Smarter Infrastructure for Enhanced Patient Outcomes

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Upping the Game: How the new edition of CSA Z8000 is shaping health care design for the next decade

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Value of Standards

Standards play an important role in safety, security, the environment and the global economy, by fostering wider acceptance of emerging technologies and helping to manage risk.
Members drive Standards for Social Good

• +9,000 Engaged and Dedicated Volunteer Members

• +1,300 Standards Technical Committees
Standards & Codes drive Trust and Safety

Over 3,000 standards, codes & related products in 50+ technology areas

Construction and Infrastructure  
Electrical and Gas  
Healthcare  
Environment  
Public and Workplace Safety  
Petroleum and Natural Gas  
Power Generation and Delivery  
Business Excellence
CSA Standards Development Process

1. Request / Evaluation / Authorization
2. Assign to Committee
3. Notice of Intent
4. Meetings / Draft
5. Public Review
6. TC Reaches Consensus
7. Pre-approval Edit
8. Technical Content Approval
9. Procedural Approval
10. Final Edit / Publication
11. Dissemination
12. Maintenance
What was the need for Z8000?

Driven by a range of factors:

✓ Increases in Canadian capital spending on health care facilities
✓ Disappearance of dated provincial guidelines
✓ Lack of a commonly-accepted national standard
✓ Shortage of HCF planning and design experts in the country
✓ Public awareness of safety issues around health care-associated infections (HAIs), and pandemic preparedness
National Codes System
50+ Codes published since 1941
Health care facilities are classified as Group B, Division 2 buildings in the NBCC

Specific provisions include:

- Barrier free
- Electrical systems
- Exits
- Fire safety
- HVAC
- Post-disaster construction
- Radon measurement
- Self closing devices
- Sprinklers
The first edition of Z8000 accomplished two things:

✓ Codified Canadian and international best practice to create a common design reference for health care facilities; and

✓ Pushed the field to accept new ideas for healing environments that would improve patient outcomes.
Who needs the Standard?

- Architects
- Engineers
- Planning and project managers
- Contractors and builders
- Commissioning teams
- Functional programmers
- Facility managers
- Maintenance managers
- IPC professionals and other health care professionals
Research Study on Z8000 and the impact on HAIs (2017-2018)
Objective:
To investigate the effect of specific hospital design requirements (CSA Z8000-11) on preventing exposure to infectious disease acquired within the health care setting.

Methodology:
• Literature review on design elements and effect on HAI rates.
• Surveillance data on hand hygiene compliance and incidence of HAIs obtained from the Public Health Agency of Canada.
• Data on HAIs and hand hygiene rates measured before/after renovation or move to a newly constructed building was collected through questionnaire sent to 9 hospital sites.
Study Size
✓ 7 hospital sites provided data

3 Design Features Examined
a) Patient separation via single-patient rooms
b) Dedicated human waste disposal
c) Hand hygiene sink/ ABHR location and distribution

Infection Prevention Indicators Assessed
a) HAI quarterly rates (# cases/1000 pt days) for:
   ▪ MRSA infection rates
   ▪ C. Difficile infection (CDI) rates
b) Hand hygiene compliance before care.
Results from CSA Research on Z8000

- Increase from 22% to 80% private rooms
- On average a modest 4% increase in hand hygiene compliance rates*
- Average **54.6% reduction** in new C. Difficile infection rates
- Average **49.6% reduction** in new MRSA infection rates
Results from CSA Research on Z8000

- Average 54.6% reduction in new C. Difficile infection rates
- Average 49.6% reduction in new MRSA infection rates

So did CSA Z8000-11 make a difference?

- Single patient rooms encountered much resistance due to the increased capital cost to build and operate, but are now increasingly accepted that they save hospitals money with their “internal rate of return.”

- The study showed the importance of a HCF’s design in supporting good practices in patient management and control of infection, hand hygiene compliance, and proper human waste disposal.
The Evolution of CSA Z8000-18

416 pages

573 pages
Development Timeline

First edition of Z8000
published September 2011

Committee begins work on new edition
October 2014 – March 2017

Public Review
April to June 2017

~ 600 Public Review comments resolved
June to August 2017

Ballot completed via TC recorded vote
May 2018

Second edition of Z8000-18
published July 2018
• Technical Subcommittee with 29 members
• Took over 2 years to develop
• Countless experts consulted during the process
• Goal of still designing and constructing a physical environment for better patient care to happen, and facilitate better outcomes
20 Working Groups

- Scope
- Long term care
- Ambulatory care
- Pediatrics
- Planning
- IPC
- OHS/ patient safety/ accessibility
- Procedures
- Architectural
- Document structure

- Technology
- Wayfinding
- Room sizes
- Single patient room
- OASIS
- Mock ups
- MDRD
- Catastrophic events
- Risk assessment
- Medical/ clinical laboratories
New and Improved!

