CSA Z8000: Is it Making a Difference?

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CSA Group

• Membership-based organization: Over 9,000 experts
• Sectors:

<table>
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<tr>
<th>Health and Safety</th>
<th>Electrical &amp; Gas</th>
<th>Petroleum &amp; Natural Gas</th>
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<tr>
<td>Environment &amp; Business Excellence</td>
<td>Construction &amp; Infrastructure</td>
<td>Power Generation &amp; Delivery</td>
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• Health & Safety:
  – Worker and Public Safety Program
  – Health Care Program is made up of 12 Technical Committees (TCs)
    • 580 expert members serve on Healthcare committees
Health Care

- Health care facilities
- Medical device reprocessing
- Blood & blood components
- Cells/tissues/organs for transplantation
- Assisted reproduction
- Medical laboratories
- Perioperative safety

Public and Worker Safety

- Community Paramedicine
- Medical devices (e.g., quality/risk management)
- Electricity in health care
- Kidney dialysis (incl. Home Dialysis)
- Child-resistant packaging

Other

- Psychological health and safety
- Occupational health and safety
- Emergency management
- First responders (e.g., PPE)
- Human Factors
- Accessibility
- Aging/seniors
- Injury prevention

- Nanotechnology
- Management systems (e.g. quality management, whistle blowing, social responsibility)
- Sustainability
- Energy efficiency
- Information Communication Technologies
- Canada’s North
Standards in Health Care
• Currently maintains over 220 standards* in the following key subject areas:
  – Health care facilities
    • Z8000 Canadian Health Care Facilities
    • Z8001 Commissioning of Health Care Facilities
    • Z8002 Operation and Maintenance of Health Care Facilities
    • Z317.1 Special Requirements for plumbing installations in health care facilities
    • Z317.14 Wayfinding for Health Care Facilities
  – Medical devices
    • Z314 standards on medical device reprocessing
  – Blood and transplantation management
    • Z902 Blood and blood components

*Portfolio includes of ISO-adopted standards and “home-grown” standards.
Z8000-11
Canadian Health Care Facilities
The Cost of Healthcare in Canada

Source
National Health Expenditure Database, Canadian Institute for Health Information.
Capital Spending on HCF

Tot. inv. med. facilities, Million US$ at exchange rate Canada

OECD Health Data 2009

Years

Driving Factors for a Standard

- Capital spending on HCF
- No Canadian National standard
- Old provincial guidelines have disappeared
- Evidence based design
- Shortage of planning/design skills
- Public awareness of safety
- Pandemic fears
- Increasing technology integration
- HCF definition blurring
Environmental Measures to achieve EBD macro-objectives

• **OBJECTIVE 1: IMPROVING PATIENT SAFETY**
  – 1.1 Reducing Hospital-Acquired Infections
  – 1.2 Reducing Medical Errors

• **OBJECTIVE 2: IMPROVING PATIENT OUTCOMES**
  – 2.1 Reducing Pain
  – 2.2 Improving Patients’ Sleep
  – 2.3 Reducing Patient Stress
  – 2.4 Reducing Depression
  – 2.5 Reducing Spatial Disorientation
  – 2.6 Improving Patient Privacy and Confidentiality
  – 2.7 Fostering Social Support

• **OBJECTIVE 3: IMPROVING STAFF OUTCOMES**
  – 3.1 Decreasing Staff Stress
  – 3.2 Increasing Staff Effectiveness
Top 10 EBD Features to improve outcomes

• Single-bed patient rooms
• Access to nature
• Access to daylight and sunlight
• HEPA filters
• Sound-absorbing ceiling tiles
• Ceiling lifts
• Visible and accessible hand washing sinks and dispensers
• Decentralized nursing stations
• Family areas within patient care spaces
• Staff respite space
Driving Factors

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Hospitals face hand-washing crackdown

Amid growing concern over spread of infection, watchdog demands hygiene audits and compliance plans from acute-care facilities

By CAROLINE 

Canadian hospitals seeking accreditation will soon be required to audit whether their doctors and nurses are washing their hands — and are expected to do something about it if they are not.

Beginning next January, Accreditation Canada will compel virtually all acute-care hospitals — in addition to those nursing homes and other facilities seeking stamps of approval to not only do hand-hygiene audits but to have a plan to maintain or improve hand-washing compliance.

Not even hospital volunteers will be exempt. They and hospital staff will be trained on how to properly wash their hands and to know when it is required.

"Wash your hands is a very important step in the prevention and/or control of spread of infection," said Wendy Nictita, president and chief executive officer of Accreditation Canada, formerly known as the Canadian Council on Health Services Accreditation, a non-profit, independent organization.

"We’re at the point where we can’t afford not to do it.

