

Health Care Facility Design and Construction

Background

All health care facilities must promote and support an environment that is safe for patients/residents, visitors and health care workers. Planning for any renovation, demolition, or construction of health care facilities, room designs, surfaces and processes must take into account the Chain of Transmission to avoid spreading potentially harmful microorganisms. Infection prevention and control (IPAC) concepts must be incorporated into the planning and design to ensure safety for the patient/resident/client and staff.

Position Statement

The Role of Infection Prevention and Control Professionals

1. Infection Prevention and Control Professionals (ICPs) must be involved in all phases of health care facility design, construction and renovation. In addition to performing an Infection Control Risk Assessment^{1,2} the ICP's involvement includes, but is not limited to:
 - participation in proposal for funding
 - participation in design planning
 - participation in, and review of, tender documents and mockups
 - participation and inclusion in product/décor selection
 - participation and ongoing auditing during the construction phase
 - participation in multidisciplinary team meeting (MDT) throughout the project
 - participation during the commissioning phase
2. ICPs must be involved to ensure that all phases of a project facilitate the desired IPAC practices, and meets or exceeds current guidelines and best practices. This includes the Canadian Standards Association (CSA), The Facility Guidelines Institute (FGI), Public Health Agency of Canada, and ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers).
3. ICPs must review preventive measures and construction specifications to ensure adequate language and requirements are included in the tender documents prior to document issuance. The ICP must communicate to the MDT, and advises on the proper preventative measures¹ to be adhered to throughout the construction phase to decrease the risk of construction-related infections.

Infection Prevention and Control Design Details

The ICP is an integral member of the MDT and project design team for all projects and collaborates with the multidisciplinary team to assess risks associated with construction activities. In addition, the ICP approves the design phase of each project as it relates to IPAC requirements and activities, such as class of project, traffic patterns (people/supplies), HVAC /ventilation, hand hygiene facilities, patient care, composition of vertical/horizontal surfaces and finishes, water supply/plumbing, storage of equipment/ including PPE and the storage/disposal of infectious waste.

1. In-Patient Bedrooms

Single patient rooms have been shown to help decrease the risk of infection by reducing cross-contamination. *(The IPAC Canada Healthcare Facility Design and Construction Interest Group is in the process of developing practice recommendations on single in-patient bedrooms.)*

2. Hand Hygiene Sinks

Before installing hand hygiene sinks and hand hygiene product dispensers, a workflow pattern and risk assessment must be prepared to facilitate the decision on sink placement.⁶ Hand hygiene sinks must be accessible, convenient, and of appropriate design to encourage proper hand hygiene, and to decrease the potential of acting as an environmental reservoir for contaminants.⁷ *[IPAC Canada Healthcare Facility Design and Construction Interest Group is in the process of developing practice recommendations for hand hygiene sinks.]*

3. Paper Towel Dispensers

Towel dispenser design should be such that only the towel is touched during removal of towel for use.⁷

4. Automatic Hand Dryers

Hand dryers with forced air are not recommended in clinical areas, as these dryers allow aerosolization of pathogens.¹⁰

Automatic air hand dryers are acceptable in public bathrooms, non-clinical areas/offices, and assisted-living facilities. If automatic air dryers are installed and no paper towels are available, hands-free faucets should also be installed to avoid re-contaminating clean hands when turning faucets off.¹⁰

5. Human Waste Management

Management of human waste and bodily fluids should be incorporated into the planning and design phase to ensure they are utilized at, or close to, the point of care. There should be no manual cleaning or disinfection of reusable bedpans, urinals or commodes between patients. The use of spray wands should be eliminated. The number, location and type of these systems shall be determined based on the risk assessment and should be a decision made by the MDT.

6. Equipment, Furniture and Finishings

Selection and planning of equipment, furniture and finishings should be reviewed prior to procurement to ensure all materials are seamless and non-porous and are easily maintained, cleaned and disinfected. Selected materials must be compatible with hospital-grade disinfectants, and able to be maintained with the health care facility's relevant cleaning/disinfection/sterilization processes. All products and materials must have manufacturer instructions detailing the specific cleaning and disinfection process compatible with health care standards.

Stakeholders

IPAC professionals, engineering, maintenance, senior administration, provincial and federal stakeholders, policy makers, and others in health care organizations.

Participants in Development of Position Statement

This position statement was developed by the Healthcare Facility Design and Construction Interest Group.

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References

1. Canadian Standards Association. **CAN/CSA Z317.13-12. Infection Control during Construction, Renovation and Maintenance of Health Care Facilities**. Mississauga, Ont.: Canadian Standards Association; December 2012.
2. Canadian Standards Association. **CAN/CSA-Z8000-11. Canadian health care facilities**. Mississauga, Ont.: Canadian Standards Association; September 2011.
3. Ontario. Provincial Infectious Diseases Advisory Committee (PIDAC). **Best Practices for Environmental Cleaning for Prevention and Control of Infections in All Health Care Settings**. May 2012 [cited March 2016]; 1-183. Available from: http://www.publichealthontario.ca/en/eRepository/Best_Practices_Environmental_Cleaning_2012.pdf
4. Health Canada/Public Health Agency of Canada. **Infection Control Guidelines: Construction-related nosocomial infections in patients in health care facilities. Decreasing the risk of Aspergillus, Legionella and other infections**. Can Commun Dis Rep 2001;27 Suppl 2:1-46. Available from: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/01vol27/27s2/index.html>
5. Health Canada. **Fungal Contamination in Public Buildings: Health effects and investigation methods**. 2004 [cited March 2016]; 1-47. Available at: http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/air/fungal-fongique/fungal-fongique-eng.pdf

6. Canadian Construction Association. **Mould Guidelines for the Canadian Construction Industry.** CCA 82-2004:p. 14 (no. 6.5). 2004 [cited March 2016]; Available from: <http://www.cca-acc.com/documents/cca82/cca82.pdf>
7. Ontario. Provincial Infectious Diseases Advisory Committee (PIDAC). **Best Practices for Hand Hygiene in All Health Care Settings.** April 2014 [cited March 2016]; 1-84. Available from: <http://www.publichealthontario.ca/en/eRepository/2010-12%20BP%20Hand%20Hygiene.pdf>.
8. FGI Guidelines for Design and Construction. **2014 Guidelines for Design and Construction of Hospitals and Outpatient Facilities.** Facility Guidelines Institute, eds.; 2014. Available at: <http://www.fguidelines.org/guidelines/2014-hospital-outpatient/>.
9. Alberta Health Services/Covenant Health. **Infection Prevention and Control: Health Care Facility Design Guidelines and Preventive Measures for Construction, Renovation and Maintenance Activities.** May 2013 [cited March 2016]; Available at: http://extcontent.covenanthealth.ca/InfectionPreventionControl/Workplace_IPC_IPC_HCFDesignGuidelineandPreventiveMeasuresDuringConstructionRenovationandMaintenance_May2013.pdf.
10. Public Health Agency of Canada. **Hand Hygiene Practices in Healthcare Settings.** Ottawa 2012 [cited March 2016]; Available from: http://www.ipac-canada.org/pdf/2013_PHAC_Hand%20Hygiene-EN.pdf
11. Canadian Standards Association. CAN/CSA-Z317.1-09. **Special requirements for plumbing installations in health care facilities.** Mississauga, Ont.: Canadian Standards Association; 2009; R2015.

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