 3) *See Clause 6.10.4.3.3.*	**Notes:** 1) *These rooms are designed for use when caring for patients requiring both airborne precautions and environmental protection; for example, bone marrow transplant patients with known or suspected Avian Flu or "Disease X".* 2) *Combination AIR/PERs are designed to maintain positive pressurization in the patient room with a negatively pressurized anteroom.* 3) *See Clause 6.10.4.3.3.*	
Barry Hunt / Humanity	3.1		te	**High-threat pathogen airborne isolation room (AIR) –** An AIR with additional design elements including separate anterooms for entry and exit to accommodate highly infectious patients with pathogens such as haemorrhagic fever and pneumonic plague. The flow of staff, equipment and waste proceed in one direction only to ensure there is no cross-over between clean and dirty activities. *Note: The enhanced AIR may also include an ensuite 3-piece washroom, a dirty utility and a staff change room.*	**High-threat pathogen airborne isolation room (AIR) –** An AIR with additional design elements including separate anterooms for entry and exit to accommodate highly infectious patients with pathogens of severe consequence such as haemorrhagic fever and pneumonic plague. The flow of staff, equipment and waste proceed in one direction only to ensure there is no cross-over between clean and dirty activities. *Note: The enhanced AIR may also include an ensuite 3-piece washroom, a dirty utility and a staff change room.*	
Barry Hunt	3.1		te	**Patient care area** — an area	**Patient care area** — an area	

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/ Humanity				intended primarily for diagnosis, therapy, or care. **Notes:** 1) *The HCF administration is responsible for determining whether an area should be classified as a patient care area and, if so, whether it is Type I, II, or III.* 2) *Bathrooms and washrooms are not always considered part of the patient care area.*	intended primarily for diagnosis, therapy, or care. **Notes:** 1) *The HCF administration is responsible for determining whether an area should be classified as a patient care area and, if so, whether it is Type I, II, or III.* 2) *Bathrooms and washrooms are considered part of the patient care area.*	
Barry Hunt / Humanity	5.1.2		te	5.1.2 The design process for the HVAC system shall involve the HCF's MDT through a documented process with formal communication. **Notes:** 1) *The consultation process is intended to identify potential HVAC issues/risks that could affect the clinical environment, which might not otherwise have been foreseen.* 2) *The MDT should include technical, clinical, and administrative considerations.*	5.1.2 The design process for the HVAC system shall involve the HCF's MDT through a documented process with formal communication. **Notes:** 1) *The consultation process is intended to identify potential HVAC issues/risks that could affect the clinical environment, which might not otherwise have been foreseen.* 2) *The MDT should include technical, clinical, and administrative considerations.* *3) The MDT should include Subject Matter Expert(s) in Engineered Infection Prevention including bioaerosol generation, transmission and mitigation*	

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Barry Hunt / Humanity	5.1.3		te	5.1.3 During the design process, alternative means of achieving the operating objectives should be evaluated and specific recommendations presented. Any evaluation of HVAC system alternatives shall include risks (including events that potentially threaten business continuity), surge requirements, flexibility and adaptability for future changes. Life-cycle cost, when used in the evaluation, should include capital, operating, maintenance, replacement, removal, disruption, and disposal costs.	5.1.3 During the design process, alternative means of achieving the operating objectives should be evaluated and specific recommendations presented. Any evaluation of HVAC system alternatives shall include risks (including events that potentially threaten business continuity), impact on exposure to pathogens, surge requirements, flexibility and adaptability for future changes. Life-cycle cost, when used in the evaluation, should include capital, operating, maintenance, replacement, removal, disruption, disposal costs, risk of infection, patient outcomes, average length of stay, and impact on operational revenue and costs of providing patient care.	
Barry Hunt / Prescientx	6.6.3.1		te	6.6.3.1 General Internally mounted (in-duct and/or in the air handling unit) disinfection systems using ultraviolet germicidal irradiation (UVGI systems) should be considered as a supplemental IPAC measure for ventilation and filtration of particulate matter in HVAC systems. The IDT should evaluate the most recent available clinical evidence	6.6.3.1 General Ultraviolet germicidal irradiation (UVGI systems) should be installed in air handling units to prevent bacterial and mold growth and to reduce fouling of coils. **Notes:** *1) UVGI systems have been shown to be useful in reducing bioburden on cooling*	

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				when deciding where to install UV systems. **Notes:** 1) *Refer to CSA Z8000 for various application types for UVGI disinfection technology (applied to air and surfaces in spaces, predominant wavelength, lamp types, exposure, etc.)* 2) *UVGI systems have been shown to be useful in reducing bioburden on cooling coils. They have also been demonstrated to reduce the number of active micro-organisms in ventilation air when installed in ductwork.* 3) *UVGI systems are intended as a supplement to normal good practice for protecting air quality. UV systems are not in any way to be used as a substitute for regular HVAC system maintenance, including the monitoring and replacement of filters, and periodic cleaning of coils and ductwork.* 4) See ASHRAE Handbook – 2019 HVAC Applications, Ch. 62 Ultraviolet and surface treatment.	*coils. Reducing bioburden and biofilm on cooling coils has been demonstrated to preserve energy efficiency, reduce operational and maintenance costs and reduce the risk of seeding bacteria or mold throughout the HVAC distribution system with a single fault condition such as filter bypass.* 2) *UVGI systems are intended as a supplement to normal good practice for protecting air quality. UV systems are not in any way to be used as a substitute for regular Air Handling Unit system maintenance, including the monitoring and replacement of filters, and periodic cleaning of coils.* *3) See ASHRAE Handbook – 2019 HVAC Applications, Ch. 62 Ultraviolet and surface treatment.* 6.6.3.2 Ultraviolet germicidal irradiation (UVGI systems) should be considered for installation into ducts, especially in critical care areas, as a supplemental IPAC measure for ventilation and filtration of particulate matter in HVAC systems. The MDT should evaluate the patients and areas of greatest risk of negative	

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					outcomes due to pathogen exposure when deciding where to install UV systems. BMT, Oncology, Malignant Haematology, NICU and IVF are examples of clinical areas that may warrant special consideration for UVGI. **Notes:** *1) UVGI has been demonstrated to reduce the number of active micro-organisms in ventilation air when installed in ductwork.* *2) Refer to CSA Z8000 for various application types for UVGI disinfection technology (applied to air and surfaces in spaces, predominant wavelength, lamp types, exposure, etc.* *3) See ASHRAE Handbook – 2019 HVAC Applications, Ch. 62 Ultraviolet and surface treatment.*	
Barry Hunt / Prescientx	6.8.4		te	6.8.4	add: 6.8.4.5 Duct-mounted humidifiers shall be used where necessary to maintain a minimum RH of 40% in clinical areas to reduce airborne transmission of disease in areas occupied by patients especially susceptible to infection or susceptible to	

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					severe outcome from infection. For example, BMT, ICU, NICU, Burn Unit, Oncology, PER and other areas where immuno-compromised patients may be treated. **Notes:** *1) The risk of airborne infection has been demonstrated to double when the RH drops from 40% to 30%.*	
Barry Hunt / Humanity	6.10.4.2.1		te	6.10.4.2.1 AIRs shall have a) inward directional airflow from adjacent spaces to the room; b) sufficient differential between supply and exhaust airflows to maintain a normal operating pressure gradient of 7.5 Pa, measured between the room and the corridor (negative pressure); c) directional airflow within the room such that clean supply air flows first to parts of the room where workers or visitors are likely to be present, and then flows across the infection source (i.e., patient area) to the exhaust; d) non-aspirating diffusers; e) low-level exhaust near the head of the patient bed; f) any washrooms that are connected to the	6.10.4.2.1 AIRs shall have a) inward directional airflow from adjacent spaces to the room; b) sufficient differential between supply and exhaust airflows to maintain a normal operating pressure gradient of 7.5 Pa, measured between the room and the corridor (negative pressure); c) directional airflow within the room such that clean supply air flows first to parts of the room where workers or visitors are likely to be present, and then flows across the infection source (i.e., patient area) to the exhaust; d) non-aspirating diffusers mounted no higher than 0.5m above finished floor; e) ceiling-level exhaust near the head of the patient bed;	

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				AIR exhausted using the same exhaust system as the room; g) all air exhausted to the outdoors; h) HEPA filtration of exhaust in cases where exhaust air is not discharged clear of building openings or where a risk of recirculation exists (see Table 2); i) audible and visual alarms as specified in Clause 6.10.4.1.5; and j) exhaust fans, alarms, and controls supplied by the vital or delayed vital branch of the essential electrical system.	f) any washrooms that are connected to the AIR exhausted using the same exhaust system as the room; g) all air exhausted to the outdoors; h) HEPA filtration of exhaust in cases where exhaust air is not discharged clear of building openings or where a risk of recirculation exists (see Table 2); i) audible and visual alarms as specified in Clause 6.10.4.1.5; and j) exhaust fans, alarms, and controls supplied by the vital or delayed vital branch of the essential electrical system. Notes: *1) CFD analysis demonstrates that typical AIIRs with 12 ACH, ceiling mounted diffusers and ceiling or wall-mounted exhausts located away from the patient bed result in repeated circulation and high level of exposure of staff and visitors to pathogens exhaled by the patient.* *2) CFD analysis demonstrates that typical AIIRs with 12 ACH, ceiling mounted diffusers and ceiling mounted exhaust above the patient bed results in virtually no pathogen circulation or exposure of staff and visitors to*	

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					pathogens exhaled by the patient. *3) Low level supply diffusers and ceiling mounted exhaust (displacement ventilation) can reduce exposure of occupants to exhaled pathogens from all staff, visitors and patients.*	
Barry Hunt / Humanity	6.10.4.3.3		te	6.10.4.3.3 Combination AIR/PE room PERs that also act as an AIR shall be equipped with an anteroom. This anteroom shall be ventilated, and the pressure shall be maintained negative to both the combination PE/AI room and the corridor. Air shall flow from the room into the anteroom, and from the corridor into the anteroom. The air removed from the room, anteroom and washroom shall be exhausted to the outdoors. **Note:** *In cases where an immunocompromised patient is also affected by an infectious disease (e.g., tuberculosis), an anteroom acts as a barrier against potential contaminants entering the room as well as escaping the room.*	6.10.4.3.3 Combination AIR/PE room PERs that also act as an AIR shall be equipped with an anteroom. This anteroom shall be ventilated, and the pressure shall be maintained negative to both the combination PE/AI room and the corridor. Air shall flow from the room into the anteroom, and from the corridor into the anteroom. The air removed from the room, anteroom and washroom shall be exhausted to the outdoors. **Note:** *In cases where an immunocompromised patient is also affected by a rare or emerging infectious disease (e.g., Avian Flu or "Disease X"), an anteroom acts as a barrier against potential contaminants entering the room as well as escaping the room.*	
Barry Hunt / Humanity	6.10.5		te	6.10.5 Outbreak Control Zones Where outbreak control zones have been	6.10.5 Outbreak Control Zones Where outbreak control zones have been	

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				designated, the following shall be provided a) Anterooms at the entry point(s) of the zone. b) High level air separation between the corridor outside the zone and the patient rooms within the zone. c) Directional airflow within the zone with the pressure gradient such that the patient rooms are the most negative. d) Staff refuge areas within the outbreak control zone that are positively pressured with medium level air separation from the surrounding spaces. e) Exhausting of all air to the outdoors when in outbreak control mode. f) Visual indication outside the entry anteroom that outbreak control zone mode has been initiated. g) An auditory and visual alarm indicating that the pressure relationship or airflow is not being maintained at the nurse's station or other points of continuous supervision. h) Monitoring of the outbreak control zone mode by a central alarm and control system. i) An operational mechanism to ensure set protocols are followed when initiating or disabling outbreak control zone mode.	designated, the following shall be provided a) Anterooms at the entry point(s) of the zone. b) High level air separation between the corridor outside the zone and the patient rooms within the zone. c) Directional airflow within the zone with the pressure gradient such that the patient rooms are the most negative. d) Staff refuge areas within the outbreak control zone that are positively pressured with medium level air separation from the surrounding spaces and displacement ventilation equivalent to 12 ACH including wall mount diffusers less than 0.5m above finished floor and ceiling mounted exhaust(s). e) Exhausting of all air to the outdoors when in outbreak control mode. f) Visual indication outside the entry anteroom that outbreak control zone mode has been initiated. g) An auditory and visual alarm indicating that the pressure relationship or airflow is not being maintained at the nurse's station or other points of continuous supervision. h) Monitoring of the outbreak control	

