pan-Canadian Patient Summary

PS-CA Interoperability Specifications

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Type: Trial Implementation

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Canada Health Infoway

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1 Introduction

The *pan-Canadian Patient Summary Interoperability Specification* is an implementable, testable specification, based on the IHE International Patient Summary (IPS) specification and the HL7 IPS Implementation Guide. It defines building blocks to create and share condition-independent and specialty-agnostic patient summaries, irrespective of the condition of the patient or the treatment sought or specialty of the provider delivering care. PS-CA building blocks are configurable to address necessary Canadian jurisdictional variances. A patient summary is a health record extract, at a point in time, comprised of a standardized collection of clinical and contextual information (retrospective, concurrent, prospective), including the minimum necessary and sufficient data to inform a patient's treatment at the point of care.

The PS-CA specifications, written in line with international best practices, contain the information necessary for an implementer to consume and develop the components necessary for creating, consuming and sharing a Patient Summary and may be applied to existing and new information systems.

2 Intended Audience

The intended audience of this document includes but is not limited to:

- Those interested in integrating healthcare information systems and workflows
- IT departments of healthcare institutions
- Technical staff of vendors participating in the IHE initiative
- Experts involved in standards development
- Software developers

3 Purpose

The purpose of this document is to address the following functionality:

- Address three PS-CA use cases,
- Provide a detailed set of requirements (including Actors, Transactions and References to specific profiles and standards),
- Describe the implementation patterns that enable the exchange of the PS-CA, and
- Describe the set of requirements that complement the set of IHE Profiles, pan-Canadian Interoperability Specifications (e.g. CA:FeX), and HL7 FHIR® Profiles required by the PS-CA specifications with Canadian-specific constraints.

4 Glossary of Terms and Acronyms

The following table provides a list of terms and acronyms that you may encounter throughout the pan-Canadian interoperability specifications (e.g. PS-CA, CA:FeX) and/or in the prototyping and validation information.

Term / Acronym	Meaning
ATNA	The Audit Trail and Node Authentication (ATNA) Profile specifies the foundational elements needed by all forms of secure systems: node authentication, user authentication, event logging (audit), and telecommunications encryption. It is also used to indicate that other internal security properties such as access control, configuration control, and privilege restrictions are provided. (Source: https://profiles.ihe.net/ITI/TF/Volume1/ch-9.html)
Author (e.g., PS-CA Author)	A health care provider who authors and/or curates clinical data (e.g. Patient Summary).
Business/Legal Interoperability Requirements	Requirements that enable independent organizations to execute a collaborative process or service.
Business Requirements: Non-Testable	Business requirements that are not directly traceable to an IHE profile in the PS-CA specifications (e.g., provided for consideration and to support and provide guidance to implementers of the PS-CA).
Business Requirements: Testable	Business requirements that are directly traceable to an IHE profile in the PS-CA specifications.
CA:FeX	The CA:FeX Interoperability Specifications (Canadian FHIR Exchange (CA:FeX)) seek to promote FHIR RESTful exchange patterns, developed by industry-leading FHIR standards that can be applied on top of an existing non-FHIR infrastructure just as easily as it can be applied on top of FHIR servers.
CA:FMT	Canadian Formatting Service (CA:FMT) is a Canadian Integration Specification that provides formatting support service. It provides support for transformation of documents between different formats (e.g. from FHIR to PDF, CDA, etc.).
CCDD	The Canadian Clinical Drug Data Set (CCDD) is the drug terminology for use in digital health solutions such as electronic prescribing in Canada.
Central Infrastructure	A Central Infrastructure collects health information from participating organizations and stores the information in a centralized place. The Infrastructure also provides access control. Typically, the Central Infrastructure is under jurisdictional control.

