Richard Dixon

- Vice Chair Infection Control Committee Z317.13-12
- Member HCF Planning Design Construction Z8000-11
- Member Operations & Maintenance Z8002-14
- Member Plumbing Z319.1-09
- Chair Wayfinding Committee
- Member National Regulators Forum
- Member Technical – All healthcare standards

New
CSA History

- Founded 1919 - Canadian Engineering Standards Association
- Library +3,000 standards & codes
- Product safety and performance, process improvement, best practices and safer work environments
- Accredited in Canada by Standards Council of Canada and in the U.S. by the American National Standards Institute (ANSI)
- +9,000 members
And yes, CSA does sports related head protection
Why We Need Standards

- Safer homes, workplaces and public spaces
- Sustainability and environmental
- New technologies and best practices
- Enhance trade national & international
- Make industry more competitive in the global marketplace
- **Standards help advance today, while anticipating tomorrow**
Standards in Our Daily Life?
Correcting the mistakes of the past

MRSA surgical-site infections can add substantial per-patient hospital costs

December 2009

Postoperative infections due to methicillin-resistant Staphylococcus aureus (MRSA) increase hospital readmission rates and death and can add $200,000 to per-patient hospital costs, according to a study from Duke University Medical Center.

“We conducted a multicenter study of multiple surgical procedure types among 260 patients to determine clinical and economic outcomes of postoperative infection,” said Dr. M. Michael Drummond, director of the Duke Center for Healthcare Quality and Outcomes Research and lead author of the research. “We found the impact of methicillin-resistant or surgical patients is substantial due to surgical site infection due to MRSA can potentially save hospitals as much as $200,000 per patient.”

The study, published in JAMA, is the first to provide cost-impact data on MRSA in a large hospital group. It compared hospital readmission, mortality, length of hospital stay, and MRSA patients with or without MRSA infection. The study was conducted during a 3-year period at six hospitals and one surgery center.

Legionella: a factor in health

Legionnaires' disease blamed on legionnaires' disease in Ontario

The disease is blamed on legionnaires' disease in Ontario, raising the number of deaths to 187. According to officials, one 89-year-old woman died from the disease in hospital.

Death traps

Eight thousand Canadians die of hospital-acquired infections each year. One simple change could save half of them. Why aren't we doing it? By Nicholas Köhler

Canadian hospitals underestimate the threat of hospital-acquired infections. Medical experts estimate that one in five patients who contract an infection during hospitalization die. Simple interventions can reduce the risk of these infections.
Who Else Has Standards?
How CSA Standards Are Developed

- **Preliminary stage**
  Evaluate applications

- **Proposal stage**
  Approval and assign project to a technical committee.

- **Preparatory stage**
  Working draft of the proposal and a schedule
How CSA Standards Are Developed

- **Committee stage**
  Develops a detailed draft using a consensus process.

- **Inquiry stage**
  Draft standard out for public review and comment.
Approval stage
Technical committee approves technical content of the draft
Additional review to verify that all procedures were followed throughout the development process.

Publication stage
Final edit to verify conformity with our numerous editorial and procedural requirements.
The standard is published!!!
Maintenance stage
Continually maintained to ensure they stay current and technically valid
Periodically publish amendments and/or interpretation of clauses.
Systematic reviews no less than every five years
Did You Know??

- Standards are developed by Canadians with specific knowledge, skills and experience in the relevant topic area
- Majority of meetings are teleconferences, webinars and local meetings
- Committee members are Volunteers!!!
Infection control during construction, renovation, and maintenance of health care facilities
CSA Z317.13-12

- Revised 2007 @ 40 pages to 2012 @ 108 pages
- Major contribution from IPAC, Contractors and CHES
- We used to push contractors to do a better job with infection control, now they push CSA to make it even better
- **Healthy building = healthy patients**
6.6.4.2 Operation, preventive maintenance, and storage of CAHUs

- Preventive Measure III or IV construction activity, CAHUs shall be leak-tested and their performance verified
- Performance has been verified within the last 12 months
- Performance leak tested
  a) IEST-RP-CC034.3;
  b) NSF/ANSI 49-2008; or
  c) ISO 14644-2.
Section 8: New Construction