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					zone mode by a central alarm and control system. i) An operational mechanism to ensure set protocols are followed when initiating or disabling outbreak control zone mode. Notes: *1) Low level supply diffusers and ceiling mounted exhaust (displacement ventilation) can reduce exposure of occupants to exhaled pathogens allowing staff to unmask, eat or hydrate in a safer environment.*	
Barry Hunt / Humanity	6.11.2.3		te	6.11.2.3 This Standard does not address displacement ventilation. If a system using displacement ventilation is being considered, engineering studies shall be conducted to confirm whether the system can maintain the values specified in Table 1. Displacement ventilation shall not be used unless these studies demonstrate efficacy. The use of displacement ventilation shall not be used as a rationale for decreasing air exchange rates unless the engineering studies have demonstrated an equivalent level of safety.	6.11.2.3 Displacement ventilation has been demonstrated to be an effective strategy to reduce occupant exposure to exhaled pathogens important for infection prevention. Lower air exchange rates used in displacement ventilation can provide reduced levels of pathogen exposure. The air exchange rate values specified in Table 1 do not include equivalent values for displacement ventilation. Therefore, reduced air exchange levels should only be considered if validated by an engineering	

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					study including CFD or literature review and after a review of the risk benefit by the MDT. Note: *1) The additional reduction in pathogen exposure using the same air exchange rates of Table 1 will likely serve the healthcare facility well as more transmissible and more virulent airborne diseases emerge in future.*	
Barry Hunt / Humanity	6.11.3.1		te	6.11.3.1 Air shall be supplied from the ceiling in Type I areas. The air supply for ORs, delivery rooms, and other rooms used for invasive procedures shall be provided through non-aspirating diffusers centred over the work area. **Note:** *Non-aspirating diffusers are classified as ASHRAE Group E and are typically called laminar flow diffusers (see ANSI/ASHRAE/ASHE 170). They are engineered to provide a uniform, unidirectional low velocity air pattern below the diffuser so as to minimize entrainment or mixing of room air. This is not to be confused with laminar flow rooms typically used in clean room applications where high volumes and velocities of air*	6.11.3.1 Air shall be supplied from the ceiling or from wall-mount displacement diffusers in Type I areas. The air supply for ORs, delivery rooms, and other rooms used for invasive procedures shall only be provided through non-aspirating diffusers centred over the work area if HEPA filtered or disinfected with UV. Otherwise, displacement ventilation shall be used with wall-mounted diffusers mounted at least 0.5m above finished floor and ceiling mount exhaust vents located at least over the work area. The determination whether to use ceiling diffusers or displacement ventilation should be made based on infection prevention by the MDT including subject	

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				are used in conjunction with HEPA filters with the objective of achieving very low particle counts. The laminar flow room approach has been applied in ORs; however, studies have not shown measurable benefits.	matter experts in aerosol science, CFD and engineered infection prevention. **Note:** **1)** *Non-aspirating diffusers are classified as ASHRAE Group E and are typically called laminar flow diffusers (see ANSI/ASHRAE/ASHE 170). They are engineered to provide a uniform, unidirectional low velocity air pattern below the diffuser so as to minimize entrainment or mixing of room air. This is not to be confused with laminar flow rooms typically used in clean room applications where high volumes and velocities of air are used in conjunction with HEPA filters with the objective of achieving very low particle counts. The laminar flow room approach has been applied in ORs; however, studies have not shown measurable benefits.* *2) Airborne contaminants can be entrained into the airstream from ceiling diffusers directly into the work area including surgical sites leading to infection. In particular, exhaled bioaerosols, pathogens located on the surface of healthcare workers including skin, hair and clothing, and pathogens re-aerosolized from overhead medical*	