✓ New and updated requirements reflecting technological advances, changes to service delivery models, and current trends and needs in health care.

✓ Better aligns with P/T planning and procurement processes.

✓ Improved readability and flow.

Results from CSA Research on Z8000

- Average 54.6% reduction in new C. Difficile infection rates
- Average 49.6% reduction in new MRSA infection rates

Layout of CSA Z8000-18

- Introduction
- Principles
- Planning
- The Site
- General Areas
- Inpatient Areas
- D&T Spaces
- Support Areas

Common Requirements

Building Services
What stayed the same?

The Patient Room (Single Bedded Room)

• Family support shall be recognized
• Shall have natural light
• Windows shall allow for an exterior view or view to the outdoors
• Patients should have control of lighting
What stayed the same?

For an inpatient room with more than one bed:

One bum = One toilet
How will CSA Z8000-18 shape health care design for the next decade?
NEW

Definitions

• **Ambulatory care**: a mode of delivering health care services as day treatment, on scheduled or unscheduled outpatient basis, and, not requiring admission to an inpatient bed/overnight hospitalization.

  **Note**: Although ambulatory care services are delivered as day/outpatient treatment, additional follow-up visits and treatment can be needed.

• **Class C-1 and Class C-2 added to definition of HCF**
  
  • **Class C-1 HCF**: elective surgical or diagnostic procedures are performed that could temporarily render a patient **incapable** of self-preservation, or where a service interruption could otherwise endanger patients
  
  • **Class C-2 HCF**: provides surgical or diagnostic procedures on an outpatient or occasional basis, in which patients remain **capable** of self-preservation.
• Introduction of interdisciplinary design team (IDT)
• Requirements for pediatric operating rooms
• Requirements for long-term care facilities
• Table 8.9 – Key space requirements and recommendations for long-term/personal care
• Heavily revised catastrophic events management section
• Many updates to Table 11.1
Introduction of a risk categorization system ambulatory care services

• **Category I:** Services that are lower risk to patients (non-invasive diagnostic procedures, specimen collection, minor surgery for “lumps and bumps”).
  
  **Clause 9.2 and Table 9.1**

• **Category II:** Longer-term and more invasive procedures (dialysis, conscious sedation, infusion treatments).
  
  **Clauses 9.1 and 9.3, and parts of Clauses 9.4 – 9.13**

• **Category III:** Highest risk services (general anesthetic, medically supervised recovery).
  
  **Clauses 9.1 and 9.3, and Clauses 9.4 – 9.13**
Major Changes

- Global changes throughout to address IPC concerns
- Requirement for at least one airborne isolation room to be located in the emergency department (Class A HCFs)
- Requirements for areas, clearances, and accessibility for unique patient populations – pediatrics, bariatrics, and residents in long-term care
- Expansion on complex care requirements to reflect the complex, chronic medical conditions of patients
Clause 4– General Planning and Design

Objective Based Principles:

O perations
A ccessibility
S afety and Security
I nfection Prevention and Control
S ustainability
Clause 5 – Project Planning and Design

• Initial planning*

• Master program*

• Design* (mock ups)

• Construction

• Commissioning

• Occupancy

• Post-occupancy evaluation (POE) shall be done

• Role of IDT in the project planning process and throughout the project – reviewing the overall system-wide service plan, establishing the HCF classification*
Clause 6 – Site and Facility Development

• Site requirements* – entry points, circulation, ambulance bay

• Facility requirements
  • Communication incoming services*
  • Building form and function
  • Wayfinding*

• Key relationships and dependencies with updates to almost all of the 30 Tables
Clause 7 – General Functional Service Requirements

• Materials and finishes* – seamless, monolithic, integral coved base

• FFE* – acoustics, vibration of equipment

• Infection prevention and control*
  ➢ Patient separation – single bedded with washrooms, multi-patient treatment spaces.
  ➢ Waiting areas and holding room clearances.
  ➢ AIRs – at least one in the emergency department, each shall have an anteroom.
  ➢ Protective environment rooms shall be equipped with an anteroom.
  ➢ Separate enclosed washroom for human waste management
  ➢ Hand hygiene facilities – ratio of HHS to patients (1:1, 1:2, 1:3)
Clause 7 – General Functional Service Requirements

- Occupational health and safety*
  - Hazard assessment, mitigation of risks, crawl spaces, ergonomics
  - Elements to enhance safety and security, patient transfer plan

- Emergency management*
  - Site access, building access and circulation, accessibility

