Standards Collaborative

Enabling solutions, enhancing health outcomes ... together
Created in 2001 as an independent, not-for-profit organization, Canada Health Infoway is funded by the federal government to accelerate the development and adoption of electronic health record projects in Canada that will be compatible with a national electronic health information system.

Since its inception, Canada Health Infoway’s vision has been clear:

A high-quality, sustainable and effective Canadian health care system supported by an infostructure that provides residents of Canada and their health care providers with timely, appropriate and secure access to the right information when and where they enter into the health care system.

Respect for privacy is fundamental to this vision.
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Standards Support Interoperability, Safety and Quality Patient Care

Standards facilitate information exchange and are a critical foundation for an interoperable electronic health record (iEHR).

They create the opportunity for future cost reduction as systems converge on pan-Canadian and international standards. But more importantly, common data and communication standards support timely, appropriate diagnosis and treatment and improve planning and coordination of care. In addition, standards can reduce medical error and increase patient safety. The following clinical scenario demonstrates how standards contribute to the safety, quality and efficiency of patient care:

An 89-year-old woman living independently comes to the emergency room in mid-December confused and unable to eat after experiencing flu-like symptoms for three days. A chest x-ray shows an area of vague abnormality, but by comparing it with the previous digital image from two years ago, Dr. Smith can see that it is definitely a new problem and diagnoses pneumonia. He then checks the public health system and sees that the patient has received a flu shot, which makes it more likely that the patient’s pneumonia is bacterial and requires an antibiotic. As he starts to prescribe the antibiotic, the system checks her drug profile and warns him that the patient is on a cholesterol pill that has a dangerous interaction with the first-choice antibiotic. He prescribes a different drug and sends her home in the care of her family.

In this scenario, Drug, Digital Imaging and Public Health standards are just a few of the standards required to provide safe, quality clinical information in the delivery of care.

Without these standards enabling the iEHR:

1) Dr. Smith would have had to order a CT scan to clarify her chest x-ray abnormality, increasing the length of time in the emergency room and increasing the cost of services provided.

2) The patient would have been seen as at higher risk for influenza pneumonia, which does not respond to antibiotics and, as a result, the doctor would have possibly postponed antibiotic treatment.

3) The first-choice antibiotic would have been prescribed, creating a dangerous adverse drug reaction when combined with the ongoing cholesterol medication.
EVERYONE BENEFITS FROM STANDARDS

The standards defined by the Standards Collaborative are the building blocks for the health information exchange that is essential to an interoperable EHR in Canada. In addition to improving patient care, some examples of the benefits of standards and interoperable systems include:

Benefits for Patients
- Dramatic reduction in the need to repeat health history each time they encounter a health care provider
- Better understanding of their own health history
- A consistent health history that is easily accessible and understandable by a range of providers
- Reduction in duplication of diagnostic procedures
- Better health outcomes
- Better coordination of services across providers
- A personal health history that accumulates data with each encounter and is easily understandable across a range of providers

Benefits for Health Care Providers
- Improved quality of care through timely access to consistent data
- Reduction in duplication of effort
- Shorter time between stages in care process
- Reduction in business costs and minimization of risks
- Increased use of structured and measurable information rather than free-text only which allows faster and more reliable review of health information and increases user confidence
- Reduced reliance on verbal and anecdotal exchange of health information
- More accurate and effective communication among providers
- Better ability to consolidate clinical findings
- Higher probability of positive patient outcomes
Benefits for Vendors

- A market advantage for participating vendors who get in early and can influence the standards
- The opportunity to use internationally recognized standards which may provide improved access to prospective customers in Canada and around the world
- Provides a competitive edge for worldwide trading of products and services
- Increased value of products and services to clients

Benefits for Service Delivery Organizations

- Ability to reuse solutions implemented elsewhere in Canada, leveraging lessons learned as well as change management and implementation strategies
- A broader base of comparable data for monitoring and measuring performance
- Improved ability to work effectively in a regionalized or collaborative capacity with other organizations across geographies and care settings
- Ability to interface with the interoperable EHR for access to computable data from a vast array of sources beyond an organization’s boundaries
- Higher confidence in vendor software products due to improved ability to predict suitability for use, effectiveness and return on investment

Benefits for Jurisdictions

- Increased reliability and flexibility in allocating limited system, human and financial resources in the delivery of health services through improved interoperability and comparability of information and business processes among organizations and across a wide range of settings
- More accurate, reliable and comparable data as the foundation for responsive policy decisions, capacity planning and program monitoring
- More accurate and timely comparability with other jurisdictions on the effectiveness of health service delivery programs, leading to improved program planning and possibly providing a better foundation for resource allocation
- Participate in, and have access to, the coordinated work effort of many federal, provincial and territorial jurisdictions in the development of standards. This collaboration and sharing of health business requirements and their subsequent solutions offer a rich set of capabilities that could not reasonably be developed by just one jurisdiction alone.
Launched in 2006, the Standards Collaborative is a Canada-wide coordination function created to support and sustain health information standards in Canada.

HISTORY
In 2006, Canada Health Infoway and the Canadian Institute for Health Information (CIHI) agreed to establish a new Canada-wide coordination function to support and sustain health informatics standards on a national scale. This agreement was reached after extensive consultation with and approval by, both Infoway’s and CIHI’s boards as well as the federal/provincial/territorial Conference of Deputy Ministers of Health. There was also a thorough engagement and consensus-building consultation with domestic as well as international health information standards stakeholders and interests.

On the standards front, Infoway has over 20 completed or in process projects, with a total investment in standards development to date of $33M. In addition, Infoway has dedicated another $21M to the Standards Collaborative to (SC) for the, support and maintenance of the standards, services to health information standards stakeholders in Canada and liaison with international Standards Development Organizations (SDOs).

In December of 2007, the Infoway Board approved the Standards Collaborative’s 2012 Strategy. In addition, the Board approved the portfolio of standards to be supported and funding for the 2008/09 fiscal year.

Funding options from 2009 to 2012 are to be defined and developed during the next 12 months. The Board also confirmed the SC’s status as a service within Infoway for the duration of Infoway’s mandate, subject to appropriate funding.

