Infection Prevention and Control
Healthcare Facility Design Requirements

October 2021

Alberta Health Services

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Table of Contents

Preface

The Alberta Health Services (AHS) Infection Prevention and Control (IPC) – Healthcare Facility Design Requirements document was prepared by the IPC Design and Construction Working Group, a collaboration between IPC and Capital Management. The AHS Clinical Operations Executive Committee (COEC) and Executive Leadership Team (ELT) approved this 2021 version in June and July 2021, respectively. It was subsequently approved by the Joint Steering Committee (Alberta Infrastructure, Alberta Health, and AHS) in October 2021.

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1. Introduction

These requirements were developed to outline relevant sections in various standards such as Canadian Standards Association (CSA) and Facility Guidelines Institute (FGI), as well as describe Alberta-specific practices, protocols, and positions. This document, and the standards they refer to, help establish safe environments for patients and staff by reducing the risk of transmission of infections in settings where healthcare is provided. Use this document to determine Infection Prevention and Control (IPC) requirements when planning and designing new healthcare facilities, and renovating or functionally changing existing spaces.

The application of these requirements must take into consideration the intended Healthcare Facility (HCF) Class (refer to CSA Z8000-18 Annex B), level of care and risk to patient populations. The document applies to all tertiary, acute, community care and long-term care facilities.

In addition to IPC considerations other pertinent guidelines, standards and codes must be included in design, construction and renovation projects. If there is a discrepancy between this document and the CSA Standards, applicable federal, provincial and municipal building codes and regulatory requirements will apply (CSA Z8000-18: 5.1.1.5).

Principles

According to CSA Z8000-18, healthcare facilities shall be planned according to OASIS principles (**O**perations, **A**ccessibility, **S**afety & Security, **I**nfection Prevention & Control, and **S**ustainability). This document focuses primarily on Infection Prevention and Control practices. Refer to CSA Z8000-18, Clause 4.1.1 for a description of these principles.[1]

Participants

This document was developed by IPC and Capital Management representatives from AHS zones and provincial programs, as well as Covenant Health (see participant list).

History of document development

The former *Calgary Health Region, Infection Prevention and Control General Design Guidelines for Calgary Health Region Construction/Renovation Projects 2008* was used as a seed document. To update the Calgary document an extensive review of current published relevant standards, guidelines and information based on evidence was conducted and included in the guideline. This document was refreshed in March 2016, with updated references and revised section on consideration of exceptions.

For the 2021 edition, references were reviewed and updated, and additions of Alberta-specific content was added. Because much of the content within this document is drawn from external sources, only references are provided to help navigate users to the appropriate sections in external sources, rather than repeating the information. Any Alberta-specific guidance is described fully in this document, as are the more obscure references that are more difficult to access.

Also important to note is the separation of design elements from the actual construction requirements (infection control risk assessment and preventive measures). The construction requirements are outlined in a separate document.

This document supersedes previous AHS legacy IPC healthcare facility design documents.

Reference citations

For each topic included in this document there is a list of references to specific clauses in the standard, guideline, or other source. Each reference includes a shortened title and the relevant clause(s) (e.g., CSA Z8000-18: 7.5.5.2). Full document citations can be found in the References at the end of this document.

Language

Most content in the standards and recommendations referenced in this document use the verbs shall, should, and may. “Shall’ is used to express a requirement; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the guidelines (CSA Z8000-18: 1.3).

Future updates

This a living document and is reviewed regularly and updated to ensure the information remains current and in alignment with published IPC standards. The AHS IPC Design and Construction Working Group will be responsible for document control and management of all modifications to this document and may include, but is not limited to:

- updates from new or revised reference standards;
- repetitive requests for similar information;
- outcome tracking of lessons learned and;
- documentation of issues and resolutions that may require changes or additions.

The updated document will be shared for comment and consultation prior to publication.

Exceptions

Exceptions to these requirements are addressed as indicated in Section 5.

1.1 IPC Guiding Principles for HCF Design

Infection prevention and control personnel are essential during all phases of healthcare facility design. The following references outline the importance of IPC involvement and the general IPC requirements when planning construction projects:

- CSA Z8000-18: 4.5.1.2, 4.5.1.3, 4.5.1.4, 7.5.6, 7.5.7[1]

1.2 General IPC Requirements for Separation of Patients

The references below outline CSA requirements for separation of patients. However, within Alberta Health Services, a position statement has been developed that supersedes and simplifies the requirements found in the CSA Z8000-18. The position statement is titled Position Statement on Spatial Separation of Patients in AHS and Covenant Health and is found in Appendix A. The two-metre separation is measured from the edge of one bed to the edge of the adjacent bed.

1.2.1 General – CSA Z8000-18: 7.5.2.1.1, 7.5.2.1.2

1.2.2 Single occupancy – CSA Z8000-18: 4.5.3.1, 4.5.4, 7.5.2.2, 7.5.2.3, 7.5.2.4, 7.5.2.5

1.2.3 Separation of patients in waiting areas – CSA Z8000-18: 7.5.2.7, 9.7.2.3.6

1.3 **Entrances** – CSA Z8000-18: 10.6.3.1

2. Patient Care Area Design

2.1 General

2.1.1 Conduct an infection control risk assessment – CSA Z8000-18: 7.5.1.2

2.1.2 Inpatient bedrooms – CSA Z8000-18: 4.5.3

2.2 Hand Hygiene

2.2.1 Hand Hygiene Station

Sinks, faucets, soap dispensers, hand drying fixtures and waste receptacles are the components of a hand hygiene station. For information on selection of appropriate hand hygiene stations, see Appendix C: Guidelines for Hand Hygiene Sink Requirements.

Hand hygiene station: A hand hygiene station can be either a hand hygiene sink or ABHR hand hygiene station.

Hand washing station: A hand washing station includes a hand hygiene sink, soap dispenser, paper towel dispenser, and waste receptacle

Hand hygiene sink: A sink dedicated for the exclusive use of hand hygiene.

2.2.1.1 General:

- Sinks dedicated to hand hygiene – CSA Z8000-18:7.5.12.1.3
- Public Health Agency of Canada (1.1.1.3, 6.C) states that hand soap and alcohol-based hand rub (ABHR) shall be dispensed from a non-refillable dispenser (i.e., not refilled from a bulk container).
- National Fire Code - Alberta Edition (2019) states ABHR shall be placed in accordance with provincial and local restrictions/guidelines.
- AHS Hand Hygiene Policy states that hand hygiene shall be performed either through the use of ABHR or with soap and water at a hand washing sink. Provision shall be made to allow the use of both.

2.2.1.2 ABHR Hand Hygiene Station Locations – CSA Z8000-18: 7.5.12.3

2.2.1.3 ABHR Placement Requirements:

- CSA Z8000-18: 7.5.12.3.2
- For mounting height information refer to WHS General Ergonomics Best Practices Mounting Heights for Hand Hygiene Products & Sharps in Appendix B.
- For dispenser placement, see ABHR Dispenser Placement Recommendations and Dispenser Placement Algorithm.

2.2.1.4 Hand Washing Station Locations – CSA Z8000-18: 7.5.12.2.1, Table 11.1(19, 31, 32, 46)

2.2.1.4.1 CSA Z8000-18, 7.5.12.2.1 (b, i) interpret as an enclosed room with a door

2.2.1.5 Safety/Risk Mitigation for Mental Health – CSA Z8000-18: 8.4.3.2.1h

2.2.1.6 Scrub sink (distinct from hand washing station) – CSA Z8000-18: 7.5.13

2.2.1.7 Hand Hygiene in Ambulatory Care Facilities – CSA Z8000-18: 9.2.3.9

2.3 Washrooms

A three-piece washroom contains a toilet, vanity sink and shower. A two-piece washroom contains a toilet and vanity sink.

2.3.1 Washroom Requirements

2.3.1.1 General

- CSA Z317.1-16: 8.2.5, 8.2.7
- FGI: 2.1-2.2.6.3

In addition to the above references, note the following:

- Flush pressure should be controlled to minimize the risk of aerosolization. (Barker and Jones, 2005).
- Swing out toilets shall not be used.