Term / Acronym	Meaning
Clinical Data Repository	A clinical data repository is built around the HL7® FHIR®standard used for storing clinical data.
Clinical Solution	Any combination of health information technology assets and processes that enables clinical data to be communicated, managed, and dispositioned between a Producer and a Consumer. Clinical Solutions can be comprised of various Producer and Consumer systems including: EMR, HIS, CIS, PHR, EHR or any combination of these systems.
Conformance Testing	Conformance testing is a formal process of assessment focused on ensuring clinical solutions and systems accurately implement a particular specification (e.g. PS-CA Specifications) by ensuring there is conformance to the stated parameters that are being claimed in the standard.
Consumer (e.g., PS-CA Consumer)	A health records system (e.g., EMR, HIS, CIS, PHR, Patient Portal or EHR) that enables access to or receipt of a clinical document (e.g. PS-CA) by an authorized health care provider or the subject of care/patient.
Cross Border, Scheduled Care	Scheduled care of a resident of Canada that is delivered in/by another country.
Cross Border, Unscheduled Care	Unscheduled care of a resident of Canada that is delivered in/by another country.
CT	The Consistent Time Integration Profile (CT) provides a means to ensure that the system clocks and time stamps of the many computers in a network are well synchronized. This profile specifies synchronization with a median error less than 1 second. This is sufficient for most purposes. (Source: https://profiles.ihe.net/ITI/TF/Volume1/ch-7.html)
DIN	A Drug Identification Number (DIN) is a computer-generated eight digit number assigned by Health Canada to a drug product prior to being marketed in Canada.
Document Repository (Local or Central)	A document repository is a shared storage space for clinical documents (Patient Summaries) that can be hosted locally (i.e., at the document producer) or at the HIE Central Infrastructure and can be accessed by authorized users.
DPD	The Drug Product Database (DPD) is used to find drugs authorized for sale by Health Canada. The DPD is updated nightly and includes availability of the drug in Canada.

Term / Acronym	Meaning
Electronic Health Record (EHR)	The EHR represents the Clinical Solution that contains a secure and private collection of a patient's health information in a digital format, which is shareable across different health care settings / clinical solutions that are integrated. The EHR facilitates better sharing and interpretation of health information among the health care professionals involved in the care of the patient. For example: • CareConnect is British Columbia's secure, view-only EHR solution. It offers healthcare providers access to an integrated, provincial view of patient-centric information available 24/7 to support the delivery of patient care. • HEALTHe NL is the Newfoundland & Labrador provincial EHR. HEALTHe NL will provide more accurate and reliable data to support improved health care delivery, decision-making and policy and create improved accountability, stability and efficiency in the provincial health care system. • Netcare is Alberta's name for all the projects related to the provincial EHR - a secure and confidential electronic system of Alberta patients' health information: a single, comprehensive, and integrated patient record. • Other clinical systems: In some health authorities, other clinical systems may act as an EHR, holding the patient summary information.
Extensible PS-CA Dataset	Extensible PS-CA Dataset: PS-CA content that can be extended for use in a PS-CA use case scenario that complements the primary PS-CA use cases. *Note: Extensible PS-CA Dataset refers to the addition of data domains such as Family History.
FHIR® Repository	A FHIR repository is a clinical data repository built around the HL7® FHIR® standard used for storing clinical data.
Gazelle	Gazelle is a suite of virtual tools, developed by IHE Europe used to support interoperability testing. Gazelle will allow jurisdictions and vendors an opportunity to validate the role they will be playing in an ecosystem and ensure they are able to satisfy the interoperability requirements. Gazelle offers several self-serve, self-test and innovation opportunities for jurisdictions and vendors to test their alignment to the represented integration profiles.
HCP	Health Care Provider
Health Information Access Layer (HIAL)	An interface specification for the EHR infostructure that defines service components, service roles, information model and messaging standards required for the exchange of EHR data and execution of interoperability profiles between EHR services. (Source:https://www.infoway-inforoute.ca/en/component/edocman/resources/technical-documents/391-ehrs-blueprint-v2-full ; Page.340)