STRATEGIES
The Standards Collaborative is assisting Canada’s provinces and territories to accelerate the implementation of standards and health information solutions, through four complementary strategies:

- **Increase awareness and understanding** of Canada Health Infoway, Standards Collaborative and pan-Canadian health information standards and how they enable interoperability of health IT solutions
- **Engage a broad spectrum of stakeholders** throughout the standards life cycle to ensure the ongoing relevance of standards for all
- **Stimulate market demand for standards** to facilitate the uptake of pan-Canadian standards locally, regionally and nationally. In addition, influence, leverage and align with international standards.
- **Reduce the risks and costs** associated with the uptake of standards by continuing to provide products and services for pan-Canadian standards throughout the standards life cycle.
MANDATE

Hosted at Infoway, the mandate of the Standards Collaborative is:

- Establish standards to support the Infoway EHR mandate
- Provide services to support and maintain these standards
- Act in formal liaison role to international SDOs

Standards to support the Infoway EHR mandate:

- Client Registry Standards
- Diagnostic Imaging Standards
- Drug Standards
- iEHR Clinical Messaging Standards
- iEHR Technical Standards
- Laboratory Messaging and Nomenclature Standards
- National e-Claims Standards
- Patient Access to Quality Care Standards
- Physician Office Systems Requirements
- Provider Registry Standards
- Public Health Surveillance Standards
- Security and Consent Standards
- SNOMED® CT

Provision of services to support and maintain these standards:

- Implementation Support Services
- Conformance Services
- Maintenance Services
- Standards Collaborative Engagement and Process Services

International SDO Ambassador

- The SC is the Canadian ambassador for the domestic distribution, quality assurance, copyright, maintenance and support of standards through agreements with international SDOs
- The SC also supports Canadian delegates to international SDOs

Infoway and the Standards Collaborative are the official liaison for Canada to the following SDOs:

> Digital Imaging and Communications in Medicine (DICOM)
> Health Level 7 Inc. (HL7)
> International Health Terminology SDO (IHTSDO)
> International Organization for Standardization’s Health Informatics Technical Committee (ISO/TC 215), in conjunction with the Standards Council of Canada and the Canadian Standards Association
> Logical Observation Identifiers Names and Codes (LOINC®)
GOVERNANCE

To support the mandate of the Standards Collaborative, a new streamlined governance structure has been developed in consultation with, and endorsed by, a broad range of standards stakeholders in Canada.

This new governance model provides an opportunity for the pan-Canadian integration of health information standards mandates. The focus of the new model will be to address the entire standards life cycle, from standards development through to conformance and maintenance.

The following are the guiding principles identified in the development of this new governance model:

1) Provide for decision-making practices that ensure consensus, openness, and balance of interest to support the strategic direction and coordination of:
   a. Health information standards in Canada;
   and
   b. The services and processes of the Standards Collaborative (maintenance, conformance, education etc.).

2) Support a long-term solution for the Standards Collaborative that is portable to any custodian.

3) Streamline health information standards governance structures in Canada (number of committees and membership) and processes.

4) Recognize existing SDO governance policies and procedures.

5) Provide a core governance structure with the flexibility to establish task force groups to address issues with a specific scope and timeframe.

6) Ensure an effective and efficient approach to coordinate health information standards and related artifacts and their management.

7) Ensure transparency of process and progress to standards stakeholders.

8) Maintain a high level of communication to all standards stakeholders.
Standards Governance Structure

- Standards Council of Canada
- Canadian Standards Association
- Standards Collaborative Strategic Committee
- Standards Collaborative Coordinating Committee

- Technical Sub-Committee
- Clinical Sub-Committee
- Pan-Canadian Standards Group

Working Group (SCWG):
- SCWG #1: Population Health (Delivery of Care)
- SCWG #2: Individual Care (Delivery of Care)
- SCWG #3: Managing the Health System
- SCWG #4: Medication Management
- SCWG #5: Labs & Diagnostics
- SCWG #6: IT Privacy & Security Services
- SCWG #7: Non-Clinical Registries
- SCWG #8: Terminology Representation & Services
- SCWG #9: Infostructure & Architecture

Legend:
- Standards Custodians
- Strategic Level
- Coordination Level
- Indirect Accountability
- Standards Accountability

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Infoway Standards Collaborative InfoDesk 1 877 595 3417 standards@infoway-inforoute.ca
The Standards Collaborative governance model has been developed with three levels of committees and working groups: strategic, coordinating and domain levels.

**STRATEGIC LEVEL**

**Standards Collaborative Strategic Committee (SCSC):**
- Provides strategic direction for the development, maintenance, conformance and support of pan-Canadian standards and the services provided by the Standards Collaborative
- Makes decisions regarding key milestones in the standards life cycle for pan-Canadian standards such as “Stable For Use” and “Formal Approval”

**COORDINATING LEVEL**

**Standards Collaborative Coordinating Committee (SCCC):**
- Coordinates and guides pan-Canadian health information standards throughout the standards life cycle based on priorities and strategic directions set by the SC Strategic Committee
- Provides guidance on the processes and services provided by the Standards Collaborative

**Standards Collaborative Technical Sub-Committee (TSC)**
- Ensures technical alignment across pan-Canadian health information standards
- Provides technical guidance on SC services and activities

**DOMAIN LEVEL**

**Standards Collaborative pan-Canadian Standards Group (pCSG)**
- Provides pan-Canadian review and validation to support a pan-Canadian health information standards development project

**Standards Collaborative Working Group (SCWG)**
- Provides recommendations on the adoption and use of standards, and reviews and votes on the content of health information standards, particularly those involving maintenance

**Standards Collaborative Clinical Sub-Committee (CSC)**
- Supports clinical alignment and harmonization across pan-Canadian health information standards
- Provides clinical guidance on SC services and activities
SERVICES

The Standards Collaborative provides a single point of entry to create and sustain pan-Canadian standards through the following services:

Maintenance Services
Maintenance Services (MS) is responsible for ensuring pan-Canadian standards within the scope of the SC remain clinically and technically relevant and continue to meet the business needs of SC stakeholders. MS will ensure the timely release of the pan-Canadian standards so they are available to all SC members. MS includes the necessary interactions with standards development and maintenance organizations responsible for the components of the pan-Canadian standards.