2.3.1.2 Inpatient

- CSA Z8000-18: 7.5.8.1, Table 11.1 (25a & 25b)
- Safety/Risk Mitigation for Mental Health – CSA Z8000-18: 8.4.3.2.1h

2.3.1.3 Outpatient

- CSA Z8000-18: Table 9.1 (10)

2.3.2 Staff Toilet Room

- CSA Z8000-18:
  - 8.5.1.2 (Pediatric and adolescent)
  - 8.8.2.5.6 (Complex care)
  - 8.9.2.5.5 (Long-term care)
  - 9.2.3.4 (Ambulatory care)
  - 9.3.3.4.2, 9.3.3.4.3f (Procedure rooms)
  - 9.7.2.5 (Emergency care)
  - 9.13.2.2 (Pharmacy)
  - Table 9.1, 21 (Diagnosis & treatment, including ambulatory care)
  - 10.2.2.3 (Environmental services)
  - 10.5.2.4 (Plant maintenance)
  - Table 10.1, 1d, vii (Medical device reprocessing)
- FGI: 2.1-2.7.2

2.3.3 Public Toilet Room – CSA Z8000-18: Table 11.1 (48); Table 9.1 (14)

2.4 Tub and Shower Rooms

2.4.1 Tub and shower room construction material selection

- CSA Z317.13-17, 5.1.3, 5.1.5, 5.1.7, 5.1.9

2.4.2 Tub and shower room design finishes

- CSA Z8000-18: 12.2.5.2.3, 12.2.5.2.6, 12.2.5.3.7, 12.2.5.4.3

2.4.3 Tub and shower room area requirements

- CSA Z8000-18: Table 11.1, 46 (a, e, g, h, i, j, k, n)
- Design so that water does not flow out of the shower area.
- Engineer sufficient exhaust to limit water condensate.

2.5 Surfaces

2.5.1 General – CSA Z8000-18: 7.2.1, 7.2.2, 12.2.5.1; FGI: 2.1-7.2.4.3

2.5.2 Floors – CSA Z8000-18: 7.2.2.4, 12.2.5.2, 12.2.5.2.2, 12.2.5.2.4; FGI: 2.1-7.2.3.1

2.5.3 Walls – CSA Z8000-18: 7.2.2.5, 12.2.5.3; CSA Z317.13-17, 5.1; FGI: 2.1-7.2.3.2

In addition to the above references, note the following:

- Modular walls shall meet the applicable requirements in the CSA Z8000-18. In addition, modular walls shall not be used where protective coving is required. Refer to Appendix D for the Algorithm for Use of Modular Wall Systems for further guidance.

2.5.3.1 Vinyl Wall Graphics

- For vinyl wall graphics with an opaque image (like wallpaper), CSA Z317.13 shall be followed. Vinyl wall graphics that are primarily transparent are acceptable since any wall damage due to leaking would be visible.
- Vinyl wall graphics may not be as durable as other materials to withstand hospital cleaning. It is important to monitor this, so that when and if the vinyl film is damaged, it is immediately replaced so bacteria cannot grow on the surface.
- Covering vinyl wall graphics with glass may extend the lifecycle of the material, but is problematic if moisture develops between the glass and vinyl wall graphic.

2.5.4 Ceilings – CSA Z8000-18: 7.2.2.3, 12.2.5.4; FGI: 2.1-7.2.3.3

2.5.5 Doors – CSA Z8000-18: 12.2.3.1 (pocket doors)

2.5.6 Corridors and Alcoves – CSA Z8000-18: 4.5.2c, 8.2.3.9

2.5.7 Use of materials with claims of antimicrobial properties should be considered carefully on a case-by-case basis as there is limited evidence that use of such materials reduces hospital-acquired infections.

- onsult with IPC for assistance in evaluating antimicrobial materials.
    - To assist in evaluating new materials, refer to Canadian Standards Association (CSA) Express Document EXP06-2015 Evaluating emerging technologies for infection prevention and control. This document can be downloaded free of charge from the CSA website.
- Base decisions for furniture or item surface selection on a risk assessment of the space and a review of literature on the materials being considered, including:
    - products registered with United States Environmental Protection Agency and Health Canada Pest Management Regulatory Agency (e.g., Metallic Copper).

2.6 Utility/Support Areas

All Medical/Surgical units, Critical Care Units, Operating Rooms, Emergency Departments and Outpatient/Ambulatory Care Clinics and Continuing Care require the following utility/support areas. Each support area shall be in a physically distinct room.

2.6.1 Soiled Utility Room – CSA Z8000-18: Table 11.1 (39), Table 9.1 (13)

2.6.2 Clean Supply Room – CSA Z8000-18: Table 11.1 (8); Table 9.1 (12c)

2.6.3 Clean Linen Storage Area – CSA Z8000-18: Table 11.1 (8)

2.6.4 Housekeeping Service Room – CSA Z8000: Table 11.1 (22)

2.6.5 Housekeeping Closet – CSA Z8000: Table 11.1 (21)

2.7 Waste Management – CSA Z317.10 (CSA Z8000: 7.5.7)

2.8 Human Waste Management – CSA Z8000-18: 7.5.8

2.9 Equipment Storage – CSA Z8000-18: 7.7.1.7

2.10 Storage of Personal Protective Equipment (PPE) [CSA Z8000, 5.2.2b), 7.5.1.5a)]

In addition to storage of PPE in clean utility rooms, secured PPE storage shall also be located in decentralized areas on the unit.

2.10.1 For inpatient units, a storage space (alcove, recess, or cabinet) for personal protective equipment shall be located in the corridor outside the patient room.

2.10.2 For ambulatory care units, a storage space (alcove, recess, or cabinet) for personal protective equipment shall be located in appropriate locations for efficient staff work flow.

2.10.3 Further PPE storage requirements (e.g., alcove shared between rooms, cabinets) for specific departments can be found in Section 2.11 and 2.12.

Note: Alcoves can provide additional space for waste bins and soiled PPE hampers.

2.11 Inpatient and Related Services

2.11.1 Medical/Surgical – CSA Z8000: 8.1

2.11.2 Critical Care – CSA Z8000: 8.2, 7.5.8.1; FGI: 2.2-2.6.2.6

2.11.3 Maternal and Newborn – CSA Z8000: 8.3; FGI: 2.2-2.9, 2.2-2.10

2.11.4 Mental Health – CSA Z8000: 8.4, FGI 2.2-2.12

2.11.5 Pediatric and Adolescent – CSA Z8000: 8.5

2.11.6 Rehabilitation Care – CSA Z8000: 8.6

2.11.7 Burn Unit – CSA Z8000: 8.7

2.11.8 Complex Care – For complex care in continuing care facilities, refer to the Design Guidelines for Continuing Care Facilities in Alberta (Alberta Health).

2.11.9 Continuing Care – For Alberta-specific requirements, refer to the Design Guidelines for Continuing Care Facilities in Alberta (Alberta Health).

2.11.10 Inpatient Observation Rooms

For the purposes of this document, inpatient observation room is defined as a multi-bed patient care area on an inpatient unit with an expected length of stay from 24 to 48 hours. The intended use is for observation and stabilization of patients on either step-up or step-down units requiring special care or extra observation. Each patient space in an observation room may be separated by a curtain, walls on three sides or a combination of both.

2.11.10.1 **Exception**: Mental Health observation rooms shall always be single patient bed (CSA Z8000-18: 8.4.3.4.1).

2.11.10.2 Patient rooms other than observation rooms shall be single patient bed (CSA Z8000-18: 4.5.3.1, 7.5.2.2). See 1.2.2.

2.11.10.3 Observation rooms shall be designed to provide a minimum of 2000 mm of distance between beds. See 1.2.

2.11.10.4 Every effort should be made to adhere to one patient per two-piece toilet room.

2.11.10.5 In a location designed to accommodate three or more patients at a time: minimum of one hand hygiene sink for every three patients, with no more than 6 m distance between any patient station and the nearest sink; (CSA Z8000-18: 7.5.11.2.1, b).

2.11.10.6 Observation rooms may share utility support rooms within a clinical unit. (FGI 2018: 2.2-3.2.8.2).

2.12 Diagnostic and Treatment Services (includes Ambulatory Care)

2.12.1 Diagnostic and Treatment, General Requirements

2.12.1.1 Risk categories – CSA Z8000-18, 9.1.1.2

2.12.1.2 Ventilation standards – CSA Z317.2-19: Table 1

2.12.2 Ambulatory Care Facilities – CSA Z8000-18, 9.2.3

2.12.3 Operative and Non-operative Procedures – CSA Z8000-18, 9.3.7

2.12.4 Dialysis – CSA Z8000-18, 9.4.3.5

2.12.5 Oncology – CSA Z8000-18, 9.5.3.9

2.12.6 Endoscopy Services – CSA Z8000-18, 9.6.7

2.12.7 Emergency Care – CSA Z8000-18, 9.7.3.3

2.12.8 Allied Health – CSA Z8000-18, 9.8.3.4

2.12.9 Electrodiagnostic Services – CSA Z8000-18, 9.9.3.4

2.12.10 Respiratory Services (aerosol-generating procedures) – CSA Z8000-18, 9.10.3.1

2.12.11 Medical Imaging – CSA Z8000-18, 9.11.3.6

2.12.12 Clinical Laboratory – CSA Z8000-18, 9.12.3.12

2.12.13 Pharmacy – CSA Z8000-18, 9.13.3.4

2.12.14 Outpatient Observation Rooms

For the purposes of this document, outpatient observation room is defined as a multi-bed patient care area in an emergency department or outpatient area with an expected length of stay up to 24 hours. The intended use is for observation, assessment and stabilization of patients needing special care or extra observation to evaluate a patient's condition to determine the need for admission. Each patient space in an observation room may be separated by a curtain, walls on three sides or a combination of both.