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MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					equipment including lights, monitors, imaging equipment and articulating arms. *3) Displacement ventilation could be a particularly effective infection prevention strategy in ORs which generally feature low ambient temperature, high ceilings, large volumes and crowded work areas.*	
Barry Hunt / Humanity	6.11.3.3		te	6.11.3.3 AIR anterooms shall be provided for ORs used for patients who have an airborne infectious disease (e.g., tuberculosis). The AIR anteroom shall be ventilated, and the pressure shall be maintained negative to both the OR and the contiguous space. Air shall flow from the OR into the AIR anteroom and from the corridor into the AIR anteroom. The air removed from both the AIR anteroom and the OR shall be exhausted to the outdoors. **Note:** *Facility planners should consult infection control agencies to determine if the facility needs an OR with an AIR anteroom (e.g., due to a higher annual volume of patients with airborne disease who might require surgery).*	6.11.3.3 AIR anterooms shall be provided for ORs used for patients who have a rare or emerging airborne, or suspected airborne, infectious disease (e.g., Avian Flu, "Disease X"). The AIR anteroom shall be ventilated, and the pressure shall be maintained negative to both the OR and the contiguous space. Air shall flow from the OR into the AIR anteroom and from the corridor into the AIR anteroom. The air removed from both the AIR anteroom and the OR shall be exhausted to the outdoors. **Note:** *Facility planners should consult subject matter experts in bioaerosol science and engineered infection prevention to determine if the facility needs an OR with an AIR anteroom (e.g.,*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					due to a higher annual volume of patients with airborne disease who might require surgery).	
Barry Hunt / Humanity	6.11.5.7		te	6.11.5.7 Environmental controls should be used to protect staff from infectious or contaminated patients at the first point of entry into an emergency care service (i.e., security, triage, and registration). Directional airflow from behind the health care and security personnel can help to mitigate the risk of exposure. These environmental controls may be used to supplement procedural screening and other mechanisms such as signage and public communication.	6.11.5.7 Environmental controls should be used to protect staff from infectious or contaminated patients at the first point of entry into an emergency care service (i.e., security, triage, and registration). Directional airflow from behind the health care and security personnel can help to mitigate the risk of exposure. These environmental controls may be used to supplement procedural screening and other mechanisms such as signage and public communication. **Notes:** *1) Displacement ventilation in emergency departments and waiting rooms could be a good strategy to reduce exposure to pathogens to patients, staff, and visitors in crowded spaces.*	
Barry Hunt / Humanity	8.7.1		te	8.7.1 HCF management shall have written contingency plans for an event that potentially disrupts business continuity to	8.7.1 HCF management shall have written contingency plans for an event that potentially disrupts business continuity to	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
				allow for the building's HVAC system to be a) "buttoned down" in the event of an external incident (e.g., chemical leak, forest fire); and b) "opened up" in the event of an internal incident (e.g., chemical leak or smoke inside the building). Such plans shall contain procedures for return to normal services following an event that potentially disrupts business continuity. **Notes:** 1) *See Clause 6.16 for design considerations and requirements for managing events that potentially disrupts business continuity.* 2) *Standby fuel should be cycled into use to avoid fouling of the fuel; however, there should always be sufficient fuel on site to meet the requirements of CSA Z8000.*	allow for the building's HVAC system to be a) "buttoned down" in the event of an external incident (e.g., chemical leak, forest fire); and b) "opened up" in the event of an internal incident (e.g., chemical leak or smoke inside the building). Such plans shall contain procedures for return to normal services following an event that potentially disrupts business continuity. **Notes:** 1) *See Clause 6.16 for design considerations and requirements for managing events that potentially disrupts business continuity.* *2) In 2023, fifteen times more forest acreage burned due to wildfires in Canada than the 20 year average. Smoke days were a regular occurrence throughout much of Canada. The trend to have more smoke days affecting Canada will continue as the climate crisis continues to accelerate and contingency plans should reflect that.* *3) Standby fuel should be cycled into use to avoid fouling of the fuel; however, there should always be sufficient fuel on*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					site to meet the requirements of CSA Z8000.	
Barry Hunt / Humanity	8.7.2		te	8.7.2 Under emergency conditions involving an external event, the outdoor air intake rate should be reduced, but not below the values specified in Table 1. If it is necessary to provide fewer air changes and/or reduce the outdoor air rate to lower than specified in Table 1, it shall be at the direction of the HCF administration and in accordance with the contingency plans for coping with events that potentially disrupts business continuity as well as applicable requirements. **Notes:** 1) *See Clauses 4.6 and 6.16 for information on business continuity.* 2) *Emergency conditions include unexpected equipment failure and unusual outdoor conditions (such as a forest fire or chemical spill near the HCF).* 3) *Applicable requirements can include federal, provincial/territorial, or municipal regulations.* 4) *See Clause 8.2.5.1.3*	8.7.2 Under emergency conditions involving an external event, the outdoor air intake rate should be reduced, but not below the values specified in Table 1. If it is necessary to provide fewer air changes and/or reduce the outdoor air rate to lower than specified in Table 1, it shall be at the direction of the HCF administration and in accordance with the contingency plans for coping with events that potentially disrupts business continuity as well as applicable requirements. **Notes:** 1) *See Clauses 4.6 and 6.16 for information on business continuity.* 2) *Emergency conditions include unexpected equipment failure, wildfires and unusual outdoor conditions (such as a chemical spill near the HCF).* *3) Wildfire smoke should no longer be considered an unusual event. In 2023, fifteen times more forest acreage burned due to wildfires in Canada than the 20 year average. Smoke days were a regular occurrence throughout much of Canada.*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					The trend to have more smoke days affecting Canada will continue as the climate crisis continues to accelerate and contingency plans should reflect that. 4) *Applicable requirements can include federal, provincial/territorial, or municipal regulations.* 5) *See Clause 8.2.5.1.3*	
Barry Hunt / Humanity	8.8.3		te	8.8.3 Selection of portable air cleaners Selection of portable air cleaners for recirculation shall a) utilize a gasketed HEPA filter for particulate removal. Such HEPA filter cleaners shall utilize a mechanical clamping mechanism sealing the HEPA onto the frame of the unit with enough pressure to eliminate any air bypassing the filter; b) not be used for odour, VOC or gas removal. Carbon filtration shall be used for odour, VOC or gas removal in accordance with Table 6; c) have a stated air flow rating based on an operational unit including all filters being installed; d) be approved in accordance with the	8.8.3 Selection of portable air cleaners Selection of portable air cleaners for recirculation shall a) consider the combination of flow rate, filter efficiency, noise level and form factor to optimize CADR while imposing the least possible disruption to occupants b) not be used for odour, VOC or gas removal. Carbon filtration shall be used for odour, VOC or gas removal in accordance with Table 6; c) have a stated air flow rating based on an operational unit including all filters being installed; d) be approved in accordance with the Canadian Electrical Code; e) not generate ozone;	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
				Canadian Electrical Code; e) not generate ozone; f) generate noise levels of 55 dB or less at maximum speed per individual unit; g) achieve a minimum of the air changes specified in Table 1; h) only use a filter's CADR for selection provided all of the filtration elements listed in 8.8.3 a) and 8.8.3 b) are installed; i) complete their energy consumption comparison based on the unit containing the filters listed in 8.8.3 a) and/or 8.8.3 b) while running at equivalent air flow; and j) consider the warranty and filter replacement costs	f) generate noise levels of 55 dB or less at maximum speed per individual unit; g) achieve a minimum of the air changes specified in Table 1; h) only use a filter's CADR for selection provided all of the filtration elements listed in 8.8.3 a) and 8.8.3 b) are installed; i) complete their energy consumption comparison based on the unit containing the filters listed in 8.8.3 a) and/or 8.8.3 b) while running at equivalent air flow; and j) consider the warranty and filter replacement costs **Note:** *1) Portable air filter units utilizing PC fans and MERV 11 to MERV13 filters have been demonstrated to provide the highest CADR at the lowest sound level.*	
Barry Hunt / Humanity	8.8.4		te	8.8.3 Selection of portable air cleaners Selection of portable air cleaners for recirculation shall f) generate noise levels of 55 dB or less at maximum speed per individual unit;	8.8.3 Selection of portable air cleaners Selection of portable air cleaners for recirculation shall f) generate noise levels of 45 dB or less at maximum speed per individual unit;	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
Barry Hunt / Humanity	A.3.2.2		te	A.3.2.2 The design team shall consult medical, nursing, infection control, and technical staff members, including those involved in operations and maintenance. This interaction conveys design ideas to hospital staff and details concerning patient care to the design team members.	A.3.2.2 The design team shall consult medical, nursing, infection control, subject matter experts in bioaerosol science and engineered infection prevention, and technical staff members, including those involved in operations and maintenance. This interaction conveys design ideas to hospital staff and details concerning patient care to the design team members.	
Barry Hunt / Humanity	A.3.5		te	A.3.5 Cost implications During this stage, the cost implications of each decision shall be documented. Proper cost estimation enhances the quality of decision making, leading to greater long-term efficiencies.	A.3.5 Cost implications During this stage, the cost implications of each decision shall be documented. Proper cost estimation enhances the quality of decision making, leading to greater long-term efficiencies. Cost estimation shall include the impact on operations based on airborne transmission of disease to patients and staff within the healthcare facility. **Notes:** *1) Costs may include staff labour shortages, costs of outsourced temporary staff, especially nurses, increased average length of stay due to infection, increased treatment costs, reduced revenue due to reduced throughput, lack*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					of bed availability, and backed up emergency departments.	
Barry Hunt / Humanity	A.4		te	A.4 Conceptual design During this stage, the essential characteristics of the HVAC systems shall be determined and the design intent, space requirements, budget limitations, and design schedule shall be confirmed. Sketches and a brief conceptual report shall be produced and presented to the design team and hospital staff.	A.4 Conceptual design During this stage, the essential characteristics of the HVAC systems shall be determined and the design intent, space requirements, budget limitations, infection prevention targets, and design schedule shall be confirmed. Sketches and a brief conceptual report shall be produced and presented to the design team and hospital staff. **Note:** *1) At this stage the decision should be made whether and where to deploy new strategies to significantly reduce airborne transmission of disease affecting patients, staff and visitors like displacement ventilation, upper air UV, and Far UV.* *2) The SARS-CoV-2 pandemic has demonstrated that standard HVAC design is not protective enough against highly transmissible airborne pathogens.* *3) More highly transmissible airborne pathogens are emerging and will be significant threats in the future. For example, Avian Flu and "Disease X".*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
Barry Hunt / Humanity	A.5		te	A.5 Preliminary design Tasks during the preliminary design stage shall include a) preparing a preliminary budget for HVAC work based on requirements and data; b) meeting with the HCF during preparation of drawings to determine i) the basic layout of heating, ventilating, and air-conditioning systems; ii) the types of mechanical equipment and materials to be used; iii) the allocation of suitable space for boiler rooms, fan rooms, ducts, piping, and other major mechanical installations; and iv) the design criteria for the control of the atmospheric and environmental requirements relating to the design; c) preparing design criteria based on HVAC requirements and obtaining the HCF's approval; d) providing scale model simulations or testing in cases where sources of contamination and their flow patterns are not obvious. Such cases can include complex building structures, inner city locations, and areas with extremely diverse climatic conditions;	A.5 Preliminary design Tasks during the preliminary design stage shall include a) preparing a preliminary budget for HVAC work based on requirements and data; b) meeting with the HCF during preparation of drawings to determine i) the basic layout of heating, ventilating, and air-conditioning systems; ii) the types of mechanical equipment and materials to be used; iii) the allocation of suitable space for boiler rooms, fan rooms, ducts, piping, and other major mechanical installations; and iv) the design criteria for the control of the atmospheric and environmental requirements relating to the design; v) the design criteria to limit airborne transmission of disease in each area of the healthcare facility c) preparing design criteria based on HVAC requirements and obtaining the HCF's approval; d) providing scale model simulations or testing in cases where sources of contamination and their flow patterns are not obvious. Such cases can include	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
				e) proposing the most practical service arrangements from details provided by the HCF, municipal authorities, or utility companies; f) carrying out preliminary design functions; and g) providing the HCF with information on items that might affect the work of other trades	complex building structures, inner city locations, and areas with extremely diverse climatic conditions; e) proposing the most practical service arrangements from details provided by the HCF, municipal authorities, or utility companies; f) carrying out preliminary design functions; and g) providing the HCF with information on items that might affect the work of other trades **Note:** *1) At this stage the decision should be made where to deploy engineered infection prevention strategies to significantly reduce airborne transmission of disease affecting patients, staff and visitors like displacement ventilation, upper air UV, AutoUV, Far UV and minimum 40% relative humidity.* *2) The SARS-CoV-2 pandemic has demonstrated that standard HVAC design is not protective enough against highly transmissible airborne pathogens to prevent a significant increase in healthcare acquired infections.* *3) More highly transmissible airborne pathogens are emerging and will be*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					significant threats in the future. For example, Avian Flu and "Disease X".	
Barry Hunt / Humanity	A.6		te	A.6 Detailed design Tasks during the detailed design stage shall include a) preparing contract drawings after preliminary drawings have been finalized and the preliminary mechanical design has been approved. Such contract specifications shall include i) drawings, usually at a scale of 1:100 or 1:50; ii) a separate set of drawings for the heating, ventilating, and air-conditioning system; iii) schematics and diagrams for all major systems with notes to describe the function of controls; iv) symbol lists for all equipment, accessories, piping, and duct systems; v) floor plan layouts for all piping and duct systems, generally at a scale of 1:100 or 1:50, that show 1) complete duct and pipe sizing; and 2) sizes, types, locations, and capacities of all supply and exhaust diffusers and grilles; vi) supplementary details for boiler rooms,	A.6 Detailed design Tasks during the detailed design stage shall include a) preparing contract drawings after preliminary drawings have been finalized and the preliminary mechanical design has been approved. Such contract specifications shall include i) drawings, usually at a scale of 1:100 or 1:50; ii) a separate set of drawings for the heating, ventilating, and air-conditioning system; iii) schematics and diagrams for all major systems with notes to describe the function of controls; iv) symbol lists for all equipment, accessories, piping, and duct systems; v) floor plan layouts for all piping and duct systems, generally at a scale of 1:100 or 1:50, that show 1) complete duct and pipe sizing; and 2) sizes, types, locations, and capacities of all supply and exhaust diffusers and grilles;	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
				equipment rooms, fan rooms, and congested areas, as needed to avoid conflict in the field. In general, such details shall be drawn at a scale of 1:50 or larger and shall show a plan view and elevation of equipment together with a sufficient number of cross-sections to clarify the work; **Note:** *Detailed drawings should take into account the space requirements for ancillary electrical equipment such as starters and harmonic filters.* vii) piping information in single-line detail except where it is necessary to show the arrangement and clearance of piping in header trenches and pipe chases as well as for tight or close-coupled equipment. In such cases, the piping shall be shown in double-line detail with appropriate valves and fittings; and viii) schedules indicating capacities and performance details for fans, air handling units, pumps, etc. Specifications shall include, where necessary, a detailed outline of the balancing procedure and an allowance in the contract for the proper balancing of all heating, ventilation, and air-conditioning systems;	vi) supplementary details for boiler rooms, equipment rooms, fan rooms, and congested areas, as needed to avoid conflict in the field. In general, such details shall be drawn at a scale of 1:50 or larger and shall show a plan view and elevation of equipment together with a sufficient number of cross-sections to clarify the work; **Note:** *Detailed drawings should take into account the space requirements for ancillary electrical equipment such as starters and harmonic filters.* vii) piping information in single-line detail except where it is necessary to show the arrangement and clearance of piping in header trenches and pipe chases as well as for tight or close-coupled equipment. In such cases, the piping shall be shown in double-line detail with appropriate valves and fittings; and viii) schedules indicating capacities and performance details for fans, air handling units, pumps, etc. Specifications shall include, where necessary, a detailed outline of the balancing procedure and an allowance in the contract for the proper balancing of all heating, ventilation, and	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
				b) designing all HVAC installations to comply with the written requirements of authorities having jurisdiction; c) during the preparation of working drawings, providing the HCF and other consultants with a reasonable number of progress prints for their use and assisting in the coordination of their work with that of the HCF and other consultants; d) coordinating the design with that of the other consultants and with the requirements of the HCF; e) preparing a revised budget for HVAC work based on accurate and updated information; f) preparing a specification for all work shown on drawings and for functions for which the HVAC is responsible. Specifications shall i) be complete, clear, and concise, with a statement of the general scope of the work and an adequate description of the various classes of work under different subheadings; ii) have a table of contents identifying each subheading; iii) use standard terms for materials and processes that are the same as those used in	air-conditioning systems; b) designing all HVAC installations to comply with the written requirements of authorities having jurisdiction; c) during the preparation of working drawings, providing the HCF and other consultants with a reasonable number of progress prints for their use and assisting in the coordination of their work with that of the HCF and other consultants; d) coordinating the design with that of the other consultants and with the requirements of the HCF; e) preparing a revised budget for HVAC work based on accurate and updated information; f) preparing a specification for all work shown on drawings and for functions for which the HVAC is responsible. Specifications shall i) be complete, clear, and concise, with a statement of the general scope of the work and an adequate description of the various classes of work under different subheadings; ii) have a table of contents identifying each subheading; iii) use standard terms for materials and	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
				the plans; and iv) be in a format agreed to by the HCF; g) providing the HCF with all conditions governing unit prices, alternative prices, and separate prices that are to be submitted by the contractor; h) assisting the HCF in answering queries raised by the bidding contractors during the tendering period; i) advising the HCF on the selection of HVAC contractors; and j) making contractual arrangements for the supply of final drawings and specifications in accordance with the requirements of the contract between the prime consultant and the HCF.	processes that are the same as those used in the plans; and iv) be in a format agreed to by the HCF; g) providing the HCF with all conditions governing unit prices, alternative prices, and separate prices that are to be submitted by the contractor; h) assisting the HCF in answering queries raised by the bidding contractors during the tendering period; i) advising the HCF on the selection of HVAC contractors; and j) making contractual arrangements for the supply of final drawings and specifications in accordance with the requirements of the contract between the prime consultant and the HCF. k) the preparation and sign-off of a detailed plan to mitigate airborne transmission of disease due to highly transmissible pathogens being endemic in the community and in the healthcare facility 1) The plan shall be developed in consultation with subject matter experts in bioaerosol science and engineered infection prevention 2) the plan shall identify	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					areas of concern and engineering strategies to mitigate 3) the plan shall set measurable targets for acceptable levels of bioburden, aerosolization, and risk of pathogen exposure due to inhalation and deposition 4) the plan shall detail the engineered infection measures to be deployed **Note:** *1) Engineered infection prevention strategies can significantly reduce airborne transmission of disease affecting patients, staff and visitors. Strategies include but are not limited to displacement ventilation, upper air UV, AutoUV, Far UV and minimum 40% relative humidity.* *2) Patients in healthcare facilities are far more vulnerable to airborne diseases such as SARS-CoV-2. Mortality rates can be up to 100 times greater than the general population.* *3) The SARS-CoV-2 pandemic has demonstrated that standard HVAC design is not protective enough against highly transmissible airborne pathogens to*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					prevent a significant increase in healthcare acquired infections. *4) More highly transmissible airborne pathogens are emerging and will be significant threats in the future. For example, Avian Flu and "Disease X".*	
Barry Hunt / Humanity	6.1.1		te	6.1.1 Temperature, relative humidity, relative pressurization, and air flow HVAC systems shall be designed and constructed to provide the temperature, relative humidity, relative pressurization, and air flow specified in Table 1. The HVAC parameters in Table 1 shall be applied based on the function of the room or area and the activities that will take place there, regardless of the name given to the room or area.	6.1.1 Temperature, relative humidity, relative pressurization, and air flow HVAC systems shall be designed and constructed to provide the temperature, relative humidity, relative pressurization, and air flow specified in Table 1. The HVAC parameters in Table 1 shall be applied based on the function of the room or area and the activities that will take place there, regardless of the name given to the room or area. Relative humidity in patient care areas shall be maintained at a minimum of 40%. **Note:** *1) Healthcare acquired infections have been demonstrated to double when RH drops from 40% to 30%* **PS - I couldn't find Table 1 in the online Public Review draft but it should be updated there as well**	