Term / Acronym	Meaning
Health Information Exchange (HIE)	Electronic health information exchange (HIE) allows doctors, nurses, pharmacists, other health care providers and patients to appropriately access and securely share a patient's vital medical information electronically—improving the speed, quality, safety and cost of patient care. While electronic health information exchange cannot replace provider-patient communication, it can greatly improve the completeness of patients' records, (which can have a big effect on care), as past history, current medications and other information is jointly reviewed during visits. Appropriate, timely sharing of vital patient information can better inform decision making at the point of care and allow providers to avoid readmissions, avoid medication errors, improve diagnoses and decrease duplicate testing. (Source: https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/what-hie)
Health Records System	A health records system may include an electronic medical records system, a hospital information system, a clinical information system, an electronic health records system or a personal health records system. The term is broadly used to describe system actors that may produce and/or consume a PS-CA. Jurisdictional implementation patterns will determine which systems are used to create, access, consume and manage patient summaries.
HIS	Health Information System
Health Level 7 (HL7®)	Founded in 1987, HL7 is a not-for-profit standards developing organization dedicated to providing a comprehensive framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information that supports clinical practice and the management, delivery and evaluation of health services. (Source: http://www.hl7.org/about/index.cfm?ref=nav)
HL7® Fast Healthcare Interoperability Resources (FHIR®)	Expected to be a next generation standards framework created by HL7. FHIR® combines the best features of HL7's Version 2, Version 3 and product lines while leveraging the latest web standards and applying a tight focus on implementability. (Source: http://www.hl7.org/implement/standards/fhir/)
Information/ Semantic Interoperability Requirements	Requirements for syntax and semantics such that data exchanged between health record systems can be interpreted and the meaning of the data ascertained.

Term / Acronym	Meaning
Integrating the Healthcare Enterprise (IHE)	IHE is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. IHE promotes the coordinated use of established standards such as DICOM and HL7 to address specific clinical needs in support of optimal patient care. Systems developed in accordance with IHE communicate with one another better, are easier to implement, and enable care providers to use information more effectively. (Source: https://www.ihe.net/)
IHE Actor	IHE Actors are responsible for producing, managing and/or acting on information in the context of an IHE Profile (e.g., Primary Care Provider, EMR, EHR, etc.). (Source: https://wiki.ihe.net/index.php/Actors)
IHE Domain	IHE Domains are responsible for the development and maintenance of the IHE Technical Frameworks that document the Integration Profiles. Each Domain manages Integration Profiles in a particular part of healthcare (e.g., Virtual Care). (Source: https://wiki.ihe.net/index.php/Domains)
IHE Integration Profiles	IHE Integration Profiles provide a solution to the interoperability challenges which have arisen in daily clinical work, as described in the Use Cases. Integration Profiles include detailed technical specifications for the use and implementation of relevant standards thus ensuring an uninterrupted flow of information between different healthcare IT applications in support of the specific use case. The Profiles describe how healthcare IT systems can provide integrated support for a clearly defined workflow, each of which individually supports a clinical task within a specific clinical domain. IHE Profiles can be used for a step-by-step implementation of systems in different domains and the gradual building of interoperable eHealth applications. (Source: https://www.ihe-europe.net/about-us/faq)
IHE Transactions	IHE Transactions are interactions between actors that communicate the required information through standards-based messages (e.g., patient look-up query, send patient summary information, etc.). (Source: https://wiki.ihe.net/index.php/PCC_TF-1/About)
International Patient Summary (IPS)	The IPS is a a minimal, non-exhaustive set of data elements defined by ISO/EN 17269 and realized by HL7 in both CDA and FHIR. The IPS is a snapshot clinical document that can be used for planned or unplanned care of a person locally or across borders. It emphasizes the data required and the necessary conformance of the use cases for an international patient summary. (Source: https://wiki.ihe.net/index.php/International_Patient_Summary_(IPS))