- Facility planning*
  - Amenity spaces for pediatric settings
  - Accommodation of bariatric persons

- Catastrophic event management*
  - Risk assessment, protocols, management plans, contingency planning, operational continuance.
Clause 8 – Inpatient and Related Services

- Medical/surgical inpatient
- Critical care
- Maternal and newborn*
  - Infant nutrition preparation room
- Mental health and addictions*
  - Additional requirements including risk assessment for HHS and ABHR installations, mirrors, door assemblies, shelves, hooks
- Pediatric and adolescent*
  - Amenity space and accessibility considerations, pediatric units, security (VSS, secured access points), wireless capabilities
Clause 8 – Inpatient and Related Services

• Pediatric and adolescent rehabilitation care*
  • Pediatric outpatient rehabilitation services, space and accessibility requirements, education of family, multi-use therapy rooms

• Complex care
  • Program of services for people with complex conditions requiring specialized care, enhanced long term care, or restorative care

• Long-term care** (new Table 8.9)
  • Positive environment promoting resident care, additional services (palliative, alternative care, behavioral support, respite care), resident functional requirements, IPC, FFE, safety and security
Clause 9 – Diagnostic and Treatment Functional Services

- Diagnostic and treatment services*
- Ambulatory care facilities (Cat I and II)**
- Procedures**
  - Pediatric operating rooms (Cat III)
  - Operative procedure rooms (Cat III) – New Table 9.2
- Ambulatory care – Dialysis
- Oncology services*
- Endoscopy services**
  - Planning, design, workflow, MDRD, telehealth, IPC
 Clause 9 – Diagnostic and Treatment Functional Services

• Emergency care*
  • Physical barriers in triage, patient segregation, secure/observation room

• Clinical Laboratory*
  • Containment areas, anterooms and vestibules, clothing change and hand hygiene at exits

• Pharmacy*
  • Laminar flow hoods, refrigerators/freezers, HHS
Clause 10 – Support Functional Services

- Biomedical engineering
- Environmental services
- Nutrition and food services
- Materials management
- Plant maintenance
- Security and parking
- Medical device reprocessing department*
Table 11.1 – (49 pages long)

Detail added to the following Items:

- 4 – Lockers
- 16 – Examination treatment – adjacent washroom
- 19 – Hand hygiene sink
- 24a – Inpatient bedroom
- 26 – Isolation room suite, private AIR
- 32 – Nourishment centre
- 43 – Staff room
- 47 – Waiting area/rooms (bariatric)
- 48 – Washroom (public)

New sections added:

- 14b – Procedure room, minor procedures
- 14c – Examination/procedure/treatment bariatric
- 24b – Inpatient bedroom bariatric
- 25b – Inpatient washroom bariatric
- 30 – Lounge, patient/visitor
Clause 12 – Building Services and Environmental Design

• Architectural systems*
  • No pocket doors!
  • Operable windows not preferred
  • Flooring and ceilings (monolithic, integral coved base at walls, seamless, tightly sealed)

• Electrical systems*
  • Wiring methods and cabling

• Information technology*
  • Wireless systems, telecommunication rooms

• Security systems*
  • Compatible throughout facility, video surveillance systems
Annex D – Informative

Key space requirements and recommendations for special – purpose spaces and rooms

- Demonstration kitchen
- Cultural spaces
- Sweetgrass ceremonies
- Traditional healing medication/herb room/space
- Meditative space
Implementation and Impact
Implementation Considerations

• Building upon the wide-referencing of the 2011 edition, the updated 2018 edition is a collection of national recommendations and best practices in one document, that is expected to further enhance national and provincial planning, design and implantation of new and renovated HCFs.

• Format parallels national and provincial building codes, making it easy to follow the mandatory (shall) and recommended (should) requirements and guidance.
Implementation Considerations

• Although not yet referenced as regulation in building codes, it is an nationally accepted document for the design and construction of Canadian health care facilities.

• The requirements and guidance are adaptable to any size of health care facility in many locations across Canada.

• Acts as a common reference point for other CSA standards (CSA Z317.1, CAN/CSA-Z317.2, CAN/CSA-Z317.14, CAN/CSA-Z80001, CSA Z8002) and this family of health care engineering and physical plant standards work together to a common goal of improving care delivery in these buildings, and better patient outcomes.
Please advise CSA of any errors or requirements that conflict with your provincial guidelines so that they can be addressed.
Where to purchase CSA Z8000-18?

CSA Z8000-18 can be purchased at store.csagroup.org

➢ Type “Z8000” in the Search field
Access via CHES

Log in to CHES using your username and password

- Click on Member Tools → CSA Standards
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