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Barry Hunt / Humanity	6.9.1		te	6.9.1 General For all Class A, B-1, B-2, C-1, and C-2 HCF, air distribution systems shall be ducted from the air supply unit discharge to room terminal diffusers and return and exhaust systems shall be ducted from the point of air inlet of the occupied space to the point of recirculation or discharge to the outdoors.	6.9.1 General For all Class A, B-1, B-2, C-1, and C-2 HCF, air distribution systems shall be ducted from the air supply unit discharge to room terminal diffusers and return and exhaust systems shall be ducted from the point of air inlet of the occupied space to the point of recirculation or discharge to the outdoors. Distribution losses due to leak shall be less than 5%. **Note:** *1) HVAC energy costs can represent 50% of the the energy usage of a healthcare facility.* *2) Dust can be drawn into leaky duct systems through the Venturi Principle.*	

1	2	(3)	4	5	(6)	(7)
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Barry Hunt / Prescientx	0.5		te	**0.5 Principles and objectives**	Add: j) to prepare for and adapt to a new understanding of airborne transmission of disease and a new world of emerging and endemic diseases	
Barry Hunt / Humanity	0.5		te	**0.5 Principles and objectives**	Add: k) the Precautionary Principle shall guide all decisions throughout the planning and design process. Notes: *The Precautionary Principle in Canada is defined as follows:* *1) "Where there are threats of serious or irreversible [harm], lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent [the harm]"* *- Government of Canada, Canadian Environmental Protection Act* *https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/guide-to-understanding/chapter-3.html* *2) "A lack of scientific certainty must not be used to justify a delay in decision-making if there is a risk of serious or*	

1	2	(3)	4	5	(6)	(7)
MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					irreversible harm." *- Government of Canada, Public Health https://www.canada.ca/en/public-health/services/canadian-biosafety-standards-guidelines/guidance/pathogen-risk-assessment/document.html#a2.5* *3) "Where there is reasonable evidence of an impending threat to public harm, it is inappropriate to require proof of causation beyond a reasonable doubt before taking steps to avert the threat…that reasonable efforts to reduce risk need not await scientific proof."* *- Campbell Commission Report 2006*	
Barry Hunt / Humanity	1.1.3		te	**1.1.3 Inclusions**	Add: k) engineered infection prevention.	
Barry Hunt / Humanity	2		te	Z317.2:19 *Special requirements for heating, ventilation, and air-conditioning (HVAC) systems in health care facilities*	**Z317.2:24** *Special requirements for heating, ventilation, and air-conditioning (HVAC) systems in health care facilities* In light of what we have learned about airborne transmission of disease since the onset of the SARS-CoV-2 pandemic, we	

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					shouldn't be 5 years out of date upon publication of Z8000 in one of the most key elements of Engineered Infection Prevention, HVAC.	
Barry Hunt / Humanity	2		te	**2 Reference publications** This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below.	**2 Reference publications** This Standard refers to the following publications, and where such reference is made, it shall be to the latest edition or to the edition listed below. When reference standards are updated with text that improves patient outcomes, the latest edition should be used. In a worst case scenario, reference standards can be 5 years out of date at the time of publication of CSA Z8000. If, for example, the reference standard Z317.2 includes guidance that reduces HAIs by 10%, delaying reference to the latest 2024 edition of the Z317.2 standard could result in approximately 100,000 to 150,000 preventable infections nation-wide and approximately 7,000 to 22,500 preventable deaths across Canada in the intervening 5 years. But because there is no clause to upgrade the HCF once built, it could mean impacting the patients within the HCF for	

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					30 years or so thereby allowing 600,000 to 1 million ppl to be unnecessarily infected and allowing 42,000 to 135,000 preventable deaths.	
Barry Hunt / Humanity	3.1		te	**Airborne isolation room (AIR)** — a room that is designed, constructed, and ventilated to limit the spread of airborne micro-organisms from an infected occupant to the surrounding areas of the HCF. **Notes:** 1) *These rooms are designed for use when caring for patients requiring airborne precautions; for example, patients with known or suspected tuberculosis, primary or disseminated varicella-zoster virus infection, or measles.* 2) *AIRs are designed to maintain negative pressurization relative to adjacent areas.*	**Airborne isolation room (AIR)** — a room that is designed, constructed, and ventilated to limit the spread of rare or emerging or high-consequence airborne micro-organisms from an infected occupant to the surrounding areas of the HCF. **Notes:** 1) *These rooms are designed for use when caring for patients requiring airborne precautions; for example, patients with known or suspected Avian Flu or "Disease X" or Ebola.* 2) *AIRs are designed to maintain negative pressurization relative to adjacent areas.*	
Barry Hunt / Humanity	3		te	**Critical care area** — a patient care area where the induction and maintenance of general anaesthesia routinely occurs in connection with the examination or treatment of patients, or where cardiac contact between a patient and medical electrical equipment is frequent or normal.	**Critical care area** — a patient care area where patients require continuous monitoring and life-saving treatments. **Note:** *This definition is not adapted from that in the Canadian Electrical Code, Part I. :)*	

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				Note: *This definition is adapted from that in the Canadian Electrical Code, Part I.*		
Barry Hunt / Humanity	3		te	**Hand hygiene sink** — a sink that is designed for effective and efficient cleaning of the hands while restricting splashes and the spread of aerosols, and that is dedicated exclusively for the purposes of hand hygiene. **Notes:** 1) *The design of a hand hygiene sink includes the placement of soap and towel dispensers and garbage can.* 2) *A lavatory or other sink that is used for general purposes is not a dedicated hand hygiene sink.* 3) *See CSA Z317.1.*	**Hand hygiene sink** — a sink that is engineered for safe, effective and efficient cleaning of the hands while restricting splashes, preventing the growth of bacteria, mold and biofilm, and the spread of infectious bioaerosols, and that is intended primarily for the purposes of hand hygiene. **Notes:** 1) *The design of a hand hygiene sink includes the placement of soap and towel dispensers and garbage can.* 2) *A hand hygiene sink may also be used for general purposes.* 3) *See CSA Z317.1.*	
Barry Hunt / Humanity	3		te	**Mode of transmission** — the way in which infectious pathogens are transmitted from the reservoir to the host or susceptible patient (e.g., airborne, droplet, contact).	**Mode of transmission** — the way in which infectious pathogens are transmitted from the reservoir to the host or susceptible patient. Notes: 1) Modes of transmission include: airborne, blood borne, waterborne, food borne, vector borne, spray borne and surface borne (fomite) 2) Airborne includes dissemination	

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					through the air whereby infectious micro-organisms land in open wounds or on mucus membranes 3) "Droplet" is equivalent to spray borne and is only a significant risk of transmission where fluids such as blood or vomit may be ejected or splashed directly into open mouths or eyes. e.g. - trauma rooms 4) Contact is not a mode of transmission. 5) Recognition of the modes of transmission has evolved significantly since the onset of the SARS-CoV-2 pandemic. In particular, airborne transmission is now recognized to be much more widespread than previously espoused in the medical community.	
Barry Hunt / Humanity	3		te	**Personal protective equipment (PPE)** — specialized clothing or equipment designed to provide an additional layer of protection from potential exposure to environmental hazards, including infectious microorganisms.. **Note:** *Examples of PPE include masks, face shields, respirators, gowns, gloves, and eye protection.*	**Personal protective equipment (PPE)** — specialized clothing or equipment designed to provide an additional layer of protection from potential exposure to environmental hazards, including infectious microorganisms. **Note:** **1)** *Examples of PPE include face shields, respirators, gowns, gloves, and eye protection.*	

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					2) "Masks" are not considered PPE. "Surgical masks" and "procedure masks" provide a partial measure of source control but provide very little protection to the wearer against infectious aerosols. See CSAZ94.4-24, Selection, use and care of filtering respirators and CSAZ94.4.1-21, Performance requirements for filtering respirators	
Barry Hunt / Humanity	3		te	**Segregation room** – a single, enclosed room intended to separate patients with a suspected or confirmed infection or colonization. This room would typically be used for patients on additional precautions that do not require airborne precautions (see airborne isolation room).	**Segregation room** – a single, enclosed room intended to separate patients with a suspected or confirmed infection or colonization. This room would typically be used for patients on additional precautions that do not require airborne precautions for a rare or emerging pathogen or a pathogen of high consequence (see airborne isolation room).	
Barry Hunt / Humanity	3.2		ge	3.2 Abbreviations The following abbreviations shall apply in this Standard:	3.2 Abbreviations The following abbreviations shall apply in this Standard: EIP - Engineered Infection Prevention	

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Barry Hunt / Humanity	3.2		te	3.2 Abbreviations The following abbreviations shall apply in this Standard:	3.2 Abbreviations The following abbreviations shall apply in this Standard: HTAIR - High-threat pathogen airborne isolation room	
Barry Hunt / Humanity	4.1.1		te	**4.1.1 OASIS principles** d) infection prevention and control — creating an environment that promotes health prevention through HCF design to avoid hospital acquired infections and the prevention of infectious diseases and to ensure all occupants are safe;	**4.1.1 OASIS principles** d) infection prevention and control — creating an environment that is engineered to reduce or eliminate sources of pathogens, and to reduce exposure of occupants to pathogens to reduce or eliminate preventable environmental hospital acquired colonization, infection, morbidity and mortality;	
Barry Hunt / Humanity	4.2.1		te	4.2.1 Clinical functionality **Notes:** 1) *Operations considerations include* a) *an environment that supports appropriate care and treatment, anticipated outcomes and reflects the needs of individuals;* b) *clinical functionality to promote the effective delivery of care, including the application of technology equipment, and furniture to support the efficient operation of the HCF;*	4.2.1 Clinical functionality **Notes:** 1) *Operations considerations include* a) *an environment that supports appropriate care and treatment, anticipated outcomes and reflects the needs of individuals;* b) *clinical functionality to promote the effective delivery of care, including the application of technology equipment, and furniture to support the efficient*	

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				c) *support services to facilitate the creation and maintenance of the environment of care and clinical functionality; and* d) *infection prevention and control.*	*operation of the HCF;* c) *support services to facilitate the creation and maintenance of the environment of care and clinical functionality;* *d) exposure to air, water and surface sources of pathogens; and* e) *infection prevention and control.*	
Barry Hunt / Humanity	4.2.2.3		te	**4.2.2.3 Design of a safe and effective environment of care** k) provision for control over the environment by incorporating access to information, navigation, and environmental preferences through the use of technology for all; l) Inclusion of infection control and prevention practices to enhance the health and safety of patients, visitors, and staff; and m) Provision of natural light; exterior views and access to the outdoors, etc. **Note:** *Research and evidence-based information, when available, should be reviewed to support these objectives. Design should support the performance and productivity*	**4.2.2.3 Design of a safe and effective environment of care** k) provision for control over the environment by incorporating access to information, navigation, and environmental preferences through the use of technology for all; l) provision of materials and technologies to reduce exposure to pathogens from environmental sources including air, water, and surfaces to specified levels necessary to prevent transmission of disease. e.g. - <1 CFU/cm2 on surfaces and settle plates when tested randomly; m) Inclusion of infection control and prevention practices to enhance the health and safety of patients, visitors, and staff; and	

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				of the staff in order to promote a safe environment of care. The building and interior planning should be designed to create an efficient and high-quality patient environment, which is supportive of the delivery of services, patient well-being, comfort, and patient dignity. Furnishings, fittings, and finishes should be appropriate to the architecture and the functions being performed and items should be coordinated to fit and work with each other as needed.	n) Provision of natural light; exterior views and access to the outdoors, etc.	
Barry Hunt / Humanity	4.3.1.7		te	**4.3.1.7 Spaces and equipment** All spaces should be designed for accessibility. All equipment should allow for full use by patients, staff, physicians, volunteers and families. **Note:** *The design should take into account the need for possible variations in design features for accessibility, depending on the function of the space or department, or because of staff requirements in terms of assistance levels required by patients.*	**4.3.1.7 Spaces and equipment** All spaces should be designed for accessibility. All equipment should allow for full use by patients, staff, physicians, volunteers and families. This especially includes hand hygiene sinks and washroom sinks that provide access to occupants in wheelchairs. **Note:** *The design should take into account the need for possible variations in design features for accessibility, depending on the function of the space or department, or because of staff requirements in terms of assistance levels required by patients.*	
Barry Hunt	5.1.8.4.2		te	5.1.8.4.2 Interdisciplinary team	Add:	

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/ Humanity				The IDT shall be assembled as early as possible in the planning and design process, and be engaged based on the scope of the project. The IDT should be of a size and makeup that is appropriate to the scope, size, and complexity of the project. It should include subject matter experts and professionals as follows: a) Subject matter experts:	v) specialists in Engineered Infection Prevention including air, water, surfaces and drains	
Barry Hunt / Humanity	4.4.1		te	4.4.1 General The HCF shall be planned and designed to produce an environment of care that is safe and secure for all occupants (patients, families, staff, physicians, volunteers, and visitors). The planning and design of the HCF shall include provisions for achieving the following objectives related to the safety and security of patients, staff, physicians, volunteers and visitors to the HCF:	**Add:** c) safety from exposure to pathogens in air, water and on surfaces; d) safety from environmental conditions that increase susceptibility to pathogen exposure, colonization or infection (eg - dehydration); e) safety from environmental conditions that cause discomfort (e.g. - temperature, noise); g) safety from environmental conditions that cause dehydration (e.g. - low relative humidity); h) safety from internal environmental hazards (e.g., mould, chemicals, etc.); i) safety from external environmental hazards (e.g., air pollution, smoke, toxic discharges).	