Term / Acronym	Meaning
Interoperability	Interoperability enables information to flow seamlessly between different solutions and devices. When different parts of the health system are interoperable with each other, they can “speak the same language.” Interoperability improves continuity of care, collaboration between health providers and patient access to their health information. By breaking down data silos, it also reduces inefficiencies and redundancies within the health system. Connection, collaboration and communication have never been more important for the health system. Increased use of virtual care has highlighted the need for safe and efficient electronic sharing of information across the circle of care. Continuing to improve Canadian health care will necessitate work in interoperability — connected systems are healthier systems. For more information about interoperability, please visit Canada Health Infoway - Interoperability.
IUA	The Internet User Authorization (IUA) Profile provides support for authorizing network transactions when using HTTP RESTful transports. IHE has authorization profiles for the Web Services and SOAP based transactions, and this profile provides an authorization profile for the HTTP RESTful transactions. (Source: https://profiles.ihe.net/ITI/TF/Volume1/ch-34.html)
Local, Scheduled Care	Scheduled care of a resident of Canada that is delivered in/by the Canadian health care system. This includes care provided in federal, provincial and territorial jurisdictions, as well as cross-jurisdictional care.
Local, Unscheduled Care	Unscheduled care of a resident of Canada that is delivered in/by the Canadian health care system. This includes care provided in federal, provincial and territorial jurisdictions, as well as cross-jurisdictional care.
Longitudinal Electronic Health Record	A longitudinal electronic health record is a single comprehensive patient record comprised of data from numerous data sources across the healthcare continuum.
Medical Home	The College of Family Physicians of Canada describes the Medical Home as: "The Patient’s Medical Home (PMH) is a family practice defined by its patients as the place they feel most comfortable—most at home—to present and discuss their personal and family health and medical concerns. It is the central hub for the timely provision and coordination of a comprehensive menu of health and medical services patients need." To read more about the Patient's Medical Home, please visit The College of Family Physicians of Canada's published document, A Vision for Canada - Family Practice - The Patient's Medical Home.

Term / Acronym	Meaning
MHD	The Mobile access to Health Documents (MHD) Profile defines one standardized interface to health document sharing (a.k.a. an Application Programming Interface (API)) for use by mobile devices so that deployment of mobile applications is more consistent and reusable. (Source: https://profiles.ihe.net/ITI/MHD/index.html)
Patient Portal	A patient portal is a web-based access point that enables secure patient access to personal health information and other self-serve health IT services. For example, a patient portal can be hosted on an EMR solution.
Patient Proxy	An individual or entity that has the authority to act on behalf of a subject of care/ patient. Proxies can include parents of dependent children, parents of dependent adults, powers of attorney, etc.
Patient Summary-CA (PS-CA)	An electronic patient summary for use at the point of care comprised of, at minimum, the required elements of the Patient Summary-CA data set and specifications. The PS-CA is a health record extract, at a snapshot in time, comprised of a standardized collection of clinical and contextual information (retrospective, concurrent, prospective), including the minimum necessary and sufficient data to inform a patient's treatment at the point of care. The PS-CA is condition-independent and specialty-agnostic, irrespective of the condition of the patient or the treatment sought or specialty of the provider delivering care.
PDQm	The Patient Demographics Query for Mobile (PDQm) Profile defines a lightweight RESTful interface to a patient demographics supplier leveraging technologies readily available to mobile applications and lightweight browser based applications. (Source: https://profiles.ihe.net/ITI/TF/Volume1/ch-38.html)
PIXm	The Patient Identifier Cross-reference for Mobile (PIXm) Profile provides RESTful transactions for mobile and lightweight browser-based applications to create, update and delete patient records in a Patient Identifier Cross-reference Manager and to query the Patient Identifier Cross-reference Manager for a patient's cross-domain identifiers. (Source: https://profiles.ihe.net/ITI/TF/Volume1/ch-41.html)
PMIR	The Patient Master Identity Registry (PMIR) Profile supports the creating, updating and deprecating of patient master identity information about a subject of care, as well as subscribing to changes to the patient master identity, using the HL7 FHIR standard resources and RESTful transactions. (Source: https://www.ihe.net/uploadedFiles/Documents/ITI/IHE_ITI_Suppl_PMIR.pdf)
Producer (e.g., PS-CA Producer)	A health records system (e.g., EMR, HIS, CIS, PHR, or EHR) that creates/produces a clinical document (e.g. PS-CA) in response to a request from an authorized health care provider, the subject of care or another authorized health records system.