Implementation Support Services
Implementation Support provides a single point of entry and clearing house to support the implementation of pan-Canadian standards.

Education and Training Services
Education and Training Services provides products and services in support of pan-Canadian and SDO-specific standards education and training in Canada, within the mandate of the Standards Collaborative and in alignment with policies of standards organizations.

Client Services & SDO Relations
Client Services & SDO Relations is the “keystone” service of the Standards Collaborative, supporting the domestic-to-international engagement with accredited Standards Development Organizations. The Standards Collaborative membership, SDO governance, standards IP (intellectual property) distribution and rights management, and the Partnership for Health Information Standards Conferences are component services provided to clients and members of the Standards Collaborative.

Conformance Services
The Standards Collaborative is responsible for coordinating the development and maintenance of the conformance statements for each pan-Canadian standard. Conformance statements can be described as declarations or statements which detail what a system does, followed by a test to ensure that the system does what it claims to do.

SC Engagement and Process Services
SC Engagement and Process Services, in collaboration with Infoway corporate services, supports the Standards Collaborative and our stakeholders in facilitating the uptake of pan-Canadian health information standards through the following services: communications, marketing, knowledge management, evaluation and stakeholder engagement. Additionally, the overall SC governance structure is supported, enabling integration of health information standard mandates in Canada across the entire standards life cycle.
Get Involved with the Standards Collaborative

The fastest way to learn about the current status of the Standards Collaborative, the standards and the EHR architecture is to monitor the Canada Health Infoway forums by visiting the SC at:

www.infoway-inforoute.ca/en/WhatWeDo/SCOverview.aspx

These forums support communication and exchange among various communities interested in health care and health informatics deliberation and consensus-building on standards.

- Standards forums support collaboration during the electronic health record architecture, standards development, maintenance and approval processes through the publication of specification materials and the establishing of discussion groups; these forums exist for each Standards Collaborative Working Group
- Specific forums also exist for Canadian discussion and contribution to international SDOs including HL7 Inc., IHTSDO and ISO/TC 215. These forums offer various SDO-specific documents and resources such as standards, current work items and constituency meeting presentations and minutes
- Forums also support working groups on subjects related to various topics such as expert advice, approvals, terminology, technical design, privacy and security

FOR MORE INFORMATION CONTACT:

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JOIN THE STANDARDS COLLABORATIVE

Infoway Standards Collaborative provides Canadian health information system stakeholders with easy access to a comprehensive and contemporary array of pan-Canadian and other health information and EHR standards. These standards, aligned with international norms, have been adapted to Canadian-based business and clinical requirements, and are approved and maintained in an open, collaborative and balanced manner.

Standards Collaborative membership offers streamlined access to health information standards and related services. It is unique in providing a single point of entry to create and sustain pan-Canadian standards through the following services:
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- Client Services & SDO Relations
- Development Support
- Education and Training
- Implementation Support
- Conformance
- Maintenance
- Standards Collaborative Engagement and Process

Infoway Standards Collaborative works to promote and build pan-Canadian consensus, leveraging and harmonizing the efforts of the federal, provincial and territorial jurisdictions, health care professionals, vendors, academics, and a host of agencies and associations across the country. Its membership is strong and growing, and is composed of the leading private- and public-sector EHR and informatics stakeholders and interests. Three types of membership in the Standards Collaborative are available:

1) Corporate 2) Individual 3) Student

Membership in the Standards Collaborative is economical and efficient compared to the cost and overhead of maintaining separate memberships in each SDO. Additional membership benefits include:

- Streamlined access to the full array of HL7, SNOMED CT, LOINC, DICOM and ISO/TC 215 standards
- Voting rights on the content and reconciliation of standards
- Serve in elected positions within the Infoway Standards Collaborative governance structure and represent Canada at various SDOs
- Discounts on Infoway Standards Collaborative conferences, education and training, and other events and services
- Access to a searchable online SC membership directory to facilitate networking with colleagues in the health information standards community

The Partnership Conference is a semi-annual meeting of the Standards Collaborative, where members and other stakeholders collaborate on pan-Canadian and international standards and architecture, share progress and lessons learned and stay informed on what’s new in Canada’s health information standards community. The Partnership Conference is also the principal venue for the face-to-face meetings of the Standards Collaborative Working Groups and Standards Development Organization constituency meetings. The Partnership Conference is the principal event for the domestic health information standards and architecture community, and is open to all interested attendees.
Standards Collaborative Working Groups

Members with a particular knowledge and/or interest are encouraged to participate in any of our nine Standards Collaborative Working Groups (SCWGs).

The scope of these working groups is to review and provide feedback on health information standards and architecture activities throughout the standards life cycle in accordance with the direction and guidance provided by the various Standards Collaborative governance committees.
POPULATION HEALTH (DELIVERY OF CARE)
SCWG #1: (to be launched 2008/09)

Scope:
Immunization
Communicable Disease Management
  • Public Health Case
  • Public Health Outbreak
  • Public Health Investigations

INDIVIDUAL CARE (DELIVERY OF CARE)
SCWG #2:

Scope:
Electronic Health Records
Shared Health Record
  • Adverse Events
  • Allergy
  • Clinical Observations
  • Discharge Care Summary
  • Health Conditions
    > Encounters and Episodes or Care Compositions
    > Professional Services
    > Referral and Referral Notes
Health Summary Records
Chronic Disease Management

MANAGING THE HEALTH SYSTEM
SCWG #3:

Scope:
Claims
Patient Administrative
Wait Times
Secondary Use
Research
Clinical Data Warehouse

MEDICATION MANAGEMENT
SCWG #4:

Scope:
Prescribing
Dispensing
Patient (Drug) Queries
Drug Queries
Contraindications

LABS & DIAGNOSTICS
SCWG #5:

Scope:
Human Laboratory
Non-Human Laboratory
Diagnostic Imaging
Diagnostic Investigations

INFOSTRUCTURE & ARCHITECTURE
SCWG #6:

Scope:
Data Types
Common Message Element Types
Message Wrappers
Common Message Patterns
Broadcast
EHR Record Retrieval
Event Tracking
Queue Management (Polling)
Retract
OIDS

NON-CLINICAL REGISTRIES
SCWG #7:

Scope:
Client Registry & Identification Management
Provider Registry & Identification Management
Location Registry & Identification Management
Organization Registry & Identification Management

IT PRIVACY & SECURITY SERVICES**
SCWG #8:

Scope:
Security
Privacy
Consent
User Registries (A&A)
** Does not include policy, regulatory issues or legislation

TERMINOLOGY REPRESENTATION & SERVICES
SCWG #9:

Scope:
Terminology Services
HL7 Common Terminology Services (CTS)
Terminology Models
HL7 Vocabulary Worksheet
Selecting and Approving Standards

When selecting and approving a standard, committee members consider clinical appropriateness, interoperability, financial factors, governance, business and technical requirements.