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					j) protection from digital isolation (eg - poor or non-existent Wi-Fi, poor or non-existent cellular service) **Delete:** **Notes:** 1) *Infection prevention and control is a special subset of safety and is covered separately.* 2) *Consideration should be given to hazards from the external environment (e.g., air pollution, smoke, toxic discharges).*	
Barry Hunt / Prescientx	5.1.11.2		ge	**5.1.11.2 Content** The master program shall include the following information for each service in the HCF:	**5.1.11.2 Content** The master program shall include the following information for each service in the HCF: a) scope and extent of services provided by each component; b) historic activity/services/volumes/workload for each component for the past three years as applicable to the service including i) service volumes; ii) attendances; iii) visits; iv) tests;	

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					v) beds; and vi) new services. c) analysis of major impacts to healthcare for future 1) Covid pandemic 2) Long Covid • labour shortage • increase in chronic illness • increase in infectious disease transmission • increase in cancer • increase in cardiovascular events • increase in dementia 3. Climate Crisis	
Barry Hunt / Prescientx	5.1.13.3		te	**5.1.13.3 Stakeholder requirements** The HCF master plan shall plan the site to address the multi-facetted layers of stakeholder requirements including the following:	**5.1.13.3 Stakeholder requirements** The HCF master plan shall plan the site to address the multi-facetted layers of stakeholder requirements including the following: l) engineered infection prevention designed to reduce exposure of patients, staff and visitors to pathogens from air, water, surfaces & aerosolization.	
Barry Hunt	5.1.14.3		te	**5.1.14.3 Contents**	**5.1.14.3 Contents**	

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/ Prescientx				The functional program shall describe in detail:	The functional program shall describe in detail: r) engineered infection prevention designed to reduce exposure of patients, staff and visitors to pathogens from air, water, surfaces & aerosolization.	
Barry Hunt / Prescientx	5.1.14.4		te	**5.1.14.4 Additional considerations** The functional program shall be developed taking into account the following considerations as they apply to the HCF being designed:	**5.1.14.4 Additional considerations** The functional program shall be developed taking into account the following considerations as they apply to the HCF being designed: j) The impact of the Covid pandemic including Long Covid and immune disruption on HCW shortage, increase in patient loads due to Covid, cardiovascular, pulmonary, dementia, and other infectious diseases (eg - Flu, RSV, Colds, measles)	
Barry Hunt / Prescientx	5.1.15.2		te	**5.1.15.2 Structured program elements** The structured program should include the following elements:	**5.1.15.2 Structured program elements** The structured program should include the following elements: h) engineered infection prevention to reduce exposure of patients, staff and	

1	2	(3)	4	5	(6)	(7)
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					visitors to pathogens from air, water, surfaces and aerosolization.	
Barry Hunt / Humanity	5.1.16.1		te	**5.1.16.1 General** The HCF shall be designed and constructed to minimize energy consumption and emission of greenhouse gasses (GHG), caused by both the construction of the facility, and during its lifetime operation. **Note:**	**5.1.16.1 General** The HCF shall be designed and constructed to minimize energy consumption and emission of greenhouse gasses (GHG), caused by both the construction of the facility, and during its lifetime operation. **add:** Note: *Halogenated ethers and nitrous oxide used for inhalation anesthesia and conscious sedation and discharged through the Anesthetic Gas Scavenging System (AGSS) have high Global Warming Potentials (GWPs).*	
Barry Hunt / Humanity	5.1.16.3		te	**5.1.16.3 Performance targets**	Care shall be taken to prevent fugitive emissions of greenhouse gases, especially those well-known in healthcare, including anesthestic gases. **Note:** *Halogenated ethers and nitrous oxide used for inhalation anesthesia and conscious sedation and discharged through the Anesthetic Gas Scavenging System (AGSS) have high Global*	

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					Warming Potentials (GWPs). Systems to capture or destroy these gases to prevent release into the atmosphere should be considered.	
Barry Hunt / Humanity	5.1.18.3		te	**5.1.18.3 List of necessary FF&E**	**5.1.18.3 List of necessary FF&E** add: h) engineered infection prevention requirements	
Barry Hunt / Humanity	5.1.18.4		te	**5.1.18.4 Detailed stages of planning, design, procurement and installation**	**5.1.18.4 Detailed stages of planning, design, procurement and installation** **add:** k) engineered infection prevention designed to reduce exposure of patients, staff and visitors to pathogens from air, water, surfaces & aerosolization. (eg - self-sanitizing surface on OverBed Tables at least as effective as copper)	
Barry Hunt / Humanity	5.1.19		te	**5.1.19 Complementary plans**	**5.1.19 Complementary plans** add: j) engineered infection prevention plan.	
Barry Hunt	5.1.21.1		te	**5.1.21.1 General**	**5.1.21.1 General**	

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/ Humanity					add: i) include the latest engineered infection prevention materials and technologies designed to reduce exposure of patients, staff and visitors to pathogens from air, water, surfaces & aerosolization.	
Barry Hunt / Humanity	5.2.2		te	**5.2.2 Design development**	**5.2.2 Design development** add: j) engineered infection prevention materials and technologies designed to reduce exposure of patients, staff and visitors to pathogens from air, water, surfaces & aerosolization.	
Barry Hunt / Humanity	5.3.1.1		te	**5.3.1.1 Standards**	**5.3.1.1 Standards** add: l) CSAZ317.12 (Cleaning and disinfection of health care facilities)	
Barry Hunt / Humanity	7.1.4		te	**7.1.4 Design and construction**	**7.1.4 Design and construction** add: c) principles and practices of engineered infection prevention **Note:** e) effect of maintaining self-sanitizing surfaces and automated disinfection technologies in reducing risk of exposure	

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					to environmental pathogens to near zero (eg - copper, AutoUV and ROS water that reduce microbial loads to <1 CFU/cm2, continuously)	
Barry Hunt / Humanity	7.2.2.2		te	**7.2.2.2 Antimicrobial surfaces** Antimicrobial surfaces, if used, shall meet the surface characteristics listed in Clause 7.2.2.1.	**7.2.2.2 Self-sanitizing surfaces** Self-sanitizing surfaces shall be as effective as copper. Self-sanitizing surfaces shall be considered for all high-risk, high-touch and common touch points throughout the HCF. (eg - door handles, push plates, overbed tables, nursing station counters, BMT) Where used, self-sanitizing surfaces shall meet the surface characteristics listed in Clause 7.2.2.1. Note: *1)* Copper alloys and copper ion infused solid surfaces are considered to be as effective as copper. *2) The minimum efficacy of a self-sanitizing surface shall be a 99.9% reduction in bacteria < 2 hours* *3) Copper surfaces typically maintain a bioburden of <1 CFU/cm2.* *4) The efficacy of the self-sanitizing surface selected shall not wane over time*	

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Barry Hunt / Humanity	7.2.2.4		te	**7.2.2.4 Floors**	**7.2.2.4 Floors** add: Floors play an integral role in the transmission of disease by collecting bacteria, viruses, mold and dust and allowing re-aerosolization with foot traffic, door swings and normal HCF activity. The re-aerosoliized particles may be inhaled, ingested, fall into open wounds during care, or settle on surfaces close to the patient such as overbed tables. The significant role of the floor in disease transmission shall be considered when selecting the floor material.	
Barry Hunt / Humanity	7.3.3		te	**7.3.3 Functional requirements** FF&E shall be consistent with the functional requirements of the area, including a) type of patient, visitor, staff; b) anticipated wear and tear; c) hours of use; d) chemicals in use at the site that could impact finishes/fabrics of the furniture;	**7.3.3 Functional requirements** FF&E shall be consistent with the functional requirements of the area, including e) UVC (UV254) and FarUV (UV222) in use at the site that could impact finishes/fabrics of the furniture;	
Barry Hunt / Humanity	7.3.6		te	**7.3.6 FF&E decision-making criteria**	**7.3.6 FF&E decision-making criteria**	

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				Throughout the selection process, criteria for decision-making regarding FF&E shall include	Throughout the selection process, criteria for decision-making regarding FF&E shall include: h) the ability to maintain a continuous surface bioburden of <1 CFU/cm2 or other target designated by the IDT;	
Barry Hunt / Humanity	7.3.7		te	**7.3.7 Furniture and equipment criteria**	**7.3.7 Furniture and equipment criteria** **Note:** *Self-sanitizing surfaces should be cleaned with environmentally-friendly, non-toxic, neutral cleaners only.*	
Barry Hunt / Humanity	7.4.6		te	**7.4.6 Program Areas** Unless specified under individual program areas, technology planning for all program areas shall address the digital health vision and strategy and typically include the following:	**7.4.6 Program Areas** Unless specified under individual program areas, technology planning for all program areas shall address the digital health vision and strategy and typically include the following: add: w) high speed Wi-Fi for use by patients and visitors throughout the HCF	
Barry Hunt / Humanity	7.5.1.2		te	**7.5.1.2**	**7.5.1.2** add:	

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					Note: *1) Since the Covid pandemic started, we've learned that SARS-CoV-2 is airborne, that 50% or more of infected people are asymptomatic, that hallway concentrations of SARS-CoV-2 in air are higher than in patient rooms, and trying to isolate or cohort patients in large numbers is impractical. Thus, relying on AIIRs as a strategy for a pandemic disease like Covid is not a solution. More and more airborne diseases are emerging, due in large part to immune disruption due to Covid infection, as well as vaccine hesitancy, climate crisis, population growth and international travel. All patient rooms should be optimized to protect occupants from airborne transmission of disease.*	
Barry Hunt / Humanity	7.5.1.3		te	**7.5.1.3** Planning shall make provisions to facilitate	**7.5.1.3** Planning shall make provisions to facilitate: add: j) engineered infection prevention materials and technologies designed to reduce exposure of patients, staff and visitors to pathogens from air, water, surfaces & aerosolization	

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Barry Hunt / Humanity	7.5.1.5		te	**7.5.1.5** The HCF design shall be consistent with best practice for infection prevention and control, including	**7.5.1.5** The HCF design shall be consistent with best practice for infection prevention and control, including a) promotion and facilitation of the use of routine infection prevention and control practices, including convenient access to PPE; **Note:** *PPE is used both in the delivery of care and in support services that don't involve patient contact, such as MDR, environmental services, and food services.* b) placement of hand hygiene sinks (HHS) **Note:** *Hand hygiene sinks should be engineered to mitigate the release of pathogenic bioaerosols.* c) placement of waterless hand hygiene stations; **Note:** waterless hand hygiene stations *should be engineered to prevent transmission of pathogens by touch (eg - touch-free)* f) the use of cleanable materials and self-sanitizing surfaces for furnishings, fittings, and finishes;	

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					Notes: *3) See CSAZ317.12 Cleaning and disinfection of healthcare facilities for information on emerging technologies*	
Barry Hunt / Humanity	7.5.2.7.2		te	**7.5.2.7.2 Non-infectious patients**	**7.5.2.7.2 Non-infectious patients** Patients should be considered infectious until or unless tested to prove otherwise. The distance between chairs shall be 2000 mm. **Note:** *1) 50% or more of people with Covid infections are asymptomatic. The exposure to exhaled airborne pathogens varies with the square of the distance within close range. Thus, the exposure may be an order of magnitude greater with close proximity. A prudent course of action is to allow 2000 mm between all chairs in the absence of evidence of non-infection.*	
Barry Hunt / Humanity	7.5.5.1		te	**7.5.5.1**	**7.5.5.1** **Note:** *2) AIIRs are appropriate for rare or emerging highly infectious RG3 or RG4*	