2.12.14.1 **Exception**: Mental Health observation rooms shall always be single occupancy.

2.12.14.2 Observation rooms shall be designed to provide a minimum of 2000 mm of distance between beds. See 1.2.

2.12.14.3 There shall be a minimum of one patient toilet room (two piece) per eight treatment spaces (CSA Z8000-18: 9.7.2.4.10).

2.12.14.4 In a location designed to accommodate three or more patients at a time: minimum of one hand hygiene sink for every three patients, with no more than 6 m distance between any patient station and the nearest sink; (CSA Z8000-18: 7.5.11.2.1, b).

2.12.14.5 Observation rooms may share utility support rooms within a clinical unit (FGI 2018: 2.2-3.2.8.2).

2.13 Special Design Elements

2.13.1 Plants – CSA Z8000-18: 6.2.1.7.4, 6.2.1.7.5

As indicated in the above clauses, a risk assessment shall be done by a multidisciplinary team to address patient safety concerns including but not limited to IPC, FME, WHS, Patient Safety, Clinical Microbiology and others as appropriate.

The risk assessment should also consider the type of system including:

- **Living wall**: Systems that use hydroponics may lower the risks of soil-associated pathogens since soil is not used, Soil substitutes may also harbour pathogens and incur patient risk. Systems that drain the water immediately rather than recirculating may also lower the risk of water-born organisms. If considered, a water management program is required.
- If a **green roof** is being considered, refer to Alberta Infrastructure Green Roof Design.

Living wall: A wall partially or completely covered with greenery that includes a growing medium (e.g., soil, water, and substrate) and an integrated water delivery system.

Green roof: A roof of a building, partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems.

Extensive system: (60-200 mm) Most require little or no permanent irrigation after establishment. Often not publically accessible, however they may be designed for appealing views from within a building.

Intensive system: (200-600 mm) Often requires permanent irrigation. Typically are publicly accessible (e.g., hospital healing gardens).

2.13.2 Decorative Fountains and Fish Tanks

- FGI: 2.1-7.2.2.14 (1&2)
- FGI 2.2-3.12.7, 2.2-2.3.7.1 (Oncology)

In addition to the above references, note the following:

- Avoid placement in patient care areas and ensure proper maintenance when used in public areas (CDC: Recommendations Water I E).
- Decorative fountains can pose infection risk (APIC Text Online 116).

2.13.3 Artworks

A risk assessment should be conducted before art is chosen to ensure the materials and finishes are safe for the healthcare environment and the planned location of the artwork is appropriate. There shall be a written plan for regular cleaning and maintenance. Refer to Appendix E, *IPC Risk Assessment Matrix for Artworks*.

3. Clinical Support Services

3.1 Facility Linen Management

Guidance on design of linen services can be found in:

- CSA Z8000-18: 10.2
- CSA Z314-18: Section 20; Annex U
- CSA Z317.2-19 Table 1 (21)

3.2 Medical Device Reprocessing Area

Guidance on design of medical device reprocessing (MDR) services:

- CSA Z8000-18: 10.7
- CSA Z314-18: Section 10
- CSA Z317.2-19: Table 1 (24)

4. Building Systems

4.1 Plumbing

All plumbing shall meet standards outlined in the most current Technical Design Requirements for Alberta Infrastructure Facilities, local regulations and CSA Z317.1 Special Requirements for plumbing installations in healthcare facilities.

4.2 Air Handling

Air handling shall meet standards outlined in the most current Technical Design Requirements for Alberta Infrastructure Facilities and Canadian Standards Association CSA Z317.5 19 Special requirements for heating, ventilation and air conditioning (HVAC) systems in HCF.

For different air handling requirements refer to CSA: Z317.2-19, Table 1.

4.3 Medical Gases

All medical gases shall meet standards outlined in the most current Canadian Standards Association. Z396.1-17. Medical gas pipelines systems- part 1: Pipelines for medical gases and vacuum. Relevant clauses include 4.3, 4.4, 5.8, A5.6.2.1.6

Airborne Isolation Rooms (AIR)

4.3.1 General – CSA Z317.2-19: 6.10.4; CSA Z8000-18: 7.5.5

4.3.2 G1Requirements Healthcare Facilities

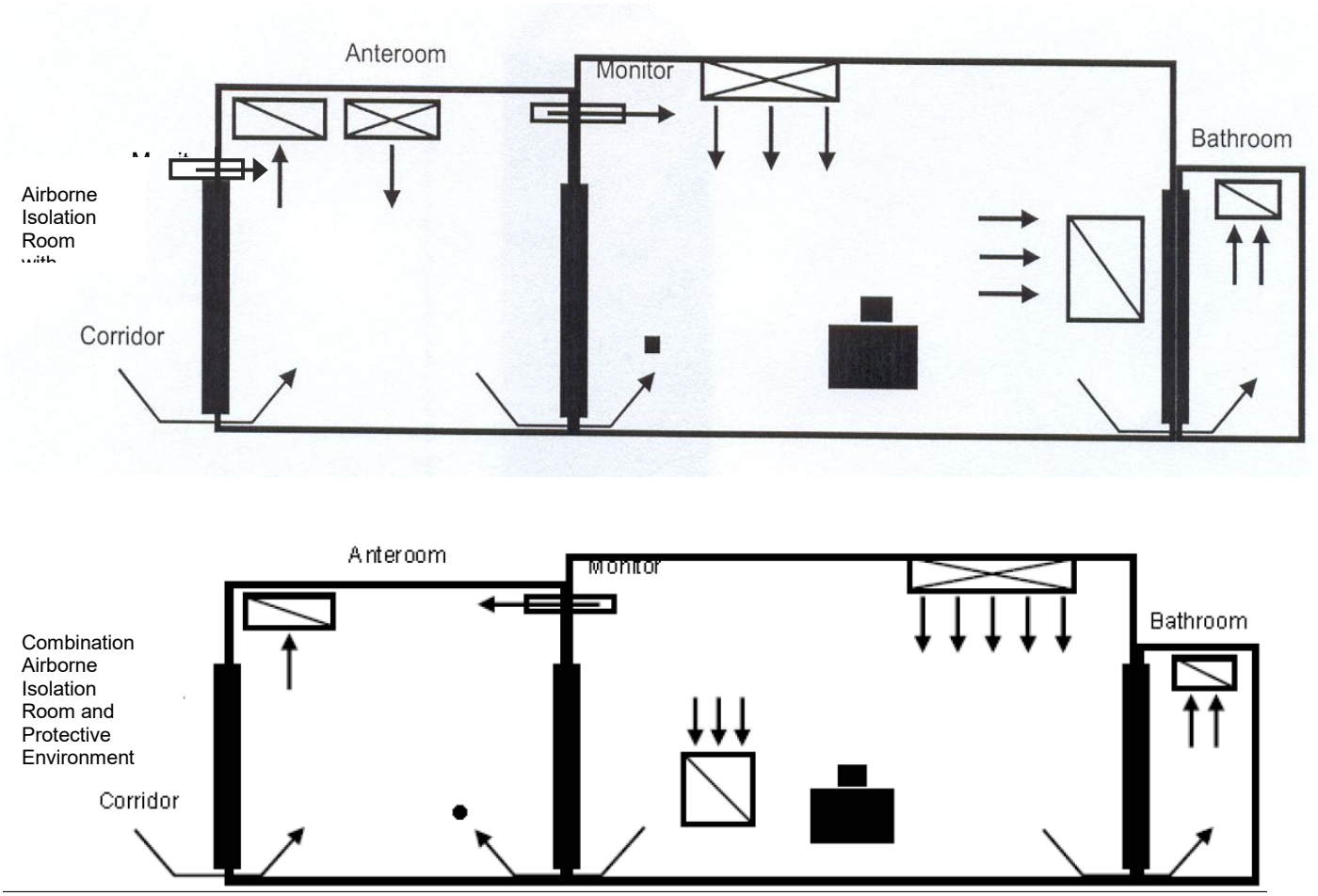
- CSA Z8000-18: 7.5.5.1 (intensive care unit)
- CSA Z8000-18: Table 11.1 (26) (inpatient units)
- CSA Z8000-18: 7.5.5.2, 7.9.9.2 (emergency department)
- CSA Z8000-18: Table 11.1 (15) (examination/treatment room – Isolation), refer also to 7.5.5.6 and note below.
- CSA Z317.2-19: 6.11.3.3 (operating room)