The selection process is based on the principles of transparency, consensus building, and timeliness. This process is referred to as the pan-Canadian Standards decision making process and includes the following three key decision points.

#1: STANDARD STRATEGY SELECTION (SSS) DECISION

At this first key decision point, because of the significant impact on the implementation of systems, a strategy on whether a standard should be adopted, adapted or developed is required before initiating further work on the standard. An in-depth options analysis is conducted and one or more of the following strategic recommendations may be accepted in order to meet a defined business need:

- **Adopt** an existing standard with no modifications
- **Adapt** existing standard while doing some modifications or additional development work
- **Develop** a new standard using existing SDO frameworks like HL7

#2: STABLE FOR USE (SFU)

At this second key decision point, the Stable For Use approval indicates that the standard is ready for use by early adopters including both limited production roll-outs as well as pilot implementations. Users of such specifications should understand that changes may arise from the experiences of these implementations as well as from potential ballot activities that may be underway. However, it is expected that these changes will be well understood and documented for the benefit of potential adopters.

#3: FORMAL APPROVAL (FA)

At this third key decision point, the Formal Approval designation indicates that the standard has completed any formally recognized and appropriate Standards Development Organization balloting or approval processes as well as completed a pilot test or early adopter implementation recognized by the SC committees.
Internationally Based Standards

Infoway Standards Collaborative is Canada’s representative to several international standards organizations.

Many of the members of the Standards Collaborative participate in international initiatives to influence, leverage and align with international standards.

These international standards are then adopted or adapted as the basis of pan-Canadian standards. This approach ensures interoperability, reduces costs and stimulates market demand for vendor’s solutions based on pan-Canadian standards. Below are some examples of the national and international standards that are the basis of our pan-Canadian standards:

- CCI
- DICOM
- Health Canada Drug Product Database
- Health Level 7
- ICD-10-CA
- IHE
- ISO/TC 215
- LOINC®
- SNOMED CT®
- Unified Codes for Unit of Measure
1. SNOMED CT®

Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®) is a controlled medical vocabulary licensed and supported by the International Health Terminology SDO. It provides a common language that enables a consistent way of indexing, storing, retrieving and aggregating clinical data across specialties and sites of care. SNOMED CT® is a comprehensive, multilingual clinical terminology that provides clinical content and expressivity for clinical documentation and reporting.

BENEFITS

- Captures clinical information at a high level of detail needed for the provision of care
- Enables health care organizations to develop effective analysis applications to:
  > Conduct outcomes research
  > Evaluate the quality and cost of care
  > Design effective treatment guidelines
- SNOMED CT® is currently part of the following Stable For Use standards:
  > Drug (active ingredient in pharmaceuticals)
  > Lab (microorganism, supporting clinical information)
  > iEHR (medical conditions)
  > Public Health Surveillance (immunization, etc.)

SNOMED CT® has been available in Canada since August 2007 under license to Standards Collaborative members in good standing.

BUSINESS FUNCTIONS

The following are examples of clinical groupings that can be described using SNOMED CT® and have been specified as part of pan-Canadian health information standards:

- Diagnosis
- State of Diagnosis
- Family History
- Genetic Condition
- Non-Drug Agent Adverse Reaction
- Non-Drug Offending Agent Type
- Non-Drug Offending Agent Description
- Severity relating to Non-Drug-related Severities of Adverse Reactions
- Allergy: Non-medication Allergy
- Risk Factor
- Exposure
- Physical/Physiological Therapeutic Interventions
- Obstetric/Fetal interventions
- Cognitive, Psychosocial and Sensory Therapeutic Interventions
- Other Health Interventions
- Clinical Symptom/Health Problem (Clinical Finding)
- Physical Assessment Finding
- Psychological/Mental Assessment
- External Cause
- Place of Occurrence
- Anatomical Site
- Episodicity
- Course
- Occurrence
- Number
- Onset
- Patient Health Problem

SIGNIFICANT MILESTONES:

- Approved for the Standards Selection Strategy by the Infoway’s EHR Standards Steering Committee (February 2006)
- Infoway Standards Collaborative has established a National Product Centre which has been operational since August 2007
- SNOMED CT® French translation project has been initiated to translate priority SNOMED CT® components for implementation in Canada. Translation is targeted to begin in early 2008.
2. HL7

Health Level 7 (HL7) Standards are internationally recognized as the prominent standards for clinical and related financial and administrative messaging. The HL7 Version 3 (HL7 V3) suite of messaging standards and the HL7 Clinical Document Architecture (CDA) standards provide the basis for pan-Canadian EHR interoperability. These standards provide the inter-organizational sharing of data and computable semantic interoperability which are keys to the Canadian EHR vision. All new messaging standards developed by Infoway for the interoperable EHR utilize HL7 V3 or CDA Release 2.

While there is a large installed base of HL7 V2.x applications within organizations across Canada, they are designed for intra-organizational communications and are not appropriate for the inter-organizational Canadian EHR. Infoway provides the business and technical support to bridge the legacy HL7 V2.x environment to the pan-Canadian EHR standards.