No wonder: With only 40 per cent of health-care providers in Canada properly washing their hands, experts say infections are on the rise.

An estimated 100,000 people develop hospital-acquired infections in Canada each year, at least 8,000 patients are killed by them, roughly the same number as those who die from car accidents and breast cancer combined. And yet, half of all infections could be prevented.

Although accreditation is a voluntary process, 90 per cent of Canada’s acute-care hospitals participate in it, as do many nursing homes, some community health centres, home-care organizations and other health-care facilities. Accreditation Canada accredits 1,100 acute-care facilities in this country.
Driving Factors

- Capital spending on HCF
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The New Clinic

Get well. Stay well.

The Clinic at Walmart offers your family walk-in convenience to affordable, quality care.

Find a Clinic

(PDF 3.35Kb)
CSA Group supports and conducts research in new and emerging areas of interest, as well as other topics and issues with the potential to impact the world around us.

http://www.csagroup.org/research
Project subcontracted to University of Ottawa

Established a correlation between a measurable variable (rotational acceleration) and resulting maximum strain in the brain. Strain is known to be related to concussion.

Results are being considered by CSA Technical Committee to determine how to integrate into the standards.
Macro Research Projects

➢ Sharing Economy
  ▪ Recommendations for standard-based solutions
  ▪ Framework for a principle-based standard
  ▪ ISO international workshop
  ▪ ISO document to be issued during Fall 2017

➢ Canada’s North
  ▪ Twelve topics – indigenous people engagement, water, emergency responses, health, infrastructures, etc
  ▪ Recommended standards and research topics
Current Macro Research Projects

- Active Assisted Living (partnering with University of Waterloo)
- Indigenous Engagement Model (partnering with BCIT)
- Safety in Hospitals (partnering with UHN)
- Sharing Economy Phase 2 (partnering with Mowat Center)
- North Phase 2 – In development
  - Water Treatment
  - Paramedicine
- Hospital Acquired Infection
# Research project: Health care facility design and infection prevention

- **Purpose:** investigate the impact of hospital design requirements found in CSA Z8000 *Canadian Health Care Facilities* on preventing exposure to infectious diseases.

## Challenges

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<th>Approach</th>
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<td>Complexity of HCF environment and multiple contributors to HAIs (e.g., patient status, evolving IPAC practices)</td>
<td>Not a correlational study, but to look for any measurable improvements after moving to a newly designed or renovated HCF, which has incorporated key design elements found in Z8000.</td>
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<td>Timing of new builds/renovation construction projects to collect meaningful “before” and “after” data in relation to Z8000 (published in 2011).</td>
<td>Z8000 was not available during the design phase of participating HCFs, but some of the requirements and design features implemented were the same and therefore could be considered.</td>
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OASIS – OPERATIONS

- Environment of Care for the Patient
  - promotes healing, wellness
  - sensitive to needs of individuals

- Clinical Functionality
  - effective delivery of care
  - effective application of equipment
  - efficiency of operations

- Support Services to facilitate the Environment of Care and Clinical Functionality
• minimize barriers, consideration of disabilities
• effective and appropriate wayfinding
• minimize patient travel
• staff workflow
• provision of supplies
• wait times
• provision for family support
• patient and patient information communication
• errors in delivery of care
• environmental hazards
• equipment hazards
• criminal activity
• privacy and dignity
• emergency conditions
• preventing transmission of pathogens between people
• preventing the creation and propagation of environmental irritants
• waste management
• application and handling of supplies, instruments and equipment
• caregiver and patient hygiene
• promote patient, staff and occupant wellness
• socially responsible impact on the environment (green)
• flexibility to accommodate future change
• appropriate for needs of the community and patient population
• total cost of operation
CSA Z8000 Health Care Facilities

• Comprehensive standard for planning, design and construction of Health Care Facilities (others referenced)

• 1st edition published 2011
  – Planning Guidance
  – Evaluation
  – Program Adjacencies
  – Rooms sizes
  – Clearances
  – Storage Space
  – Acoustics / Light
  – Patient Lifts
  – Sustainability / Flexibility
  – Catastrophic Event Planning
  – Single Patient Rooms
  – Hand Hygiene Sinks
4.5.3 Inpatient bedrooms

4.5.3.1 All inpatient bedrooms in Class A HCFs shall be single bedded rooms unless the functional program demonstrates the necessity of a two-bed arrangement.

Justification for two-bedded or multi-bed inpatient bedroom accommodation shall include supporting documentation validating the clinical significance of this arrangement. In this arrangement, there shall be one washroom per patient.