Note: All airborne isolation rooms “shall have an anteroom” (CSA Z8000-18: 7.5.5.6)

4.4 Protective Environment Rooms and Combination AIR/Protective Environment Rooms

4.4.1 General – CSA Z317.2-19: 6.10.4; CSA Z8000-18: 7.5.5.10, 7.5.6; FGI: 2.2-8.2.3 (5)

Diagrams of Airborne Isolation Rooms



Used with permission of A. Streifel, University of Minnesota (Guidelines for Environmental Infection Control in Health-Care Facilities, CDC, 2003, Updated 2019). Adapted for this requirement.

5. Exceptions to the Requirements

During planning, design, and construction/renovations, a multidisciplinary team may encounter challenges in meeting the requirements and recommendations of the design sections of these requirements and an exception may be considered necessary. Challenges that may lead to exception consideration include:

- clinical request;
- constraints of an existing footprint/infrastructure;
- financial resources.

Exceptions may be minor, such as a modifications, additions, or variations not deviating significantly from the plans and specifications or the requirements of these guidelines. Examples may include:

- minor construction changes not impacting overall design, cost, or IPC principles;
- substituting comparable products.

More major exceptions that significantly deviate from the plans, specifications, or requirements of these guidelines may also be considered and may include:

- use of multi-patient care rooms versus single patient rooms design;
- decreasing the number of required hand hygiene sinks;
- requirements posing major impacts to fiscal resources.

The exception process described below is intended for consideration of exceptions to design, not preventive measures during construction.

Any member of the multidisciplinary team may bring forward a potential exception for consideration. Where an exception to a requirement or recommendation within this guideline is perceived as necessary, the process outlined in this section shall be followed. The extent of the process depends upon the magnitude of the exception being considered.

5.1 Exception Consideration Process

The Exception Consideration Process shall be managed by the multidisciplinary team, led by the team chair. The multidisciplinary team may use the "Exception to Guideline Decision Algorithm" in Figure 1 to guide the exceptions process, which includes escalation levels if resolution cannot be reached at previous levels.

5.1.1 Level 0

Potential exceptions are discussed at the multidisciplinary team level through consultation between Infection Prevention and Control (IPC), the project manager (either AHS/Covenant or Alberta Infrastructure), clinical and administrative staff, and other stakeholders, as appropriate. Most exceptions should be resolved at this level, as escalation to Levels I and II could result in delays to the project and subsequent additional operational and cost implications.

A risk assessment using the Exceptions Tracking and Risk Assessment (ETRA) Tool may be used to guide decision-making and is in the form of an Excel spreadsheet (see Figure 2 for a sample), which is provided electronically on the webpage housing the full Requirements.

Exceptions approved at the multidisciplinary team level shall be documented. The ETRA Tool may be used for documentation by the multidisciplinary team.

5.1.2 Escalation Level I

Any exception not resolved at the multidisciplinary team level should be escalated to this level (as indicated in the Exception to Guideline Decision Algorithm) and requires consultation between those in leadership over staff on the multidisciplinary team (zone level) to seek an acceptable compromise. Participants at this level may include:

- Project Steering Committee (for capital projects involving Alberta Infrastructure)
- Clinical Team
- Site Administration
- Senior Project Manager/Senior PM Director
- IPC Clinical Practice Coordinator/IPC Director
- IPC Executive Director

Participants in Escalation Level I review the ETRA Tool completed by the multidisciplinary team in Level 0 and attempt resolution.

Exceptions approved at Escalation Level I shall be documented. The ETRA Tool may be used for documentation by the multidisciplinary team.

5.1.3 Escalation Level II

Any exception not resolved in Level I should be escalated to this level (as indicated in the Exception to Guideline Decision Algorithm) and requires consultation between those in leadership at the provincial level to seek resolution. Participants at this level may include:

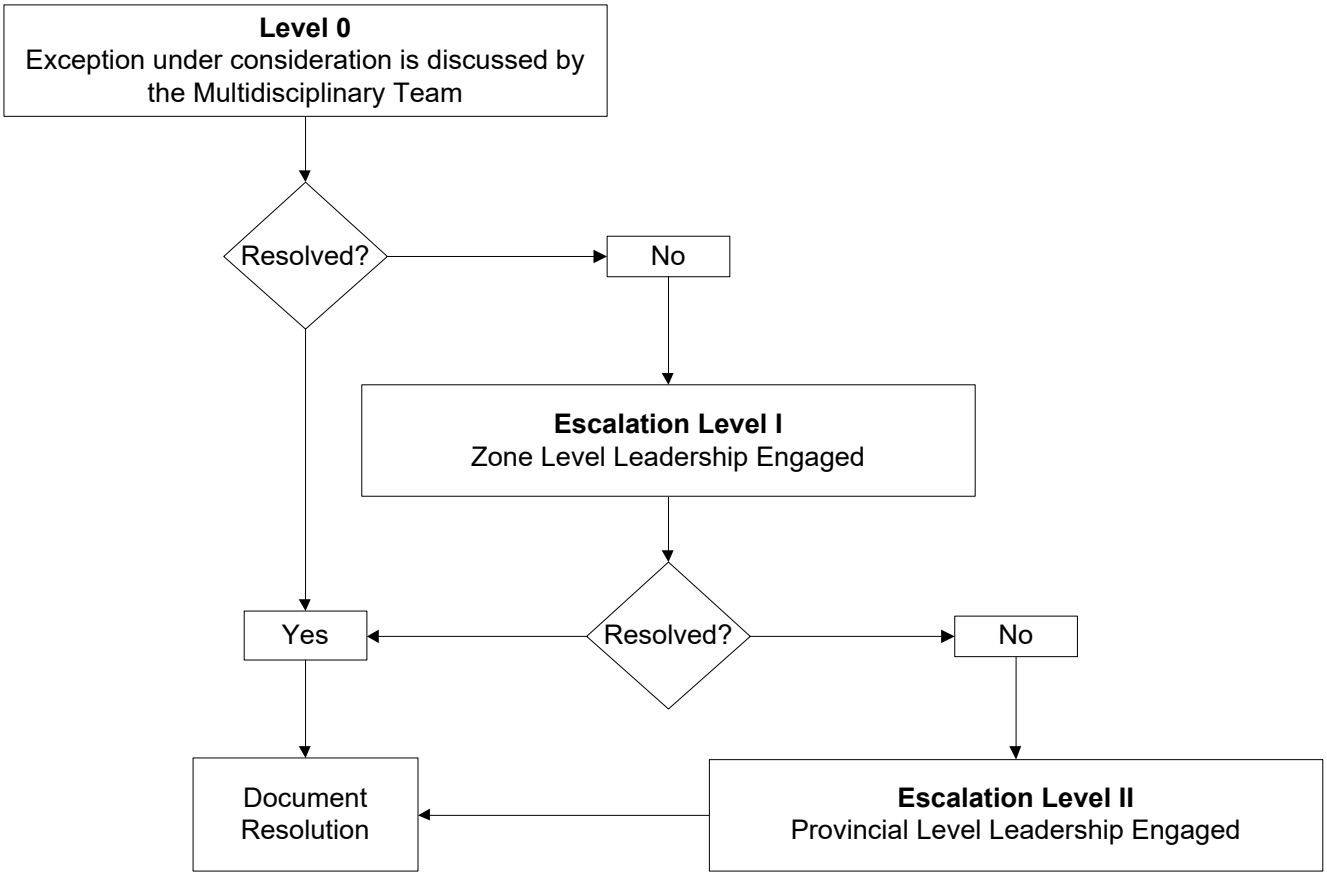
- Operational Zone Lead
- Medical Directors (Operations, IPC, etc.)
- Capital Management Zone Directors
- AHS/Covenant Senior Executives
- Alberta Infrastructure Senior Executives

The ETRA Spreadsheet reviewed in Level I is reviewed again and a final decision made.