**THE STATUS OF HL7 V3 IS OUTLINED BELOW:**

- Pan-Canadian Stable For Use (SFU) HL7 V3 standards have been approved by the SC Strategic Committee for Laboratory, Drugs, Client Registry, Provider Registry, Clinical Documents, Shared Health Records, Immunizations and Electronic Claims. Other standards are in development
- Pan-Canadian HL7 V3 Standards have been successfully implemented across Canada by a variety of vendors and jurisdictions
- Infoway, through the Standards Collaborative, provides business and technical support for the implementation HL7 V3
- Canada is recognized internationally for its contributions to the development and implementation of the HL7 V3 standards including contributions to the technical infrastructure of the HL7 methodology and tooling
- The HL7 V3 Reference Information Model (RIM) – the basis for the V3 Standards – is a recognized and accepted ISO standard. HL7 V3 Normative Editions of HL7 V3 messaging standards have been released yearly since 2005
The pan-Canadian Laboratory Observation Code Database (pCLOCD) is a terminology that is based on the Logical Observation Identifiers Names and Codes (LOINC®) and supports the coding of observations with a significant focus on the laboratory domain.

**THE pCLOCD IS CURRENTLY PART OF THE FOLLOWING PAN-CANADIAN STANDARDS:**

- Lab Messaging and Nomenclature
  > Human & non-human lab
- Public Health Surveillance

The LOINC® database was devised and is maintained by the Regenstrief Institute for Health Care to establish a set of universal names and ID codes for identifying laboratory and clinical test results (website http://www.regenstrief.org/loinc/).

The LOINC® database has been constrained to include only observations applicable to Canadian laboratory observations and the pCLOCD is compliant with the LOINC® terms of use.

The purpose of the pCLOCD is to facilitate the exchange and pooling of results, such as blood hemoglobin or serum potassium, for clinical care, outcomes management and research. Currently, most laboratories and other diagnostic services use HL7 to send their results electronically from their reporting systems to their care systems. However, most laboratories and other diagnostic care services identify tests in these messages by means of their internal and idiosyncratic code values. Thus, the care system cannot fully "understand" or properly file the results they receive unless they either adopt the producer’s laboratory codes (which is impossible if they receive results from multiple sources), or invest in the work to map each result producer’s code system to their internal code system. LOINC® codes are universal identifiers for laboratory and other clinical observations that solve this problem.

The pCLOCD consists, among other things, of a series of LOINC® records intended to identify the test result, clinical observation or test requests. There are several core LOINC® attributes or fields that define each record. The level of detail in the LOINC® field definitions was intended to distinguish tests that are usually distinguished as separate test results within the master file of existing laboratory systems.

**EACH LOINC® RECORD CORRESPONDS TO A SINGLE TEST OR PANEL AND INCLUDES FIELDS FOR SPECIFYING:**

1. Component (analyte) – e.g. potassium, hemoglobin, hepatitis C antigen.
2. Property measured – e.g. a mass concentration, enzyme activity (catalytic rate).
3. Timing – i.e. whether the measurement is an observation at a moment of time, or an observation integrated over an extended duration of time – e.g. 24-hour urine.
4. The type of sample – e.g. urine, blood.
5. The type of scale – e.g. whether the measurement is quantitative (a true measurement), ordinal (a ranked set of options), nominal (e.g. E.coli; Staphylococcus aureus), or narrative (e.g. dictation results from pathology).
6. Where relevant, the method used to produce the result or other observation.

In addition to the core LOINC® attributes the pCLOCD includes other fields:

- for administrative and maintenance purposes such as record level version identifiers, and
- to provide guidance for use in pan-Canadian messages (such as the applicable result value type that is expected) and common terminology to facilitate understanding of the terms.

The pCLOCD consists of three fundamental changes to LOINC®:

1. The addition of attributes or fields to the LOINC® framework that facilitate the documentation of Canadian naming conventions, where applicable.
2. The exclusion of test code definition records that reflect tests not expected to be required for electronic communication in Canada at this time.
3. The addition of codes for tests performed in Canada but not yet defined within the LOINC® database as published by the Regenstrief Institute.

The pCLOCD is maintained by the Standards Collaborative and new LOINC® versions are integrated within one month of publication by Regenstrief. Implementation guidelines are available and a maintenance process has been established for users who wish to request additions or changes to LOINC®.

The pCLOCD is currently being translated into Canadian French and the translation will be made available to LOINC® to distribute internationally. Once translated, the French and English terms will be integrated into one bilingual pCLOCD.
Pan-Canadian Health Information Standards for the EHR

The interoperable EHR is an integrated patient-centric health record which will provide a longitudinal view of an individual’s key health history and care, including physician visits, hospitalizations, diagnostic images and reports, laboratory test results, prescribed drugs and immunizations.

Pan-Canadian health information standards will enable health care providers to update, share, access, manage and safeguard integrated patient-centric health records.

To date, twenty pan-Canadian health information standards projects have been completed or are in process by Infoway, representing a total investment in standards development of $33 million. These include:

<table>
<thead>
<tr>
<th>Client Registry</th>
<th>Identify every Canadian patient uniquely.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td><strong>BENEFITS</strong></td>
</tr>
<tr>
<td>Accurately identifying patients, health care providers and health service delivery organizations is a critical underpinning of electronic health information systems. Two types of registries are currently being established – client and provider. Client Registries are single directories or “White Pages” in each province or territory that contain current patient health identification numbers, demographic information, as well as historic demographic information.</td>
<td><strong>MESSAGING &amp; TERMINOLOGY</strong></td>
</tr>
<tr>
<td></td>
<td>• Improve completeness and accuracy of an individual’s available health information to support clinical decision-making</td>
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<tr>
<td></td>
<td>• Improve information management, resulting in reduced administrative time and costs</td>
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<tr>
<td></td>
<td>• Improve access to integrated patient information across the continuum of care</td>
</tr>
<tr>
<td><strong>BUSINESS FUNCTIONS</strong></td>
<td><strong>STATUS</strong></td>
</tr>
<tr>
<td>• Uniquely identifies a client within the health care system</td>
<td>Stable For Use</td>
</tr>
<tr>
<td>• Acts as a repository of client demographic information: who may or may not have received health services</td>
<td></td>
</tr>
<tr>
<td>• Queries, adds, updates, resolves duplicates and deletes client demographics as required</td>
<td></td>
</tr>
</tbody>
</table>

Pan-Canadian Health Information Standards

The interoperable EHR is an integrated patient-centric health record which will provide a longitudinal view of an individual’s key health history and care, including physician visits, hospitalizations, diagnostic images and reports, laboratory test results, prescribed drugs and immunizations.