1	2	(3)	4	5	(6)	(7)
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					diseases to prevent spread of disease throughout the HCF and into the community. AIIRs are not appropriate for diseases already at endemic or pandemic levels with high rates of HCF or community cases.	
Barry Hunt / Humanity	7.5.5.4		te	**7.5.5.4**	**7.5.5.4** If the functional programming process indicates that additional AIRs could be needed, a needs assessment capacity study shall be completed. During development of the functional program, planners shall consult with the HCF's infection prevention and control program and subject matter experts in engineered infection prevention to determine the number of AIRs needed on each unit. **Notes:** 1) *In general, more than one AIR will be needed in medical-surgical, medical, pediatric, or critical-care areas. During development of the functional program, planners should consult with the HCF's infection prevention and control program and subject matter experts in engineered infection prevention to determine the number of AIRs needed throughout the*	

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					facility.	
Barry Hunt / Humanity	7.5.5.9		te	**7.5.5.9** A three-piece washroom directly accessible from the bed space shall be included in all inpatient AIRs. A two-piece washroom shall be provided for emergency care. Consideration should be given to including a two-piece washroom for AIRs in ambulatory care settings. **Note:** *The decision on washroom configuration will depend on the services provided and the ICRA.*	**7.5.5.9** A three-piece washroom directly accessible from the bed space shall be included in all inpatient AIRs. A two-piece washroom shall be provided for emergency care. Consideration should be given to including a two-piece washroom for AIRs in ambulatory care settings. Engineered infection prevention measures shall be deployed to prevent bacterial growth and biofilm formation in sink ad shower drains, and to reduce aerosolization and contamination in air and on surfaces of pathogens from sinks, showers, drains and toilets, **Note:** **1)** *The decision on washroom configuration will depend on the services provided and the ICRA.* *2) Self-sanitizing sinks, self-sanitizing solid surfaces, and AutoUV are some engineered infection prevention measures that could be considered.*	
Barry Hunt / Humanity	7.5.5.6.1		te	**7.5.5.6.1 Class A and B HCF AIRs**	**7.5.5.6.1 Class A and B HCF AIRs** add:	

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					Each AIR shall include means to rapidly disinfect the room at least daily. **Note:** *1) Rapid room disinfection may be accomplished with UVC or FarUV.*	
Barry Hunt / Humanity	7.5.5.11		te	**7.5.5.11 High-threat pathogen airborne isolation room** High-threat pathogen airborne isolation rooms shall have negative pressure isolation with additional protection for accommodating highly infectious patients with pathogens such as haemorrhagic fever and pneumonic plague. Additional design elements should include separate entry and exit anterooms, 3-piece ensuite washroom, soiled utility and staff change room.	**7.5.5.11 High-threat pathogen airborne isolation room** High-threat pathogen airborne isolation rooms shall have negative pressure isolation with additional protection for accommodating highly infectious patients with pathogens such as haemorrhagic fever and pneumonic plague. Additional design elements should include separate entry and exit anterooms, 3-piece ensuite washroom, soiled utility and staff change room, and engineered infection prevention measures including self-sanitizing surfaces, self-sanitizing sinks, and AutoUV. .	
Barry Hunt / Humanity	7.5.12.1.1		te	**7.5.12.1.1**	**7.5.12.1.1** The location and design of hand hygiene facilities shall be developed in consultation with infection prevention and control personnel and subject matter experts in engineered infection prevention	

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					and shall be consistent with the ICRA. The HCF design shall specify a) the room location of hand hygiene sinks in the HCF, and the placement of the sink(s) within each room location and in relation to counters and other related fixtures; b) hand hygiene sink design; and c) the location of waterless hand hygiene stations Hand hygiene sinks shall be engineered to prevent the growth of bacteria, mold and biofilm in drains and to prevent the release of pathogenic bioaerosols.	
Barry Hunt / Humanity	7.5.12.1.2		te	Sinks are routinely used for disposal despite policies prohibiting disposal & education measures about disposal. One study showed 96% of sink use in HC was for disposal. We must recognize that compliance with this is minimal and likely always will be. The danger of aerosolization of pathogens in sink drains exists whether or not fluids are disposed of in the sink so we should plan to mitigate harm from aerosolization regardless.	Hand hygiene sinks shall be engineered to prevent the growth of bacteria, mold and biofilm in drains and to prevent the release of pathogenic bioaerosols.	

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Barry Hunt / Humanity	7.5.12.1.3		te	Sinks are routinely used for disposal despite policies prohibiting disposal & education measures about disposal. One study showed 96% of sink use in HC was for disposal. We must recognize that compliance with this is minimal and likely always will be. The danger of aerosolization of pathogens in sink drains exists whether or not fluids are disposed of in the sink so we should plan to mitigate harm from aerosolization regardless.	Sinks used for cleaning of equipment and the disposal of waste fluids (e.g., IV fluids, lipids, used antiseptics) shall be engineered to prevent the growth of bacteria, mold and biofilm in drains and to prevent the release of pathogenic bioaerosols	
Barry Hunt / Humanity	7.5.12.2.1		te	Aerosolization of pathogens from dispensed water and drain traps is a leading cause of HAIs. We should not dispense raw water in HCFs. We should not allow growth of bacteria, mold and biofilm in sink drains.	**7.5.12.2.1** A hand hygiene sink shall be installed in each of the following locations: a) In Class A HCFs, inside each inpatient bedroom, adjacent to the entrance unless an ICRA demonstrates an alternative location is preferred to support staff workflow while maintaining IPAC best practice for hand hygiene and PPE donning and doffing process.; b) in any space where physical treatment is provided or procedures or physical exams are performed, as follows: i) one sink in a location designed for one patient to be present at a time [e.g., one	

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					sink to one patient (1:1)]; or ii) one sink in a location designed to accommodate two or more patients at a time [e.g., one sink to two patients (1:2) or one sink to four patients (1:4)] while maintaining unobstructed access and with no more than 6 m distance between any patient station and the nearest sink; **Note:** *A ratio of one sink for every four patients should be used unless an ICRA conducted by the IDT (with input from the Infection Prevention and Control Professional) can demonstrate fewer sinks are appropriate. The risk assessment should take into account the functional layout of the space, presence of physical barriers such as doors, total number of staff working in the space, staff/patient flow, total number of patients cared for in the space, and need for redundancy.* ii) An ICRA shall be conducted to determine whether a hand hygiene sink inside an individual procedure room or a scrub sink outside the procedure room or both is the most appropriate configuration taking into consideration the invasiveness of the procedures performed, type of anesthesia or sedation used, staff flow,	

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					risk of water contamination and door access. If scrub sinks are programmed outside of the room, door entry into the room shall have hands free activation to ensure the door does not act as a barrier to sink access or a source of recontamination. If hand hygiene sinks are programmed within the room, the ICRA shall inform appropriate placement to prevent risks associated with exposure to water sources. Water sources are not recommended in invasive procedure rooms. ***Note:*** *There are certain types of invasive procedures (e.g., interventional radiology) where water sources within the room may act as a risk for infection. These sinks should always include engineered infection prevention measures to reduce the risk of infection. (eg - point of use ROS generation can disinfect both the dispensed water and the drains)* c) inside or adjacent to each medical diagnostic imaging room where magnetic interference is a concern; **Note:** *For medical diagnostic imaging rooms in which magnetic interference is a concern (e.g., MRI rooms), the hand hygiene sink may be either*	

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					a) *immediately outside the room; or* b) *located in the room if plastic pipes are used through the radio frequency cage, with the trap outside the wall cavity.* d) in each soiled utility (in addition to utility sinks or waste disposal systems that are used for contaminated material); e) in any room in which food or infant formula/breastmilk is handled or prepared; **Note:** *Staff respite areas (e.g., staff lounges) or spaces where packaged food items are handled (e.g., no handling or preparation of open food items for consumption by patients/clients) do not require an HHS.* f) in any room where patient care items (e.g., procedure tray) are prepared; g) inside each nursing station or within 6 m of the station; h) within 6 m of each laboratory workstation and within each lab work room; i) in each room in which medication is prepared (including in pharmacies); *Note: The requirement for hand hygiene sinks in medication rooms utilizing automated dispensing units where no*	

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					preparation or mixing is required should be based on a risk assessment taking into consideration any occupational health and safety concerns and the location of the closest available hand hygiene sink. j) in each area where unbagged soiled linen is handled; k) other areas where hands are likely to be contaminated, such as in goods receiving areas, chemical storage, and waste storage and disposal areas; and l) in airborne isolation rooms, as follows: i) one hand hygiene sink in the anteroom; and ii) one in the room itself. m) entrances and exits to MDR as identified by the ICRA taking into consideration presence of vestibules, staff flow, and location and process of PPE donning and doffing. **Note:** *The hand hygiene sinks specified in this Clause are distinct from, and required in addition to, sinks installed in patient washrooms. The requirement for two hand hygiene sinks relates to PPE donning and doffing and future planning for emerging infectious diseases.*	

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Barry Hunt / Humanity	7.5.12.2.3		te	Aerosolization of pathogens from dispensed water and drain traps is a leading cause of HAIs. We should not dispense raw water in HCFs. We should not allow growth of bacteria, mold and biofilm in sink drains.	**7.5.12.2.3** Engineered Infection Prevention measures shall be taken to prevent the propagation and transmission of infectious micro-organisms from sink drains. (eg - self-sanitizing sinks that dispense ROS water and prevent growth of bacteria, mold and biofilm in sink drains)	
Barry Hunt / Humanity	7.5.12.3		te	Waterless hand hygiene stations are a common touch point well-known to carry pathogens, including many that are resistant to alcohol.	Add: 7.5.12.3.5 Waterless hand hygiene stations shall be touchless or otherwise engineered to prevent touch transmission of disease	
Barry Hunt / Humanity	7.5.13		te	Aerosolization of pathogens from dispensed water and drain traps is a leading cause of HAIs. We should not dispense raw water in HCFs. We should not allow growth of bacteria, mold and biofilm in sink drains. This is especially important for Scrub Sinks where we are trying to achieve sterility	**7.5.13 Scrub sinks** A scrub sink (as distinct from a hand hygiene sink) shall be provided in any area where invasive procedures are performed including, but not limited to ORs, operative birthing rooms, interventional radiology, cardiac catheterization suites, cystoscopy and gynecology procedure rooms, burn treatment rooms, trauma rooms and pharmacy sterile compounding anterooms. Scrub sinks shall be self-sanitizing and shall include engineered infection	

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					prevention measures to reduce growth of bacteria, mold and biofilm in drains, and aerosolization of pathogens. (eg - scrub sinks that dispense ROS water provide additional disinfection to hands, and reduce or eliminate airborne pathogens from faucets and drains)	
Barry Hunt / Humanity	7.7.4.1		te	In the hierarchy of controls to mitigate hazards, engineering controls take priority over administrative control. They are both more effective and more consistent. They are also less expensive, labour-saving and provide a significant cost-benefit.	**7.7.4.1** The HCF shall be designed to minimize physical hazards to staff, patients, and visitors. This shall include a) the use of materials with intrinsic safety characteristics (e.g., slip-resistant flooring); and b) automatic shut-off for equipment and devices where appropriate (e.g., power, gases). c) self-sanitizing high-touch surfaces (eg - copper alloys door hardware, copper ion infused solid surface nursing stations and overbed tables) d) point-of-use disinfection water dispensers (eg - sinks that dispense ROS treated water) e) self-sanitizing washrooms (eg - AutoUV)	

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Barry Hunt / Humanity	Annex E (informative)		ed	typo	*8) This informative Annex has been written uses mandatory language in certain clauses to facilitate adoption by anyone wishing to do so.*	
Barry Hunt / Humanity	E.2.1		te	It's important to standardize on only one set of units to be used for UV, especially when ppl are not familiar with the technology, to avoid design mistakes that are an order of magnitude in scale. The standard units determined by the HealthCare Technology Task Force of the International UV Association (IUVA) are: Irradiance: mW/cm2 Dose: mJ/cm2 Note: Dosage = total dose per day	**E.2.1 UVC wavelength, irradiance (fluence rate), dose (fluence), and efficiency** Several wavelengths exhibit antimicrobial properties but the currently acceptable wavelengths, based on safety, efficacy, cost, longevity and form factor, are UV_{254} fluorescent, and UV_{265} to UV_{275} LED. UV_{254} fluorescent lamps typically vary in wall-plug efficiency from 15% to 35% and are generally available in input power values from 3 watts (W) to 200 W and output power values from 500 milliwatts (mW) to 70,000 mW. UV_{222} excimer lamps are generally available in input power values up to 30 W and output power values measured from 5 milliwatts (mW) to 30 mW. UV_{265} to UV_{275} LEDs typically vary in wall-plug efficiency from 1% to 7% and are generally available in output power values measured from 5 milliwatts	

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					(mW) to 200 mW. The terms irradiance and fluence rate, and dose and fluence are often used interchangeably. For the purposes of this standard the term irradiance (units mW/cm^2) will be used to denote the flux of radiant energy per unit area. Irradiance increases linearly with higher power, decreases with the inverse square of the distance, and decreases with the cosine of the angle of incidence. For example, a lamp that delivers twice the output power will deliver twice the irradiance. A lamp that is twice as far from a target will deliver $1/2^2$ = ¼ the irradiance. A lamp that is at 45 degrees to the target will deliver cos45 ~ 70% of the irradiance. The term dose (units mJ/cm^2) will be used to denote the amount of germicidal light that is absorbed by a particle at one time and is a product of irradiance and exposure time in seconds. The dosage is a product of irradiance and exposure time. The effectiveness of UV disinfection is heavily influenced by the appropriate dosage strategy. A range of dosages are required for inactivation of different microorganisms and even different species or strains of the same genera.	