Exceptions approved at Escalation Level II shall be documented. The ETRA Tool may be used for documentation by the multidisciplinary team.

Figure 1

Exceptions to Design Requirements Decision Algorithm



Approvers and Roles by Escalation Level		
Escalation Level	Approvers	Role
0	Multidisciplinary Team Members • Clinical User • Facilities, Maintenance, & Engineering • Project Manager (either AHS/Covenant or Alberta Infrastructure) • Infection Control Professional	• Review conditions on site and define issue • Explore options using Exceptions Tracking & Risk Assessment (ETRA) tool • If an exception is made, document resolution
I	May include: • Project Steering Committee • Clinical Team • Site Administration • Senior Project Manager/Senior PM Director • IPC Clinical Practice Coordinator/IPC Director • IPC Executive Director	• Review ETRA Tool (completed by Multidisciplinary Team) • Provide a zone view and make decision • Multidisciplinary Team Chair documents resolution
II	May include: • Operational Zone Lead • Medical Directors (Operations, IPC) • Capital Management Zone Directors • AHS Senior Executives • Alberta Infrastructure Senior Executives	• Review ETRA Tool • Provide provincial view and consider impact on organization and make decision • Multidisciplinary Team Chair documents resolution

Figure 2

Exceptions Tracking and Risk Assessment (ETRA) Tool

The tool below is a sample of the Exceptions Tracking and Risk Assessment (ETRA) Tool to guide decision-making regarding exceptions. Use the electronic version, which can be downloaded from the webpage housing the full requirements. The electronic version comes with tutorial pop-up notes on various cells that provide instructions on how to complete the tool.

Exceptions to the Guidelines Worksheet

Date	*Requester and Contact Information (Project Team Chair)*	*Zone*	*Facility*	*Area*	*Project*	*Guidelines Section Number*	*General Description of the Issue*

	OPTIONS FOR RESOLVING ISSUES FOR THE EXCEPTION UNDER CONSIDERATION			***Final Decision***
	Risk Assessment			
	Assessment of Current Guidelines Requirements	OPTION 1	OPTION 2	***Indicate if the Exception was approved and which option was chosen.***
	Description:	Description of Option:	Description of Option:	
	In the cells below, describe in detail potential risks for each OASIS Principle, budget implications, and any other considerations. Use format painter to fill the cell with the corresponding color on the heat map legend below to categorize risk.	*In the cells below, describe in detail potential risks for each OASIS Principle, budget implications, and any other considerations. Use format painter to fill the cell with the corresponding color on the heat map legend below to categorize risk.*	*In the cells below, describe in detail potential risks for each OASIS Principle, budget implications, and any other considerations. Use format painter to fill the cell with the corresponding color on the heat map legend below to categorize risk.*	
	Low	*Low*	*Low*	
	Medium	*Medium*	*Medium*	
OASIS Principles	*High*	*High*	*High*	
O Operations: creating an operating environment that promotes the efficient and effective delivery of health care services, thereby helping to ensure positive patient outcomes				
A Accessibility: creating an environment that facilitates the patient's access to receiving care and the caregiver's ability to provide care				
S Safety & Security: creating an environment of care that is safe and secure for all occupants (patients and their families, staff and visitors)				
I IPC: creating an environment that is safe for all building occupants in terms of the prevention of health care acquired infections & the control of infectious diseases				
S Sustainability: taking into account the sustainability of the construction process and the finished building, and the sustainable operation of the HCF over time				
Budget Implications				
Other Considerations				

Appendix A: Separation of Patients Position Statement

Position Statement on Spatial Separation of Patients in AHS and Covenant Health

Note: If you have any questions or comments contact IPC at ipcsurvstdadmin@ahs.ca.

Best practice recommendations

Background

Healthcare facilities must promote and support an environment that is safe for patients/residents, visitors and healthcare workers[1]. With the emergence of antibiotic-resistant organisms (AROs), *Clostridium difficile* infection (CDI), outbreaks of viral hemorrhagic fever (VHF) and respiratory illnesses such as influenza and severe acute respiratory syndrome (SARS), there is increased need to isolate patients (CNISP – unpublished data). There are several examples of transmission of pathogens occurring between patients residing in beds that are not optimally separated[3,4]. The move to single patient rooms and attention to spatial separation between beds helps reduce cross contamination of pathogens[4]; therefore, single patient rooms in healthcare facilities (HCF) with adequate spacing is recommended by a variety of standards and expert bodies as a key strategy to decrease transmission of pathogens, reducing the risk of healthcare-acquired infections[6,7,8].

The recommendations for single rooms and spatial separation in Alberta Health Services (AHS) Infection Prevention and Control (IPC) Healthcare Facility Design Recommendations and Preventative Measures for Construction, Renovation and Maintenance Activities are informed by research and these expert bodies' recommendations[9]. Specific recommendations for 2 meter spatial separation are also provided in the AHS/Covenant IPC Routine Practices, Contact and Droplet Precautions Information Sheets, as well as the IPC Cohorting and Overcapacity Guidance documents located on the AHS/Covenant IPC Website[10].

1. **General IPC design recommendations for separation of patients**
   - The HCF design shall provide for patient separation as needed for IPC purposes.
   - The HCF design shall provide sufficient space in clinical areas so that the necessary distances can be maintained between patients.
   - All patient treatment spaces (inpatient or outpatient) shall be single occupancy unless the functional program demonstrates the necessity of multi-patient arrangements.
   - Single occupancy means that patients have a spatial separation and a physical barrier between them: sufficient to provide privacy, protection from the spread of infections, and adequate area to support the clinical function.
   - A functional program shall demonstrate the necessity of multi-patient arrangements. The multi-patient room shall accommodate no more than two patients.
   - For multi-treatment spaces, there shall be at least 2 meters between beds and/or treatment chairs.
   - Bed clearance space provided for each clinical patient shall be no less than 2 meters apart.
2. **Process for assessing alternatives for separation of patients**
   - IPC concepts must be included in the decision-making process of seeking alternatives when addressing solutions for managing capacity issues.
   - Early consultation with IPC is imperative to this process. Follow the AHS IPC/Covenant Health Construction and Design Recommendations including the established exceptions process (ETRA) with all stakeholders.
   - Decisions to modify purpose-built single patient rooms into two bed or multi-bed rooms with inadequate spatial separation should acknowledge the risk these actions pose to patients and safety of healthcare provider.

For more information contact
ipcsurvstdadmin@ahs.ca

Original date: April 2019
Revised date: June 2020

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Infection Prevention & Control

Appendix A cont.

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For more information contact
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Original date: April 2019
Revised date: June 2020

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Appendix A cont.

Position Statement on Spatial Separation of Patients in Alberta Health Services | 3

For more information, contact:
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IPCSurvStdAdmin@albertahealthservices.ca

Created: April 2019
Updated:

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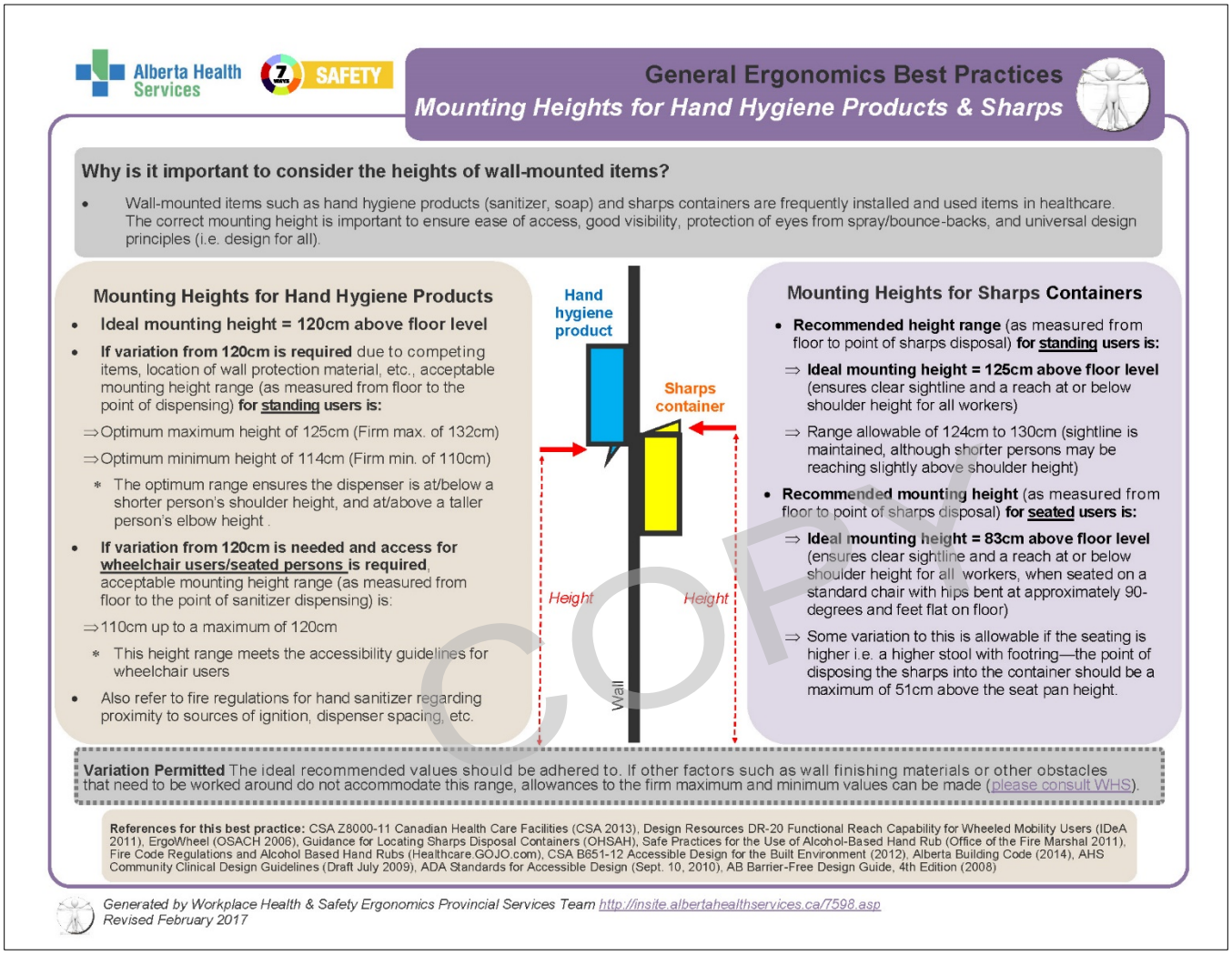
Appendix B: Mounting Heights for Hand Hygiene Products



Appendix C: Recommendations for Hand Hygiene Sink Requirements

Recommendations for Hand Hygiene Sink Requirements

Note: These recommendations are intended to be used with and supplement the Healthcare Facility Design Recommendations.
If you have any questions or comments contact IPC at ipcsurvstdadmin@ahs.ca.

Best practice recommendations

Appropriate sink and faucet size, composition, and design will help minimize contamination of surrounding areas - due to splash or aerosolization - and re-contamination of hands during hand hygiene through inadvertent touching of components.

1. Product evaluation

   AHS and Covenant Health staff responsible for purchasing new sinks and faucets for handwashing should follow these recommendations. Infection Prevention and Control should be consulted when evaluating and purchasing new sinks and faucets. This will ensure that products purchased do not increase the potential for transmission of infectious agents to patients or staff. If additional guidance or clarification is required, IPC personnel in the applicable facility or zone should be contacted.

2. Definition

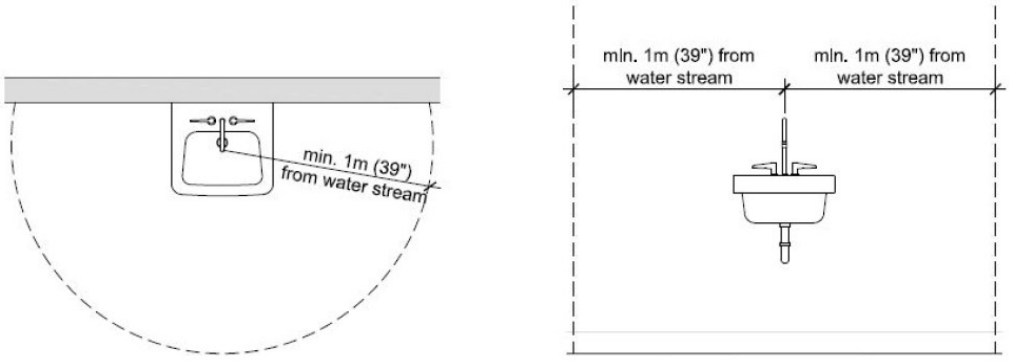
   Hand hygiene sink (HHS): A sink that is designed for effective and efficient cleaning of the hands while restricting splashes and the spread of aerosols, and that is dedicated exclusively for the purposes of hand hygiene.
   Note: A handwashing station includes a hand hygiene sink, soap dispenser, paper towel dispenser and waste receptacle. (1)

3. Installation of handwashing stations

   - Hand hygiene sinks shall be wall-mounted and not inserted into or immediately adjacent to acounter.(1)
   - Hand hygiene sinks shall be installed at least 865 mm (34 in.) above the floor.(1) For barrier-free requirements, see Section 10.
   - Due to the risk of splash, sinks shall be located at least 1 metre (39 in.) from patients, clean supplies, adjacent counters,(1) from curtains, and from sources of extrinsic contamination such as clinical rim flushing sinks or hoppers.

     Note: The 1 metre distance is measured from the water stream horizontally.

Figure 1 – One meter splash zone



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Version	Date (YYYY-MM-DD)
Created	2011-07-05
Updated	2019-17-19
Revised	2020-05-31

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- If the existing footprint does not allow a 1 metre (39 in.) distance, a splash barrier shall be used. (1)
- Seamless backsplashes are required behind the basin and on adjacent wall surfaces to contain splashing, reduce microbial growth, and facilitate cleaning. All edges shall be sealed with a waterproof barrier. Backsplashes shall extend a minimum 600 mm (24 in.) above sink level and shall extend to meet the floor coving. Backsplashes shall include the area under the papertowel dispenser and soap dispenser. (1)
- A mounting height of 1200 mm (47 in.) from floor to point of dispensing, for paper towel dispensers and soap dispensers meets requirements for both standing and wheelchair users. For more information refer to AHS document "Ergonomics Best Practices - Mounting Heights for Hand Hygiene Products and Sharps" (Refer to AHS Insite>Home>Teams> Human Resources>Working Safely (WHS)>Resource Index (A - Z)>Ergonomics>Ergonomics Resource Library>Mounting Heights for Hand Hygiene Products and Sharps).(5)
- To minimize splashing, water pressure should be adjusted to reduce forceful discharge at maximum flow. (3)
- Adequate drainage flow rate shall be provided to ensure the removal of soap residue.(1)

For a listing of healthcare areas where hand hygiene sinks are required, refer to the Hand Hygiene Section in the "AHS IPC Health Care Facility Design Recommendations".(4)

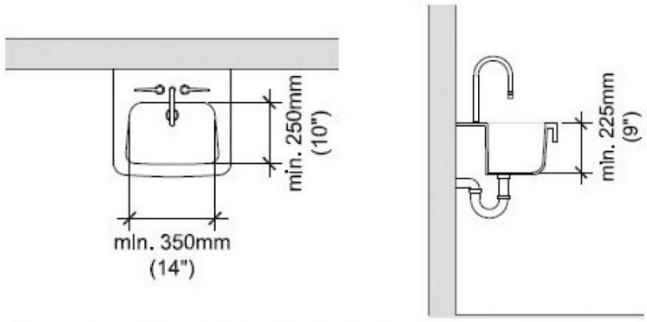
4. Selection criteria for basins

Design requirements for hand hygiene sink basins include the following:

- The sink should have a basin depth of at least 225 mm (9 in.) to prevent splashing ofsurrounding areas (1) and to prevent bumping of hands while performing hand hygiene.
- The minimum inside sink basin dimensions should not be less than 350 mm (14 in.) by 250 mm (10 in.) to minimize contact and to prevent recontamination (from splashing) during use.(1) For oval designs, and designs with rounded corners, these distances should be measured at the widest point.

  Note: Adequate clearance for handwashing mitigates the risk of contaminating the hands through inadvertent touching of sink and fixtures.

Figure 2 – Basin dimensions



- The front to back dimension of the sink basin shall allow easy reach to faucet blade handlesand soap dispenser.