Pan-Canadian health information standards will enable health care providers to update, share, access, manage and safeguard integrated patient-centric health records.

To date, twenty pan-Canadian health information standards projects have been completed or are in process by Infoway, representing a total investment in standards development of $33 million. These include:

<table>
<thead>
<tr>
<th>Client Registry</th>
<th>Identify every Canadian patient uniquely.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td><strong>BENEFITS</strong></td>
</tr>
<tr>
<td>Accurately identifying patients, health care providers and health service delivery organizations is a critical underpinning of electronic health information systems. Two types of registries are currently being established – client and provider. Client Registries are single directories or “White Pages” in each province or territory that contain current patient health identification numbers, demographic information, as well as historic demographic information.</td>
<td><strong>MESSAGING &amp; TERMINOLOGY</strong></td>
</tr>
<tr>
<td></td>
<td>• Improve completeness and accuracy of an individual’s available health information to support clinical decision-making</td>
</tr>
<tr>
<td></td>
<td>• Improve information management, resulting in reduced administrative time and costs</td>
</tr>
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<td></td>
</tr>
</tbody>
</table>
## Provider Registry

<table>
<thead>
<tr>
<th>INTRODUCTION</th>
<th>BENEFITS</th>
<th>MESSAGING &amp; TERMINOLOGY</th>
<th>STATUS</th>
</tr>
</thead>
</table>
| A Provider Registry is a single directory or “Yellow Pages” per jurisdiction providing a comprehensive and unambiguous identification of participating providers, including physicians, pharmacists, nurses and other health care providers. | • Accurate identification of a provider’s record of care  
• Improve information management, resulting in reduced administrative time and costs  
• Increase access to integrated patient information across the continuum of care | MESSAGING  
HL7 V3.0  
TERMINOLOGY  
HL7 Domain Tables | Stable For Use |

### BUSINESS FUNCTIONS

- Uniquely identifies a health care provider within the health care system  
- Acts as a repository of health care provider demographic information  
- Queries, adds, updates health care provider demographics as required

## Laboratory Information Systems

<table>
<thead>
<tr>
<th>INTRODUCTION</th>
<th>BENEFITS</th>
<th>MESSAGING &amp; TERMINOLOGY</th>
<th>STATUS</th>
</tr>
</thead>
</table>
| Laboratory test results are a vital part of a patient’s EHR and provide health care providers with data to support decision-making and case management at the point of care. | • Enhance patient safety  
• Increase accuracy of medical profile  
• Reduce unnecessary duplicate tests | MESSAGING  
HL7 V3.0  
TERMINOLOGY  
HL7 Domain Tables, pCLOCD (LOINC), SNOMED CT, Unified Code for Units of Measure (UCUM) | Human – Stable For Use; Non-Human – Standards Strategy Selection |

### BUSINESS FUNCTIONS

**HUMAN**

Support the sharing of laboratory information between clinicians and laboratories through a Jurisdictional Laboratory Information System (JLIS):

- Submit orders
- Query orders to determine status of results

Disciplines supported by the laboratory standard are:

- Clinical Chemistry (glucose)
- Hematology (hemoglobin)
- Microbiology (urine culture)

**NON-HUMAN**

- Support sharing of non-human laboratory information between clinicians and laboratories
- Includes water, food, animal suspicious substances testing and environmental swabs in point-to-point interfaces that affect population health.

- Activate or revise an order
- Access results
Diagnostic Imaging (DI) systems, along with Laboratory and Drug Information Systems, provide the majority of clinical data required for the electronic health record. DI systems enable health care providers to electronically collect, store, manage, distribute and view patient radiology reports and images entirely in digital format, without the need for film. They facilitate sharing DI information and provide access to longitudinal DI information to authorized care providers across health care delivery organizations regardless of where the images were acquired and the reports created.

**INTRODUCTION**

**BENEFITS**

- More efficient use of diagnostic imaging equipment and associated health care provider’s time
- Ability to interpret diagnostic imaging results remotely
- Improve quality of diagnostic image interpretation through the use of viewing tools and access to diagnostic imaging history
- Reduce film and storage costs
- Enhance radiologist productivity
- Increase access to images and reports across the continuum of care

**MESSAGING & TERMINOLOGY**

**MESSAGING**

DICOM, HL7 V2.x and V3.0

**TERMINOLOGY**

SNOMED CT, DICOM, ICD-10-CA, CCI, LOINC

**INTEGRATION PROFILES**

IHE XDS-I, SWF, PIR, CPI, PGP, KIN, PDI

**STATUS**

Stable For Use

**BUSINESS FUNCTIONS**

**RADIOLOGY INFORMATION SYSTEMS (RIS)**

- Appointment booking
- Patient registration and tracking
- Handling consent management
- Workflow management including exam requisitions (orders), exam scheduling and management (prioritization, changes, cancellation) and communication of exam status
- Management of patient scanning
- Creation, management and distribution of diagnostic imaging reports
- Workflow management and reporting
- Billing
- Handling interactions with other systems (HIS/ADT, PACS, imaging modalities, EHR/DI Repository)

**PICTURE ARCHIVING COMMUNICATION SYSTEMS (PACS)**

- Storage, management and archiving of DI studies received from other systems (e.g. modalities, another PACS system)
- Finding and retrieving DI studies
- Distribution of DI studies to other systems (e.g. EHR/DI Repository, another PACS system)
- Presentation and analysis of images
- Handling of interactions with other systems (e.g. RIS, imaging modalities, teleradiology systems)

**DIAGNOSTIC IMAGING REPOSITORY (DIR)**

- Storage, management and archiving of documents, including imaging studies, presentation states, diagnostic reports and diagnostically significant images associated with the report content along with other evidence documents derived from image processing (e.g., image enhancement, exploration and measurement)
- Finding and retrieving relevant diagnostic imaging documents
- Distribution of imaging documents to authorized users/systems
- Handling of interactions with other systems (e.g. PACS, RIS, EHR Viewer, Client Registry)