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					Most organisms have a known "*k*" value for UV_{254} that states the dosage required for each 90% reduction of an organism in air, water or on surfaces. Different organisms also have differing abilities to repair DNA damage caused by UV light (a process termed photoreactivation). The medium (air, water, surface), UVC irradiance, time, frequency and susceptibility determine the overall germicidal efficacy for each organism. UVC disinfection systems should be optimized to ensure efficacy for epidemiologically important pathogens of concern. In general, systems should be designed to provide 'overkill', a significantly higher dosage than the minimum required to achieve the desired log reduction of the organism most resistant to UVC.	
Barry Hunt / Humanity	E.2.2		te	A lot of work has been done on determining the safety and efficacy of FarUV recently, such that systems can now be engineered for use in HCFs.	E.2.2 Types of UVC lamps Historically the most common type of lamp used to produce UVC is the low-pressure mercury lamp. Generally emitting at 254 nm, these lamps have lower cost (per mW) compared to newer lamp options, high output (10 to 100	

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					mW/cm^2), and an exposure limit of 6 mJ/cm^2. There are also pulsed Xenon UV lamps available that emit a broad range of UV wavelengths. These lamps emit a short pulse of broad-spectrum light that can be filtered to emit mainly UVC radiation. They are typically used in unoccupied spaces, but not commonly as fixed building devices. The UV_{222} excimer lamp or Far-UVC lamp is new to the healthcare industry and more expensive (per mW) relative to the traditional low-pressure mercury lamp. They have low output (0.01 to 0.03 mW/cm^2) and an exposure limit of 169 mJ/cm^2 for eyes, and 460 mJ/cm^2 for skin. The UV_{265} to UV_{275} light-emitting diodes (LED) are another option, more expensive (per mW) than traditional lamps with low output (0.01 to 0.2 mW/cm^2 per LED, multiple LEDs per array) and an exposure limit 6 mJ/cm^2. The small surface area and higher directionality may make them less effective for germicidal applications. In general, UV_{254} lamps are used for both built-in and mobile room size	

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					applications for rooms when the rooms are unoccupied. Pulsed UVC lamps are generally used for mobile room size applications for rooms when the rooms are unoccupied. Care should be taken not to expose people who are sensitive to strobe lights. UV_{265} to UV_{275} LEDs are generally used for close-range applications in unoccupied spaces. There should be careful evaluation of lamp type for the specific intended application taking into consideration optimal design, safety, maintenance, and bulb replacement implications.	
Barry Hunt / Humanity	E.5.2		te	A lot of work has been done on determining the safety and efficacy of FarUV recently, such that systems can now be engineered for use in HCFs.	E.5.2 FarUV222 decontamination systems FARUV222 has a much wider safety profile than UV254 and as such offers the opportunity to disinfect occupied spaces. One application that could be significant for HCFs is elevators as the occupancy is short so the intensity can be higher than a room occupied 24/7. FARUV222 has the potential to be used in waiting rooms and patient rooms, however, the intensity must be low enough to prevent exceeding a dose of	

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					169 mJ/cm2 per day at eye level. Even so, there is an application of ceiling mounted fixtures that could provide a significant reduction in air and surface contamination.	
Barry Hunt / Humanity	8.1.2.5		te	As a patient, having to learn a new device to control your environment can be difficult. An app or portal accessed by the patients own Android or Apple device can alleviate both the learning curve and the obsolescence factor. Voice-activated AI will likely also be a good option for future. Patients do not appreciate having to use a HCF supplied device to "*control entertainment, and connectivity to outside world". Show patients respect. Give them high-speed Wi-Fi and the ability to log into their own Netflix, AppleTV, Prime, etc. accounts & cast to a large screen TV. Also, if supplying a device for environmental controls, it should not be a monitor at the end of an articulating arm. They are awkward, expensive, obsolete and are common touch surfaces that are rarely disinfected. the "device" should be as portable as an iPad.*	8.1.2.5 Control of environment Patients should have the capability to control their environment, including lighting, window shades, temperature. **Note:** *This can be achieved through a patient environment controller. A patient environmental controller could be a personal electronic device (e.g., iPad, iPhone, Android phone) or voice-activated AI.*	

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Barry Hunt / Humanity	4.5.1.2		te	Infection control practitioners have expertise in the way infection control is practiced within their current environment. They are not subject matter experts in engineered infection prevention, the engineered reduction of exposure to pathogens from air, water, surfaces and aerosolization, so it's necessary to consult with people who are.	The planning and design process shall include participation by representatives of the stakeholders that are involved and shall include: 1) subject matter experts in engineered infection prevention of air, water and surfaces to reduce exposure to pathogens in healthcare facilities; 2) infection control practitioners. **Note:** *Subject matter experts in engineered infection prevention and infection control practitioners are two distinct groups.*	
Barry Hunt / Humanity	4.5.1.3		te	Construction & operation are two different things. We need two different clauses. Patients in HCFs can be 100X more susceptible to disease transmission, severity and death than the general population. This is a very important issue that should be addressed in the Standard. For example, the mortality rate of Covid is ~ 0.1%. The mortality rate of a Covid HAI may be as high as 10% to 15%.	**4.5.1.3.1 Infection control risk assessment for construction** An infection control risk assessment (ICRA) for construction shall be conducted as part of the planning process for any new construction, addition, or renovation of a HCF. The HCF shall be designed and constructed to reduce or eliminate exposure to pathogens from air, water and surfaces, including but not limited to, environment-to-person and person-to-	

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					person transmission of disease in the health care setting, during construction. 1) *CAN/CSA-Z317.13 provides requirements, guidance, and a sample form for an ICRA associated with construction and renovation projects during construction.* **4.5.1.3.2 Infection control risk assessment for operation** An infection control risk assessment (ICRA) for post-construction occupancy and operation shall be conducted as part of the planning process for any new construction, addition, or renovation of a HCF. The HCF shall be designed and constructed to reduce or eliminate exposure to pathogens from air, water and surfaces, including but not limited to, environment-to-person and person-to-person transmission of disease in the health care setting, as outlined in the post-construction ICRA. The post-construction occupancy and operation ICRA shall be developed by an IDT that includes subject matter experts in engineered infection prevention, patient advocates, infection	

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					control practitioners, environmental services and facility managers. Every precaution shall be taken to prevent the transmission of illness from patient to patient, from the health care provider to the patient, from patient to the health care provider, and from the building to its occupants. **Notes:** 1) *The health status of occupants in a HCF is not always known. For example, about half of visitors and staff who have Covid are asymptomatic. So are many patients.* *2) Patients in healthcare facilities are much more susceptible to morbidity and mortality from disease than the general population. For example, the risk of dying from Covid can be 100 times higher than the general population.*	
Barry Hunt / Humanity	4.5.1.2		te	**4.5.1.2 Representatives of major stakeholders** The planning and design process shall include participation by representatives of the stakeholders that are involved and have expertise in infection prevention and control issues and practices.	The planning and design process shall include participation by representatives of the stakeholders that are involved and shall include: 1) subject matter experts in engineered infection prevention of air, water and surfaces to reduce exposure to pathogens	

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				Note: *See Clause 5.1.8.4*	in healthcare facilities; 2) infection control practitioners. **Note:** *Subject matter experts in engineered infection prevention and infection control practitioners are two distinct groups.*	
Barry Hunt / Humanity	4.5.1.3		te	4.5.1.3 Infection control risk assessment An infection control risk assessment (ICRA) shall be conducted as part of the planning process for any new construction, addition, or renovation of a HCF. The HCF shall be designed and constructed to minimize the potential for acquisition and transmission of infections in the health care setting, as outlined in the ICRA. **Notes:** 1) *CAN/CSA-Z317.13 provides requirements, guidance, and a sample form for an ICRA associated with construction and renovation projects.* 2) *The health status of occupants in a HCF is not always known and every precaution should be taken to prevent the transmission of illness from patient to patient, from patient to the health care provider, and from the building to its occupants.*	**4.5.1.3.1 Infection control risk assessment for construction** An infection control risk assessment (ICRA) for construction shall be conducted as part of the planning process for any new construction, addition, or renovation of a HCF. The HCF shall be designed and constructed to reduce or eliminate exposure to pathogens from air, water and surfaces, including but not limited to, environment-to-person and person-to-person transmission of disease in the health care setting, during construction. 1) *CAN/CSA-Z317.13 provides requirements, guidance, and a sample form for an ICRA associated with construction and renovation projects during construction.* **4.5.1.3.2 Infection control risk**	

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					assessment for operation An infection control risk assessment (ICRA) for post-construction occupancy and operation shall be conducted as part of the planning process for any new construction, addition, or renovation of a HCF. The HCF shall be designed and constructed to reduce or eliminate exposure to pathogens from air, water and surfaces, including but not limited to, environment-to-person and person-to-person transmission of disease in the health care setting, as outlined in the post-construction ICRA. The post-construction occupancy and operation ICRA shall be developed by an IDT that includes subject matter experts in engineered infection prevention, patient advocates, infection control practitioners, environmental services and facility managers. Every precaution shall be taken to prevent the transmission of illness from patient to patient, from the health care provider to the patient, from patient to the health care provider, and from the building to its occupants. **Notes:**	

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					1) *The health status of occupants in a HCF is not always known. For example, about half of visitors and staff who have Covid are asymptomatic. So are many patients.* *2) Patients in healthcare facilities are much more susceptible to morbidity and mortality from disease than the general population. For example, the risk of dying from Covid can be 100 times higher than the general population.*	
Barry Hunt / Humanity	4.5.1.4		te	**4.5.1.4 Infection prevention and control measures** The following infection prevention and control measures shall be incorporated into the design and construction of the HCF:	Add: d) using finish materials on high-touch surfaces, including materials on FF&E, that are at least as self-sanitizing as copper, alloys of copper, or solid surfaces infused with copper ions, and able to withstand regular use and repeated cleaning (eg - door handles, countertops, and overbed tables); e) provision of touchless devices where possible (eg - door actuators, light switches); f) provision of hand hygiene sinks engineered to prevent growth of bacteria, mold, yeasts and biofilm in faucets and drains, and are conveniently located to encourage use by health care workers;	

1	2	(3)	4	5	(6)	(7)
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					g) provision of waterless touch-free hand hygiene stations that are well-designed to minimize transmission of pathogens, and are conveniently located to encourage use by health care workers; h) provision of automated UVC room disinfection in bathrooms that do not require operator input i) Inclusion of additional automated engineered infection prevention technologies as determined by the IDT (eg - push-button UVC disinfection of patient rooms, automated UVC in utility rooms and equipment rooms, Far UV in elevators) j) provision of single-place bathrooms only for the public **Notes:** *1) See CAN/CSA-Z317.13, and the FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities.* *2) See CAN/CSA-Z317.12, Cleaning and disinfection of health care facilities* 3) *Planning processes for infection prevention and control should include consideration of new and emerging technologies, and the design aspects that could be needed to accommodate these technologies.*	