Category 1—New location
Category 2—Existing detached location
Category 3—Existing connected location

Phase 1 — Excavation, foundation, envelope, and floors;
Phase 2 — Walls and ceilings;
Phase 3 — Interior finishing;
Phase 4 — Final finishing; and
Phase 5 — Completion and follow-up activities
CSA Z317.13-12

- Most popular of all CSA standards in sales and training sessions
- Requirement for your project → IC plan!!!
- Four instructors teaching in English and three in French
- “Do this standard right and you will save the lives of patients” ….. Major Canadian contractor
Commissioning of health care facilities
Z8001-13 Commissioning

- Based on Z320 - Building Commissioning Standard and Check Sheets
- Replaces the former Z318 commissioning standard
- Reflects the OASIS principle – Operations, Accessibility, Safety/Security, Infection Prevention & Control, and Sustainability
- Utilizes a ‘phased in approach’ – starting with the pre-design phase
- Includes architectural, transportation, fire suppression, plumbing, HVAC, control, integration, electrical, and communication
Electronic Checksheet Application

- Provides access to checksheet templates in Microsoft® Excel that can be updated, completed, saved locally, and printed.
- Sold as a single-user access (multi-license available)
- Checksheet templates are available for all major building systems including Mechanical, Electrical, and Control Systems and Integration
Z8002-14 Operations and Maintenance

- Buildings and architectural systems
- On-site access routes
- On-site utilities
- Mechanical, electrical, and information technology security systems
- Life safety systems
- Airborne isolation rooms, operating rooms, and specialized medical procedure rooms
- Permanently installed equipment
- Building services and interfaces for installed equipment, both medical and non-medical
- Demand & preventative maintenance
Z8002-14 Operations and Maintenance

- During 60 day review period in 2013, CSA received +300 comments --- mostly from CHES

Post Conference Training
Accessible design for the built environment
B651-12 Accessibility

• Technical requirements for making buildings and other facilities accessible to persons with a range of physical, sensory or cognitive disabilities, and was developed to fulfill an expressed need for a national technical standard that covers many different types of buildings and environmental facilities.
B651-12 Accessibility

- Tactile walking surface indicators, standard and universal washrooms, and residential accommodation issues
- References for accessible outdoor recreational environments
- Relevant to every healthcare facility
Z317.11-02 Area Measurement for Health Care Facilities
(Reaffirmed 2007)
Z317.11-02 Area Measurement

- Being resuscitated and updated
- Template information on generic names, common names
- Refinements of area, component and gross measurements
- Difference between crawl space, interstitial space between occupied floors, service space above ceiling on scaffold
Z317.11-02 Area Measurement

- Standard reporting format for all stakeholders
- Documenting differences in other methodologies of measurement (i.e. B.O.M.A.) in commercial building for inclusion of a healthcare program
- What is above the line – regular healthcare depts.
- What is below the line – retail, non traditional programs
- Useful for performance measurement & benchmarking
  - Maintenance
  - Energy Use and Operational Efficiency
  - Clinical Outcomes
  - Regulatory Comparisons
Z317.10—9 Waste Handling
Z317.10—9 Waste Handling

- Better name “Handling of Health Care Waste”?
- Types
  - Laboratory
  - Anatomical & cytotoxic drug waste
  - Veterinary waste
  - Dental waste
  - Any more?????
Z317.10—9 Waste Handling

- Other non-acute health care
  - Mobile clinics
  - EMS
  - Home Care
  - Commercial Buildings
  - Malls
  - Etc.
Medical gas pipeline systems — Part 1: Pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems
Z7396.1-12 Medical Gas Pipeline Systems

- Oxygen Concentrators
- Plume Scavenging
- New Annex for supply system & pipeline sizing
- What is a Qualified Manufacturer?
- What is a Qualified Service Technician?
- Annex A - Practical Applications
- Annex H – Suggested Protocols
Z7396.1-12 Medical Gas Pipeline Systems