---

*Note: The pan-Canadian Standards Group for Diagnostic Imaging and Teleradiology has determined that the most appropriate means to facilitate seamless sharing of DI information between Diagnostic Imaging Repository, RIS, PACS and EHR consumers is through the IHE XDS-I Integration Profile. XDS-I is aligned with the Infoway EHRS Blueprint and has been endorsed as a Canadian EHR Interoperability Standard along with several other radiology and infrastructure profiles to provide a common standards-based framework for seamless sharing of health information among health care providers and health care organizations. This supports optimal patient care and enables local, regional and national health information networks.*
### Drug Information Systems (Version I & II)

<table>
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<tr>
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</thead>
</table>
| Drug Information Systems provide physicians and pharmacists with a better ability to manage a patient’s complete medication regimen. | • Decrease adverse drug events  
• Improve patient compliance with drug therapy  
• Improve prescribing practice  
• Decrease costs of physician visits, hospitalizations and long-term care placements related to drug complications  
• Increase access to an integrated drug profile across the continuum of care | **MESSAGING**  
HL7 V3.0 | **SFU**  
Stable For Use |

### BUSINESS FUNCTIONS (VERSION I)

- Prescribing
- Dispensing
- Adding other medication such as physician samples or over-the-counter medications
- Patient medication queries
- Record and query drug-to-drug interactions
- Record, update and query an allergy intolerance
- Record, update and query an adverse drug reaction
- Record, update and query medical conditions
- Record and query basic patient observations (e.g. blood pressure)
- Record, update and query immunizations
- Drug queries
- Contraindications checking
- Prescription status management (e.g. prescriptions that are put on hold)
- Retract information
- Clinical notes
- Consent management
- Record and share information on Professional Services (e.g. education and training on blood glucose meter)

### BUSINESS FUNCTIONS (VERSION II)

The ability for physicians and pharmacists to share clinical information and support transactions such as:

- Prescribing
- Dispensing
- Adding other medications such as physician samples or over-the-counter medications
- Patient medication queries
- Drug queries
- Contraindications checking
- Prescription status management (e.g. prescriptions that are put on hold)

Note: transactions that are no longer in version II that where in version I have been transferred to more appropriate domains e.g. interoperable EHR, PHS, etc.
# Interoperable EHR

**Access, manage and store long-term view of patient health history and interactions**

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</table>
| iEHR clinical information standards enable the sharing of non-domain clinically relevant priority data stored in the SHR repository. These include the patient’s health service encounters, episodes of care, the providers’ clinical observations, identification and diagnosis of health conditions, professional services received including discharge summaries and other types of care summaries, clinical reports and referrals. Additionally, a standard has been created which will allow a clinical profile (summary) to be created of all relevant patient data in the SHR and other domain repositories at the time of the request. These standards, in conjunction with other pan-Canadian standards, will give authorized providers rapid access to all up-to-date health information to support clinical decision-making and continuity of care. | - Increase the accuracy and completeness of the patient’s overall clinical profile (summary) by including encounters, episodes, clinical assessment findings, care summaries, etc.  
- Increase access to integrated patient information across the continuum of care  
- Improve access to health care providers and services  
- Reduce medical errors  
- Informed prescribing and clinical decision-making  
- Enhance patient safety  
- Reduce unnecessary duplicate tests | **MESSAGING**  
HL7 V3.0  
**TERMINOLOGY**  
HL7 Domain Tables, SNOMED CT, ICD-10-CA, CCI, Free Text, LOINC | Stable For Use |

## BUSINESS FUNCTIONS

- Sharing of high-priority clinical information that is not addressed via other domain standards (e.g. drugs, labs) that are stored in the EHR Shared Health Record Repository (SHR)
- Support clinical information-sharing generated primarily on the basis of clinical assessments. These include:
  - **Clinical Observations** – Allows users to record and retrieve a wide variety of coded patient clinical history, physical examination findings and other assessment findings such as blood pressure; allows users to record and retrieve clinical information that is usually communicated as text notes (e.g. social history) and narrated/transcribed notes (documents) such as operative reports and other procedural reports. Such reports may contain both coded and non-coded (text) information.
  - **Professional Services** – Allows users to record and retrieve information about professional health care services the patient has received e.g. cognitive therapies (targeted to changing behaviour or thought perspective) or direct physical manipulation or modification of the patient such as surgery, physical therapy, etc.
  - **Health Conditions** – Allows users to record and retrieve information about patient illnesses, injuries or other alterations in physiological state e.g. diabetes pregnancy, provides a “problem list” for providers – a current and up-to-date list of active patient problems that need to be managed.
  - **Care Compositions** – Allows users to group relevant information into “folder-like” groupings for ease of viewing and retrieving information.
- Encounter-based care composition (collection) – Allows all health service events associated with a particular encounter with the health system to be grouped. e.g. hospitalization for knee replacement
- Condition-based care composition (collection) – Allows multiple health service events and encounters related to a single health condition to be grouped e.g. multiple sclerosis
- Localized condition-based care composition (collection) – Used for tracking, over time, aspects of a health condition localized to a particular body area and related health service events and encounters
- Care-based care composition (collection) – Allows multiple health service events, encounters and condition-based collections to be grouped based on type of care e.g. cardiovascular care, respiratory care, gynaecological care
- Discharge/Care Summary – Allows users to record and retrieve any document that summarizes care provided to a patient during a particular health service encounter or series of encounters.
- EHR Clinical Summary/Profile Retrieval – Allows users to quickly find information about all health care services that have been recorded in the EHR for a particular patient, regardless of whether they are domain- or SHR-related. The profile can be customized based on the needs of particular provider groups.
# Public Health Surveillance Solution
Access, manage and store health data to protect the public health.