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					3) In Canada, Health Canada Pesticide Management Regulatory Agency (PMRA) registers UV devices.	
Barry Hunt / Humanity	4.5.2		te	**4.5.2 Objectives** The design and construction of the HCF shall support the following infection prevention and control objectives:	**4.5.2 Objectives** The design and construction of the HCF shall support the following infection prevention and control objectives: a) continuously reduce exposure to airborne, water-borne or surface-borne pathogens to a target level established by the IDT (eg - Surfaces <1 CFU/cm2, 24/7) b) reduce the aerosolization of environmental pathogens found in toilets, faucets, sink and shower drains to a target level established by the IDT; c) reduce the re-aerosolization of environmental pathogens found on hard and soft surfaces including bathroom fixtures, countertops, floors, curtains, and FFE (eg - overbed tables) to a target level established by the IDT d) facilitate the use of routine infection prevention and control practices for all patients, regardless of the diagnosis and tailored to the patient and the risk, including i) placement of hand hygiene sinks	

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					ii) placement of waterless hand hygiene stations; iii) placement of personal protective equipment used in delivery of care (e.g.- respirators, gloves and gowns); and, iv) placement of non-patient health-care-related functions (eg - decontamination of reusable medical devices); e) provide sufficient space, number of rooms, and engineered infection prevention measures to allow the safe placement of patients based on mode of transmission of infectious organisms, transmissibility, virulence, susceptibility of the existing patient population, and identifiable risks; **Note:** *For Class A and B HCFs, this includes the capability to establish and maintain separate zones for patients in outbreaks, epidemics, and pandemics.* f) Incorporate the patient and staff/physician flow, so that the arrangement of rooms and corridors minimizes the spread of infection through patient movement/transfer; g) facilitate the management of potentially infectious materials, including	

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					soiled medical devices, human waste and body fluids, and medical waste; and h) facilitate safe effective cleaning, disinfection, and sterilization of reusable medical devices, shared electronic devices, and high-touch surfaces (items that are susceptible to cross-contamination) and, where warranted, disinfection of the HCF. **Note:** *The objectives identified in Items a) to h) will reduce the potential for transmission of organisms. See CAN/CSA-Z314 and CAN/CSA-Z317.12.*	
Barry Hunt / Humanity	4.5.3.1		te	**4.5.3.1 General**	**4.5.3.1 General** All inpatient bedrooms in Class A HCFs shall be single bedded rooms, with private 2-piece/3-piece washroom, unless the functional program demonstrates the necessity of a two-bed arrangement. The design of single-bed inpatient bedrooms shall include the rooming-in of family members and caregivers. Justification for two-bedded inpatient bedroom accommodation shall include supporting documentation validating the clinical significance of this arrangement. In this arrangement there shall be one	

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MB	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph / Figure/Table/Note** (e.g. Table 1)	**Type of com-ment**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
					washroom per patient. **Note:** *Single-patient room occupancy has been shown to reduce healthcare acquired infections (HAIs). Medication errors are also reduced. Privacy is enhanced. Noise is reduced. Calm is facilitated. Caregiver access, accommodation and participation is increased. Visitation is facilitated. Flexibility in patient placement is enabled. Safety is improved for both patients and health care providers overall.* *Facilities are continually challenged in having to close rooms and/or units due to patient exposure to infectious organisms. Many outbreaks start from a roommate exposure or shared washroom facilities. Patient placement is hampered, and waiting times in emergency rooms increased, as a result of lack of appropriate rooms to place patients.*	
Barry Hunt / Humanity	4.5.3.3		te	**4.5.3.3 ICU/NICU patient washroom**	**4.5.3.3 ICU/NICU patient washroom** The patient washroom may be omitted in an ICU/NICU inpatient room. **Note:** *In pediatric facilities, the ability*	

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					for parents to stay in the room is important. In this situation, washrooms for use by family members should be protected with engineered infection prevention measures including automated UVC disinfection and self-sanitizing sinks and drains or separate family washrooms and showers should be provided elsewhere in the inpatient unit, for use by parents.	
Barry Hunt / Humanity	4.5.3.4		te	**4.5.3.4 Single inpatient bedrooms in other facility classes**	**4.5.3.4 Single inpatient bedrooms in other facility classes** The use of single inpatient bedrooms in other facility classes should be in accordance with the HCF's functional program. In an inpatient bedroom with more than one bed, there shall be either: 1) a shared washroom with engineered infection prevention measures including automated UVC disinfection, self-sanitizing sinks and drains, and self-sanitizing high touch surfaces (eg - countertops and toilet seats); or, 2) one washroom per patient bed.	
Barry Hunt / Humanity	4.5.3.5		te	**4.5.3.5 Access to PPE**	**4.5.3.5 Access to PPE** All inpatient bedrooms, exam rooms, and	

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					procedure rooms shall have convenient access to PPE. PPE shall be located outside each room where patient care occurs in a dedicated storage cabinet/dispenser. The storage cabinet/dispenser may be shared between rooms/treatment stations taking into consideration the scope of care provided, types of PPE required and anticipated PPE volumes needed. Add: **Note:** *The SARS-CoV-2 / Covid pandemic has highlighted the need for routine airborne protection in every patient room including the provision of CA-N95 respirators in dispensers outside each room.*	
Barry Hunt / Humanity	4.5.6		te	**4.5.6 Supplemental disinfection systems or technologies**	**4.5.6 Automated disinfection systems or technologies** Note to TC: Automated disinfection technologies such as automated UVC disinfection in bathrooms, copper self-sanitizing high touch surfaces, and self-sanitizing ROS sinks should no longer be considered "supplemental". They have a 10 year track record of efficacy in	

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					reducing exposure to pathogens that is typically 100X or more effective than traditional, once daily, manual, chemical disinfection.	
Barry Hunt / Humanity	4.5.6.1		te	**4.5.6.1 General**	**4.5.6.1 General** HCFs considering the use of automated disinfection systems or technologies (e.g., mobile, manual UV room disinfection, fixed, automated UV room disinfection, upper-room ultraviolet germicidal irradiation (UVGI), self-sanitizing surfaces/finishes) shall establish an IDT including subject matter experts in engineered infection prevention as well as Infection Control Practitioners. The IDT shall evaluate the following: a) the application (type and purpose of the space) and the proposed system are compatible b) life-cycle costs including maintenance requirements c) estimated reduction in healthcare acquired infections over life-cycle d) estimated patient outcomes, treatment costs, ALOS, bed availability, volume throughput, HBAM funding, life-cycle impact on operational revenue, savings and cost over life-cycle	

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					e) estimated impact on QALY, and patient and family costs over life-cycle f) estimated reduction in community acquired infections over life-cycle g) potential impacts to the health and safety of patients, visitors, and personnel when the system is operating (e.g., use of PPE, HVAC system, sealing room, signage, system safety features); h) compatibility with surfaces after repeated exposure (e.g., some plastic and polymer surfaces); i) the effectiveness of micro-organism reduction; j) turnaround time of the cleaning/disinfection process and impact on occupancy and workflow; and k) likelihood of achieving the intended outcome. **Note:** *See CSA Z317.12 Cleaning and disinfection of health care facilities for further information on evaluation of supplemental disinfection technologies.*	
Barry Hunt / Humanity	4.5.6.2		te	**4.5.6.2 Automated germicidal ultraviolet disinfection systems**	**4.5.6.2 Automated germicidal ultraviolet disinfection systems** Automated germicidal ultraviolet (UV) disinfection systems shall be considered for surface and air disinfection,	

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					particularly for those rooms or areas where there could be an elevated risk of exposure to pathogens (eg - bathrooms, utility rooms, high-traffic areas) or a high risk of susceptibility to infection (eg - BMT, Oncology, ICU, NICU, OR). The IDT shall include subject matter experts in engineered infection prevention when deciding whether and where to install UV systems. See Annex E for further information on UV and visible light disinfection systems. **Note:** *Automated UV systems do not impact the need to clean surfaces at least daily.*	
Barry Hunt / Humanity	5.1.2.3		te	**5.1.2.3 Additional requirements**	**5.1.2.3 Additional requirements** Add: m) CAN/CSA Z317.12 (cleaning and disinfection of health care facilities); and, n) CSA Z305.13 (Plume scavenging in surgical, diagnostic, therapeutic, and aesthetic settings). Any additional CSA standards applying to HCFs shall also be followed. **Note:** *Legal requirements can also apply (e.g., federal, provincial/territorial, and local regulations). The HCF should*	

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					identify the requirements of these and other governing agencies (e.g., worker safety authorities) that could have jurisdiction early in the process.	
Barry Hunt / Humanity	5.1.7.1		te	**5.1.7.1 General** The project development plan shall include, at least, the following workstreams at each project stage (See Clause 5.6):	**5.1.7.1 General** The project development plan shall include, at least, the following workstreams at each project stage (See Clause 5.6): **Add:** 1) Engineered Infection Prevention (EIP) 1) Air, water, surfaces, aerosolization 2) EIP Technologies 3) Measurable Pathogen Exposure Targets 4) CSA Z317.12	
Barry Hunt / Humanity	5.1.7.1		te	**5.1.7.1 General** The project development plan shall include, at least, the following workstreams at each project stage (See Clause 5.6): 1) Environmental (See Clause 5.1.7.6) 1) Climate resilience (See Clause	5.1.7.1 General The project development plan shall include, at least, the following workstreams at each project stage (See Clause 5.6): 1) Environmental (See Clause 5.1.7.6) 1)	

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				5.1.17) 2) Energy and GHG emissions reduction (See Clause 5.1.16) 3) Net zero carbon transition (See Clause 4.6.1.1) 4) Structured sustainability program (See Clause 5.1.15)	Climate resilience (See Clause 5.1.17) 2) Energy and GHG emissions reduction (See Clause 5.1.16) 3) Net zero carbon transition (See Clause 4.6.1.1) 4) Structured sustainability program (See Clause 5.1.15) 5) **Anesthetic Gases**	
Barry Hunt / Humanity	5.1.8.4.1		te	**5.1.8.4.1 General** The project planning process shall include input from an Interdisciplinary Design Team (IDT), patients, families and others from the earliest stages of the project to help ensure that the resulting HCF will meet the needs and expectations of the people who will be using it. The IDT mandate should include flexibility in responding to the changing needs of the health care system and incorporate an iterative design process that can respond to the system needs. **Notes:** ***1)*** *The Interdisciplinary Design Team*	5.1.8.4.1 General The project planning process shall include input from an Interdisciplinary Design Team (IDT) including well-informed patient advocates, patients, families and others from the earliest stages of the project to help ensure that the resulting HCF will meet the needs and expectations of the people who will be using it. The IDT mandate should include flexibility in responding to the changing needs of the health care system and incorporate an iterative design process that can respond to the system needs.	

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				(IDT) is the basis of a human-centered design approach. It involves creation of a design team comprising both subject matter experts (umbrella organization) and professional planners and designers to determine the needs of the organization at all planning and design stages. ***2)*** *They will help inform and work collaboratively with the design team.* ***3)*** *The project planning process should focus on the vision and principles to inform design.* ***4)*** *It should be noted that different resources are required at different times during the project.*	**Notes:** ***1)*** *The Interdisciplinary Design Team (IDT) is the basis of a human-centered design approach. It involves creation of a design team comprising subject matter experts (umbrella organization), professional planners and designers, and well-informed patient advocates, to determine the needs of the organization at all planning and design stages.*	
Barry Hunt / Humanity	5.1.10.2.2		te	**5.1.10.2.2 Facility needs assessment (design/environmental)**	**5.1.10.2.2 Facility needs assessment (design/environmental)** ii) Future state — 1) Projections based on patient profile and past/current practices based on A) demographics/population growth; B) likely 30 year increase in infectious disease due to climate crisis and population growth, C) likely 30 year increase in hospital utilization due to impact of Long Covid and repeat infections on potentiation of acute and chronic diseases due to	

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					cardiovascular effects, pulmonary effects, multi system organ effects, immune dysregulation, oncogenesis, brain function, etc. D) likely 30 year impact on labour shortage in healthcare due to Long Covid, burn out, demographics, policy disputes, etc. E) mitigation factors — technology impact, system change. 2) New services to be provided 3) New accommodations to be provided (e.g., isolation and bariatric strategies)	