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Version	Date (YYYY-MM-DD)
Created	2011-07-05
Updated	2019-17-19
Revised	2020-05-31

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- The sink basin shall be made of solid, non-porous materials, (e.g., porcelain, enamel, vitreous china, or 18 gauge or thicker stainless steel) [1] and shall be scratch resistant.
- Porous materials (e.g., granite or marble) shall not be used.[1]
- Inside contour of basin should allow for easy cleaning and maintenance.
- The drain shall be offset from the faucet and water flow. When water falls from the faucet it shall not flow directly into drain as this causes splashing.[1]
- Basin rim shall be of minimum width and sloped to the inside of the basin to prevent the placement of objects on the rim.[1]
- Basin shall be designed to prevent pooling of water.
- Sink basin shall not have an overflow.[1]

  Note: Overflows are difficult to clean and become contaminated very quickly, serving as reservoirs of bacteria. [1]
- Sink drain shall not be able to take a plug. Strainers shall not be used.[1]

  Note: Fine mesh strainers can easily become contaminated with bacteria [1] Open grid strainers are acceptable. [2]
- Traps shall be metal. Gaskets at the sink/drain connection shall be plastic or neoprene. Natural rubber gaskets shall not be used. Trap size shall be 40 mm (1.5 in. in diameter.)[1]

  Note: Trap size affects drainage time and water flow time.[1]

5. Selection criteria for faucet fixtures

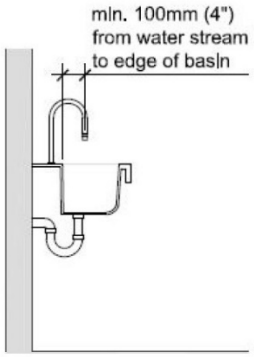
   Proper fixtures for dedicated hand hygiene sinks, when combined with an acceptable basin design, minimize contamination of surrounding area through splash and aerosolization. Adequate clearance for handwashing mitigates the risk of contaminating the hands through inadvertent touching of sink and fixtures.

   Criteria for selection of faucets include the following:

   - Shall provide suitable clearance between water flow and sides of the basin to avoid bumping. A minimum distance of 100 mm (4 in.) is recommended.

     Note: A gooseneck faucet radius of 100 mm (4 in.) is not sufficient, as the actual clearance will be less due to where the faucet is mounted.

   Figure 3 – Faucet clearance



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Version	Date (YYYY-MM-DD)
Created	2011-07-05
Updated	2019-17-19
Revised	2020-05-31

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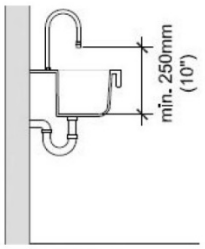
- The distance between the water discharge point of the faucet to where it touches the basin shall be at least 250 mm (10 in.).[3]

Figure 4 – Discharge distance



- Faucets shall be stationary and not swivel.[1]
- Faucet mouth shall not pool water.
- All faucets shall be equipped with non-aerated splash-free, laminar flow devices.[2] Faucets shall not have aerators/modulators/rose sprays.[1]

  Note: Aerators can easily become contaminated with bacteria.[1]
- Hands free operable controls (e.g., electric eye, foot pedal) or faucet blade controls shall be used[1] and the following specifications apply:
  - A means shall be provided to control the water temperature.[1] Optimal water temperature should be achieved quickly since cold water leaves soap residue.
  - If an electronic sensor is used, faucet shall be capable of operating during power failures.[1]
  - When an electronic sensor is used:
    - There shall be sufficient clearance between position of hands (when triggering water flow) and the faucet mouth to avoid bumping.
    - Hand position shall be level with sink rim or below to minimize splashing.
  - If faucet blade controls are used:
    - Blade handles shall be no less than 150 mm (6 in.) in length.[1]
    - Blade handles shall not interfere with handwashing when faucet blade controls are in the open position.

6. Soap dispensers
   - Liquid soap dispensers shall be mounted to permit unobstructed access to minimize splashes or drips onto adjacent wall and floor surfaces, and shall be placed to prevent splash-up contamination.[1]
   - The soap dispenser shall be mounted within easy reach, considering the overall dimensions of the sink.
   - Lotion and alcohol-based hand rub (ABHR) dispensers shall be clearly labelled and physically separate from a hand hygiene sink to avoid confusion of products.[1]
7. Selection criteria for hand drying fixtures
   - A dispenser for single use paper towels shall be provided.[1] A "no touch" design is preferred and should operate so that only the towel is touched when dispensing.
   - Air hand dryers shall not be used in patient care areas.[1]
   - Air hand dryers are only permitted in public washrooms with a hands-free entrance outside of patient care areas.[1]

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Version	Date (YYYY-MM-DD)
Created	2011-07-05
Updated	2019-17-19
Revised	2020-05-31

Alberta Health Services
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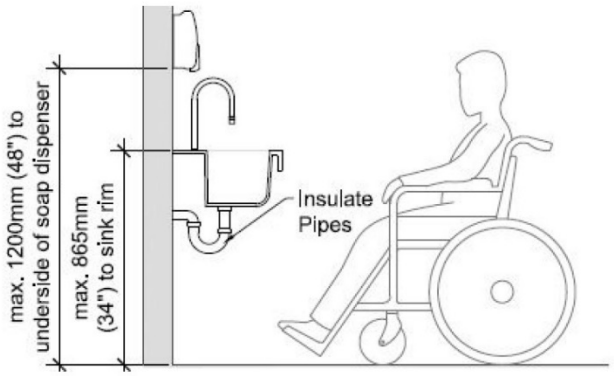
8. Waste receptacles
   - A waste receptacle shall be in close proximity to the hand hygiene sink.(1)
   - To avoid recontamination of hands, paper towels should be available to use on the exit door hardware and a waste receptacle for used towels should be located near the exit door.(1)
   - Waste receptacles shall be a corrosion free material and wide mouth design.(1)
9. Cleaning and disinfection of handwashing station

   All components of a handwashing station (basin, faucet, paper towel dispenser, soap dispenser, waste receptacle) shall be able to withstand frequent cleaning with low level disinfectants currently provided and used in AHS and Covenant Health facilities.
10. Barrier-free handwashing stations

    The following are specific requirements for hand hygiene sinks that are accessible to persons in wheelchairs:
    - Minimum knee clearance: The distance from the floor to the bottom of the basin should be 685 mm (27 in.). This distance is measured at a point 205 mm back from the front edge.
    - The standard barrier-free sink rim height is 865 mm (34 in.)(6), which is only achievable with a shallower basin. For installation of hand hygiene sinks using a basin depth of 230 mm (9 in.), minimum sink rim height is 915 mm (36 in.).
    - Maximum height for dispensers shall be 1200 mm (47 in.).(6)
    - The soap dispenser shall be mounted in an accessible location (i.e., easy to reach from front to back or side).
    - Controls shall be automatic.(6)
    - Exposed parts of hot water and drain pipes shall be insulated or guarded.(6)

      Note: Some shrouds can interfere with leg clearance. If pipes are insulated, a person can move in closer by placing their legs on either side of the pipes.
    - Adequate clear floor area, and knee and toe clearance below the basin shall be provided. Refer to Alberta Safety Codes Council - Barrier-Free Design Guide.(6)

Figure 5 – Barrier-free and washing station



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Version	Date (YYYY-MM-DD)
Created	2011-07-05
Updated	2019-17-19
Revised	2020-05-31

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11. Summary of key requirements for basins and faucets

	Specifications		
✓	**Basin**	**Metric**	**Imperial**
	Basin dimensions (min.)	**350 x 250 mm**	**14 x 10 in.**
	Basin depth (min.)	**225 mm**	**9 in.**
	Solid, non-porous material		
	Offset drain from water flow		
	Rim – min. width and sloped inside so no objects can rest on it		
	Shaped to prevent pooling of water		
	No overflow, strainers, not able to take a plug		
	Metal traps; 40 mm (1.5 in.) in diameter		
	Plastic or neoprene gaskets (not rubber) at sink/drain connection		
✓	**Faucet**	**Metric**	**Imperial**
	Discharge distance (min.)	**250 mm**	**10 in.**
	Faucet – distance between basin & water stream (min.)	**100 mm**	**4 in.**
	Blade handle length (min.)	**150 mm**	**6 in.**
	Blade handles cannot interfere with handwashing when in the open position		
	Faucets must be stationary; cannot swivel		
	Non-aerated, splash-free laminar flow devices		
	Hands free operable controls (e.g., electric eye, foot pedal) or faucet blades; provide means to control water temperature; electronic sensor must operate during power failure		
	Electronic sensor – must be sufficient clearance for handwashing without bumping faucet mouth		
✓	**Installation**		
	Wall mounted, no counter top		
	One meter clearance surrounding HHS		
	Backsplash – min. 600 mm (24 in.) above sink level & extending to floor coving. Include area under dispensers		
	Water pressure & flow rate – ensure removal of soap residue and minimize splashing		

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Version	Date (YYYY-MM-DD)
Created	2011-07-05
Updated	2019-17-19
Revised	2020-05-31

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2. CSA Z317.1-16 Special Requirements for Plumbing Installations in Health Care Facilities.
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4. AHS Infection Prevention and Control - Health Care Facility Design Recommendations and Preventive Measures for Construction, Renovation and Maintenance Activities, May 2013 (Updated March 2016).
5. AHS General Ergonomic Best Practices - Mounting Heights for Hand Hygiene Products and Sharps.
6. AB Safety Codes Council - Barrier-Free Design Guide, June 2017.