<table>
<thead>
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</table>
| The Public Health Surveillance Solution supports communicable disease case management, outbreak management, immunization management, materials/vaccine inventory management, notifications management and work management. When integrated with the EHR, it facilitates the identification, management and control of infectious disease cases and outbreaks that pose a threat to the public’s health. | • Reduce risk of infectious diseases through immunization management  
• Improve control of infectious disease outbreaks, resulting in reduced fatalities  
• Increase speed and accuracy in detecting outbreaks, allowing more timely and appropriate intervention  
• Improve vaccine management  
• Improve coordination of infectious disease management | MESSAGING: HL7 V3.0  
TERMINOLOGY: HL7 Domain Tables, SNOMED CT, ICD-10-CA, CCI, pCLOCD (LOINC), UCUM | Messages are currently being refined in collaboration with the pan-Canadian reference solution (Panorama) development project. |

## BUSINESS FUNCTIONS

- Identify and monitor cases/outbreaks  
- Trace exposures and contacts  
- Forecast, record immunization and adverse reactions  
- Consent management  
- Distributed immunization management  

## MESSAGING & TERMINOLOGY

- HL7 V3.0  
- HL7 Domain Tables, SNOMED CT, ICD-10-CA, CCI, pCLOCD (LOINC), UCUM  

## STATUS

- Messages are currently being refined in collaboration with the pan-Canadian reference solution (Panorama) development project.

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# National e-Claims (NeCST) Standards
Enable electronic exchange of health financial data.

<table>
<thead>
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</table>
| National e-Claims standards represent the ability to electronically exchange health financial data. A national e-claims standard will lead to consistency and provide the foundation for claims information exchange throughout the health care industry. NeCST standards will provide support for electronic health records through consistent data capture and reporting. | • Reduce costs related to correcting manual errors and obtaining incomplete information  
• Reduce number of refused and partially paid claims  
• Reduce delay in payment of claim  
• Immediate access to claim status without staff intervention  
• Consistent electronic billing and reporting, regardless of payor | MESSAGING: HL7 V3.0  
TERMINOLOGY: HL7 Domain Tables, ICD-10-CA, CCI |  

## BUSINESS FUNCTIONS

- Provide electronic claims that can support various health care providers, including:  
  - Pharmacists  
  - Physiotherapists  
  - Dentists  
  - Optometrists  
  - Chiropractors  
  - Physicians
# Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCI</td>
<td>Canadian Classification of Health Interventions</td>
</tr>
<tr>
<td>CDA</td>
<td>Clinical Document Architecture</td>
</tr>
<tr>
<td>CPI</td>
<td>Consistent Presentation of Images</td>
</tr>
<tr>
<td>CTS</td>
<td>Clinical Terminology Services</td>
</tr>
<tr>
<td>DI</td>
<td>Diagnostic Imaging</td>
</tr>
<tr>
<td>DICOM</td>
<td>Digital Imaging and Communications in Medicine</td>
</tr>
<tr>
<td>DIR</td>
<td>Diagnostic Imaging Repository</td>
</tr>
<tr>
<td>EHR</td>
<td>Electronic health record</td>
</tr>
<tr>
<td>EHRI/EHRI</td>
<td>Electronic health record infostructure</td>
</tr>
<tr>
<td>EHRs</td>
<td>EHR Solution</td>
</tr>
<tr>
<td>FA</td>
<td>Formal Approval</td>
</tr>
<tr>
<td>HCDPD</td>
<td>Health Canada Drug Product Database</td>
</tr>
<tr>
<td>HIAL</td>
<td>Health Information Access Layer</td>
</tr>
<tr>
<td>HL7</td>
<td>Health Level 7</td>
</tr>
<tr>
<td>ICD-10-CA</td>
<td>Enhanced Canadian version of the 10th revision of the International Statistical Classification of Diseases and Related Health Problems</td>
</tr>
<tr>
<td>iEHR</td>
<td>Interoperable EHR</td>
</tr>
<tr>
<td>IHE</td>
<td>Integrating the Health care Enterprise</td>
</tr>
<tr>
<td>IHTSDO®</td>
<td>International Health Terminology Standards Development Organization</td>
</tr>
<tr>
<td>IRIS</td>
<td>Integrated Risk Information System</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
</tr>
<tr>
<td>ISO/TC 215</td>
<td>International Organization for Standardization (ISO) Technical Committee #215</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>JLIS</td>
<td>Jurisdictional Laboratory Information System</td>
</tr>
<tr>
<td>KIN</td>
<td>Key Image Note</td>
</tr>
<tr>
<td>LOINC®</td>
<td>Logical Observation Identifiers Names and Codes</td>
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<tr>
<td>NeCST</td>
<td>National e-Claim Standards</td>
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<tr>
<td>OIDS</td>
<td>Object Identifiers</td>
</tr>
<tr>
<td>PACS</td>
<td>Picture Archiving &amp; Communication Systems</td>
</tr>
<tr>
<td>pCLOCD</td>
<td>pan-Canadian Laboratory Observation Code Database</td>
</tr>
<tr>
<td>PDI</td>
<td>Portable Data for Imaging</td>
</tr>
<tr>
<td>PGP</td>
<td>Presentation of Grouped Procedures</td>
</tr>
<tr>
<td>PHS</td>
<td>Public Health Surveillance</td>
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<tr>
<td>PIR</td>
<td>Patient Information Reconciliation</td>
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<tr>
<td>POS</td>
<td>Point of Service</td>
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<tr>
<td>RIS</td>
<td>Radiology Information Systems</td>
</tr>
<tr>
<td>SDO</td>
<td>Standards Development Organization</td>
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<tr>
<td>SFU</td>
<td>Stable For Use</td>
</tr>
<tr>
<td>SHR</td>
<td>Shared Health Record</td>
</tr>
<tr>
<td>SNOMED-CT®</td>
<td>Systematized Nomenclature of Medicine Clinical Terms</td>
</tr>
<tr>
<td>SSS</td>
<td>Standards Strategy Selection</td>
</tr>
<tr>
<td>SWF</td>
<td>Scheduled Workflows</td>
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<tr>
<td>UCUM</td>
<td>Unified Codes for Unit of Measure</td>
</tr>
<tr>
<td>ULI</td>
<td>Unique Lifetime Identifier</td>
</tr>
<tr>
<td>UML</td>
<td>Unified Modeling Language</td>
</tr>
<tr>
<td>XDS-I</td>
<td>Cross-enterprise Document Sharing for Imaging</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Mark-up Language</td>
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</tbody>
</table>
“Today Canadians are demanding reforms in health services, and governments recognize that reliable health information is essential to effective reforms. Pan-Canadian standards are the cornerstone of meaningful health information in Canada. Electronic health information systems with pan-Canadian standards can be the next remarkable Canadian public policy achievement.”

DEPUTY MINISTER