27.0 m$^2$ net per single room (including 3 pc washroom)
51.6 m$^2$ net per double room (including two 3 pc washrooms)
7.5.2.2 Single inpatient bedrooms
All inpatient bedrooms in Class A HCFs shall be single bedded rooms unless the functional program demonstrates the necessity of a two-bed arrangement.

Justification for two-bedded patient bedroom accommodation shall include supporting documentation validating the clinical significance of this arrangement. See Clause 4.5.2.

7.5.2.3 Multi-patient bedrooms
A multi-patient bedroom shall accommodate no more than two patients. In this arrangement, there shall be one washroom per patient.
Hand Hygiene

• More ABHR Locations
• More Sinks
• New Sink Design!
Hand Hygiene Sinks

• **Size**
  – Prevent splashing during use
  – Inside: 350 x 250 mm; Minimum depth: 225 mm

• **Spout to be offset from drain**

• **At least 1 m from work surfaces**

• **Faucets to be hands free**
  – Electric eye, foot pedal, faucet blades

• **Stations include**
  – Single use paper towel dispensers
  – No cloth drying towels allowed
  – No hot-air dryer allowed

Table 11.1 #19
Research project overview (what we did)

- Existing information/resources:
  - Literature review
  - Review of HAI and hand hygiene surveillance in Canada
    - Federal (CNISP) and Provincial programs in place

- HCF Survey:
  - Develop a survey to collect “before” and “after” comparison data
  - Conduct interviews with IPAC and facility planning staff

- Analysis and final report:
  - Determine any statistically significant change in HAI or Hand Hygiene rates
HCF Survey (what we looked at)

• HAI and hand hygiene rates:
  – Health care associated infection (HAI) quarterly rates
    (# cases/10,000 patient days):
    • Methicillin-resistant *Staphylococcus aureus* (MRSA)
    • *Clostridium difficile* infection (CDI)

• Hand hygiene compliance:
  – Percent compliance
Hospital key design elements:

- Patient separation (e.g., single patient rooms vs. multi-bedded rooms)
- Ratio of patient rooms to patient washrooms
- Hand hygiene sink design and distribution
- Human waste disposal (equipment/technology and location)
Survey Overview:

• **Section A: General Hospital Information.** Number of hospital beds, private rooms vs multi-bedded rooms, airborne isolation rooms (AIRs), and AIR anterooms. Ratio of washrooms to patients.

• **Section B: Hand hygiene sinks and waterless hygiene stations/ABHR (alcohol-based hand rubs).** How hand hygiene audits are collected, hand hygiene rates, sink type/dimensions, quantity and distribution of sinks/stations, and other observations made in relation to hand hygiene that the participant considered relevant (e.g., any change in policy/practice).

• **Section C: Human waste management.** Descriptions of the type and location of equipment used to manage human waste (e.g., washer disinfectors, macerators).

• **Section D: Healthcare associated infections (HAIs).** Collection of HAI rates for CDI and MRSA. Participants were also asked to describe any other changes that may have had an impact on HAI rates during the timeframe under review.

• **Section E: General questions.** Participants were asked to identify any other major changes (before/after) that may have had an impact on HAI rates at their HCF.
Private Rooms:

Percent Private Rooms

Before: 22%  
After: 80%
Hand Hygiene: Compliance Rates

On average a modest 4% increase in hand hygiene compliance rates

- Challenge in obtaining “before” data (paper-based)
- Compliance measured using different methods
Human waste management

• Variation in technologies used and their placement
  – New builds incorporated washer disinfectors and/or macerators.
    • Old buildings: none were placed at the point of care
    • New buildings: either at point of care of a combination (central and at POC)
  – Some older systems (e.g., Hygie bags, disposable bedpans) were also still in use.
Survey Results: Infection Rates

• *Clostridium difficile* infection
  
  Average decrease **54.6%**

• Methicillin-resistant *Staphylococcus aureus* (MRSA)
  
  Average decrease **49.6%**
Z8000: Is it Making a Difference?

• Challenge to demonstrate (complex environment, multiple contributing factors)

• Preliminary study results ….
  
  Some good news…..
  – No increase in HAI rates (CDI, MRSA)
  – No decrease in hand hygiene, percent compliance (small improvements)
  – There has been some statistically significant decrease in HAI rates for CDI and MRSA
• 2nd edition
  – Planning requirements
  – Long term care facilities
  – Ambulatory facilities
  – Pediatric specific needs
  – Adjusted room sizes
  – Infection prevention & control measures
  – Risk management & catastrophic event planning
  – Wayfinding to reflect new Z317.14
  – Mock-up developments
  – Technology integration

2018
Concluding Remarks

• New CSA Group research program

• Preliminary results of study on effectiveness of CSA Z8000 Standards are positive

• 2018 edition of the Standard will be enhanced

THANK YOU !