- Maintenance audit on inspection checklists
- Operator training, qualification and license
- Alternate solutions based on risk analysis
- Enhanced policies and procedures
Z314.0-13 Medical Device Reprocessing

Medical device reprocessing — General requirements
Z314.0-13 Medical Device Reprocessing

- Medical Device Reprocessing Departments (MDRD) are responsible for decontaminating, inspecting, maintaining, disinfecting and sterilizing each medical device using manufacturer-validated methods.
- Establishes a quality management system
- **Annex A Micro-organisms and Infection**
  - Infections and disease
  - Chain of infections
  - 8 well written pages
• Requirements for evaluation and purchase of reusable medical devices and reprocessing equipment
• Best practices for personnel training and occupational health and safety
• Requirements for proper work areas and design
• Reprocessing principles, process verification, recalls and storage requirements
Getting ready for lift off
Z10535 Maintenance Requirements for Patient Lifts in Health Care Facilities

- Adoption of an international standard - *Hoists for the transfer of disabled persons, Requirements and test methods*.
- Mostly for manufacturers, and tells them what information need to include
- Published soon!!!
Z10535 Maintenance Requirements for Patient Lifts in Health care Facilities

• One of the Annexes to this standard contains maintenance guidelines for them to use when writing their instructions. Annex = Not mandatory

• Now working on developing a companion document to Z10535.2 that would be for users, and would include requirements and guidance for purchasing, use, and maintenance of patient lifts.
C22.1-12 Electrical Code

- Code applies to all buildings & healthcare facilities
- Contains over 180 updates and revisions
- New and extensively updated sections:
  - emerging technologies
  - renewable energy sources including solar & wind
  - new requirements for electric vehicle charging
Z32-09 Electrical Safety & Essential Electrical Systems
• New Edition 2015
  – UPS Systems
    • IT vs Medical
  – Power utility supply redundancy
  – ISO & IEC Standard interaction
  – Isolated power systems
  – Wet procedures
  – Voltage Drop Test – grounded systems
  – Leakage Current Tests
    • 250uA to 600uA
Special requirements for heating, ventilation, and air-conditioning (HVAC) systems in health care facilities
CSA Z317.2-10

- Public review August 2014??
- HCF Classification
  - Class A,B,C (world is more than hospitals!!!!!)
- Revision to Catastrophic Event Mgt.
  - Looking at cross system impacts
  - Prepare for the eventual
**CSA Z317.2-10**

- CHES membership on College Physicians & Surgeons – BC on office building based procedure room HVAC compliance
- Lots of impacts to Class C facilities “procedure rooms” in office and commercial buildings
- Redundancy interpretations
- HVAC & UV-C (bacteria & viruses) ??
- Air flow: Corridor -> patient room -> bathroom??
- Bathroom exhaust: over or adjacent toilet??
- Non-patient care spaces impact
- Table 1 revisions
  - ACH, Temperature, Humidity, Pressure Relationships
Special requirements for plumbing installations in health care facilities
CSA Z317.1-09 Plumbing

- Specifications for hand hygiene sinks moving from Z8000-11; placements stay in Z8000-11
- Input from major manufacture’s of fixtures
- Input from IPAC & CHES
- Discussions on water temperature standards
Hand Hygiene Sink

- Functional
- Does not inhibit bacteria growth
- Maintenance friendly
- Accessible
- Affordable
- Antimicrobial materials
CSA Z317.1-09 Plumbing

• Methods for disinfection of hot water:
  – Copper Silver Ionization ✔
  – Chlorination ✔
  – Super Heating ✗
  – Chlorine Dioxide ?
  – Reverse Osmosis ?
  – Filtering ?
  – Other ?
CSA Z8000-11

- Standard for the Planning, Design and Construction of Healthcare Facilities in Canada
OASIS PRINCIPLES

OPERATIONS
ACCESSIBILITY
SAFETY & SECURITY
INFECTION CONTROL
SUSTAINABILITY
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 m² net per single room (including 3 pc washroom)  
51.6 m² net per double room (including two 3 pc washrooms)
• Start-up process for next edition Fall 2014
• Key Issues:
  – Class A Facilities: Lots of feedback!!!!
  – Class B Facilities: Impacts to mental health & rehab.
  – Class C Facilities: Ambulatory Care, Procedure & Mini Operating Rooms
  – What’s common to all???
  – Renew Membership….Volunteer????
Wayfinding Principles