For more information contact
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Created	2011-07-05
Updated	2019-17-19
Revised	2020-05-31

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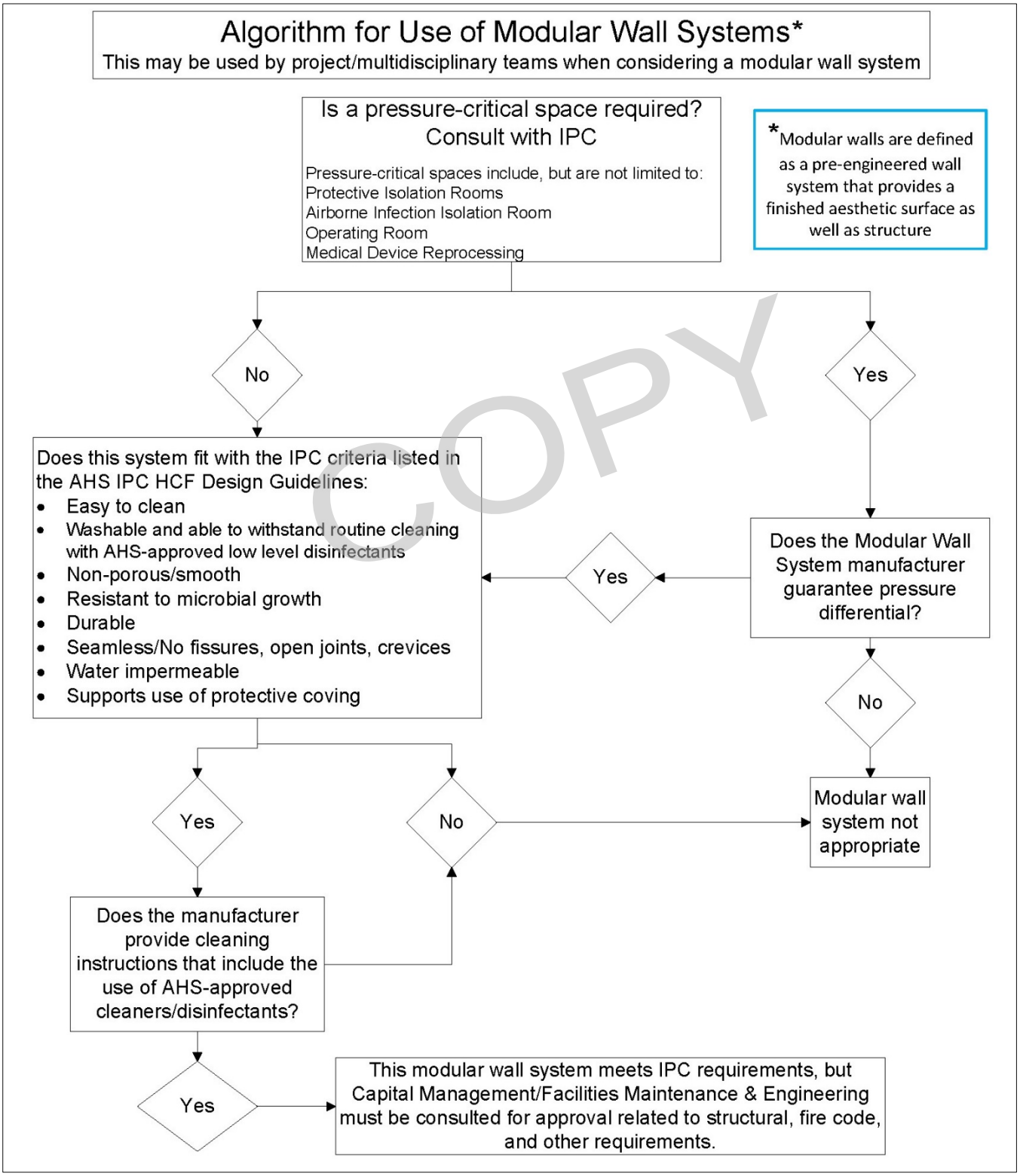
Appendix D: Modular Wall Use Algorithm



Appendix E: IPC Risk Assessment Matrix for Artworks

Infection Prevention and Control supports the art experience in healthcare facilities. A risk assessment should be conducted before art is chosen to ensure the materials and finishes are safe for the healthcare environment and the planned location of the artwork is appropriate. There must be a written plan for regular cleaning and maintenance.

Proposed installation space	**Environmental Services Risk Level**	**Art medium**		
		Easy to clean and disinfect	**Can be cleaned but not disinfected**	**Difficult to clean, damp dust only**
Administration and non-clinical offices	Low	✓	✓	✓
Public space (artwork is placed out of reach)	Low	✓	✓	Consult with FME and ES
Public space (artwork is placed within reach)	Low	✓	✓	Consult with IPC and ES
Clinical area	High	✓	Consult with IPC and ES	×
Point of care	Very High	Consult with IPC and ES	×	×

Key ✓ Does not require IPC, ES or FME approval X Not recommended

Assumptions:

- Tapestries and materials that promote growth of bacteria or fungi shall not be installed.
- Materials that require regular vacuuming should not be installed.
- Cleaning is done with soap and water. Disinfection involves the use of a low-level disinfectant (hospital grade germicide).
- Art that is visibly soiled and cannot be cleaned shall be removed.

Definitions:

- Public spaces are defined as spaces where patients rarely/sometimes spend time (e.g., executive offices, elevator foyers, food courts, front of house spaces, parking lots, and staff meeting rooms).
- Clinical areas are defined as spaces where patients usually/often spend time (e.g., clinic waiting rooms, nursing unit hallways, interview/consult rooms, physician offices where patients are seen, patient lounges and nourishment areas, nursing stations).
- Point of care spaces are defined as areas where patients receive examinations, diagnostics or treatment (e.g., in-patient rooms, clinic exam rooms, procedure rooms, diagnostic imaging rooms).

Note:

- For guidance on water features and open fish tanks, refer to section 2.12 Special Design Elements.
- Refer to Environmental Services “Cleaning Frequency Standard” Practice Support Document for more information on ES Risk Levels, Cleanable Surfaces, etc.

Glossary

Refer to the definitions section in the CSA Z8000. The definitions below are specific to these guidelines or are not found in the CSA Z8000.

Hand hygiene sink – a sink dedicated for the exclusive use of hand hygiene.

Hand washing station – a hand washing station includes a hand hygiene sink, soap dispenser, paper towel dispenser and waste receptacle.

Hands-free operation – includes elbow, knee, foot, or electronic operation.

Multidisciplinary team – a group comprising representatives from various disciplines in the healthcare facility that works with the project management team and others to ensure that the appropriate infection prevention and control measures are followed during construction activities. (CSA Z317.13-17).

Observation rooms –

> **Inpatient observation room:** defined as a multi-bed patient care area on an inpatient unit with an expected length of stay from 24 to 48 hours. The intended use is for observation and stabilization of patients on either step-up or step-down units requiring special care or extra observation. Each patient space in an observation room may be separated by a curtain, walls on three sides or a combination of both.
>
> **Outpatient observation room:** defined as a multi-bed patient care area in an emergency department or outpatient area with an expected length of stay up to 24 hours. The intended use is for observation, assessment and stabilization of patients needing special care or extra observation to evaluate a patient's condition to determine the need for admission. Each patient space in an observation room may be separated by a curtain, walls on three sides or a combination of both.
>
> **Step-up/step-down unit**: A unit with patients that either have been discharged from a Critical Care Unit or need a higher level of care than a general medical/surgical unit. (Also referred to as an Intermediate Care Unit.)

Abbreviations

ABHR – alcohol-based hand rub

AIR – airborne isolation room

CDC – U.S. Centers for Disease Control and Prevention

CSA – Canadian Standards Association

FGI – Facility Guidelines Institute

FME – Facility Maintenance and Engineering

HCF – healthcare facility

HHS – hand hygiene sink

HVAC – heating, ventilation, and air conditioning

IPC – Infection Prevention and Control

MERV – minimum efficiency reporting value

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