• Is wayfinding really about signage??
• What else is there???
Building placement
Landmarks
Dept. adjacencies
Interior design
Lighting
Flooring types & inserts
Creativity
Green Design

BEST OF GREEN 2010
DESIGN + ARCHITECTURE
Hand Held Technologies

WiFi
Multicultural & Multilingual
High Definition Displays
Maps & User Guides
Touch Screen Kiosks
On-Line Access
Accessibility

- CSA B651-12 - Accessible design for the built environment
Terminology

Cardiac……………………..Heart
Diagnostic Imaging..........Radiology
Ophthalmology...............Eye Care
Otolaryngology.............Ear, Nose & Throat
Rheumatology..............Joints, Muscles, Bones
Endoscopy...................????
Dr. Smith’s office...........????

Use the K.I.S.S. Principle!
Linear Signage

- East Wing
- Patient Affairs
- Radiotherapy
- Rheumatology
- Viewing Chapel & Multi-faith Prayer Room
- Imperial College
Navigators
Antimicrobial

- A proposed new standard to define the age old question “What is antimicrobial?”
- Requirements:
  - Definitions
  - Research
  - Product types
  - Testing & verifications
  - Certifications
  - Evaluations
Z317.5-98 Illumination

- Another resuscitation and renewal
- Start-up Fall 2014
- Membership ..... Volunteers?
- 1998 to 2014… the world has changed!!
Driving Factors for the Z1600 Update

- 2 updates to NFPA 1600
  - 2010 & 2013
- ISO – updates
  - Business Continuity
  - Emergency Management
- More major disasters
- Aging infrastructure
- Gaps in existing standards
- Ability to leverage existing expertise
Real Life
Utilizes a Management System Approach

Plan
- Legal & other requirements
- Hazard & risk identification & assessment
- OHS objectives & targets

Do
- Preventive & protective measures
- Emergency prevention, preparedness, & response
- Competence & training
- Communication & awareness
- Procurement & contracting
- Management of change

Act
- Management review
- Continual improvement

Check
- Monitoring & measurement
- Incident investigation & analysis
- Internal audits
- Preventive & corrective action
## Timing of Post-Occupancy Evaluation

<table>
<thead>
<tr>
<th>Operational Review</th>
<th>Performance Review</th>
<th>Strategic Review</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3-6 months</strong></td>
<td><strong>12-18 months</strong></td>
<td><strong>3-5 years</strong></td>
</tr>
<tr>
<td>Looks back over project delivery</td>
<td>Looks back at the building in use</td>
<td>Looks back but also forward and long-term</td>
</tr>
<tr>
<td>• How well did the delivery work?</td>
<td>• How has the building performed over a seasonal cycle?</td>
<td>• How has the organizational need changed?</td>
</tr>
<tr>
<td>• Are there any immediate problems that require fine-tuning?</td>
<td></td>
<td>• What should the building response be?</td>
</tr>
</tbody>
</table>

Source: University of Westminster & Association of University Directors of Estates
CSA Communities of Interest

Currently +20,000 members
CSA Standards App

iTunes Preview

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Description

Z7396.1-12 – Medical gas pipeline systems – Part 1: Pipelines for medical gases, medical vacuum, medical support gases, and anaesthetic gas scavenging systems

Medical Gas Interactive Standard (Z7396.1) Support

View More by This Developer
CHES & CSA

CHES SCiSS

Canadian Healthcare Engineering Society - Société canadienne d’ingénierie des services de santé

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Canadian Standards Association
CSA National Regulators Forum

- Representatives from 10 provinces, 3 territories
- Information sharing and collaboration
- “Cross Country Checkup”
- Raising the bar across the country
CSA Numbering Standard
Need Training???

http://shop.csa.ca
Raise The Bar

Standards help advance today, while anticipating tomorrow
Thank you and Questions

Richard Dixon
604-619-1768
dixonconsulting@gmail.com