Term / Acronym	Meaning
Projectathon	A Projectathon is an important step and a best-practice approach in testing and validation of a specification package, where implementers collaborate to test their solutions using methodology and tools that accelerate interoperability. A Projectathon provides an opportunity for participants to test their systems among themselves and against a reference environment. It is also an opportunity to collaborate among peers to enable hands-on knowledge exchange.
PS-CA Solution	Any combination of health information technology assets and processes that enables a Patient Summary-CA to be created, communicated, managed and dispositioned between a PS-CA Producer and a PS-CA Consumer. Patient Summary-CA Solutions can be comprised of various Producer and Consumer systems including: EMR, HIS, CIS, PHR, EHR or any combination of these systems.
PS-CA Specifications	**pan-Canadian Patient Summary Interoperability Specifications:** The pan-Canadian Patient Summary Interoperability Specification is an implementable, testable specification, based on the IHE International Patient Summary specification and the HL7 IPS Implementation Guide. For more information on the PS-CA Specifications, please go here.
PT	Provinces and Territories
RA	The Reference Architecture (RA) is intended as an evolving blueprint of service availability that supports a broader interoperability landscape, not limited to patient summaries. Its purpose is to facilitate multi-stakeholder dialogue, collaboration and convergence towards common, open standards. It is a conceptual technical view that provides a common vocabulary and a set of actors and transactions representing typical components in a digital health ecosystem (public and private sector solutions). It is combination of building blocks adopted from international standards development bodies and Canadian developed implementation patterns.
SUT	System Under Test
SVCM	Sharing Valuesets, Codes and Maps (SVCM) defines a lightweight interface through which healthcare systems may retrieve centrally managed uniform nomenclature and mappings between code systems based on the HL7 Fast Healthcare Interoperability Resources (FHIR) specification. (Source: https://wiki.ihe.net/index.php/Sharing_Valuesets,_Codes_and_Maps_(SVCM))
Technical Interoperability Requirements	Requirements for one health record system to send data to another health record system and for the receiving system to acknowledge receipt of the data payload.
Terminology	Collection of uniquely identifiable concepts with associated representations, designations, associations and meanings.

Term / Acronym	Meaning
XDM	Cross-Enterprise Document Media Interchange (XDM) provides document interchange using a common file and directory structure over several standard media types. This permits the patient to use physical media to carry medical documents. This also permits the use of person-to-person email to convey medical documents. XDM supports the transfer of data about multiple patients within one data exchange. (Source: https://profiles.ihe.net/ITI/TF/Volume1/ch-16.html)
XDS	The Cross-Enterprise Document Sharing (XDS) IHE Integration Profile facilitates the registration, distribution and access across health enterprises of patient electronic health records. (Source: https://profiles.ihe.net/ITI/TF/Volume1/ch-10.html)

5 Preface

In support of the provinces and territories, Canada Health Infoway (Infoway) is facilitating a national collaborative effort to advance interoperability. While there are many interoperability-related challenges, these specifications address the challenge of sharing Patient Summaries.

A Patient Summary (PS) is a health record extract comprising a standardized collection of clinical and contextual information (retrospective, concurrent, prospective) that provides a snapshot in time of a subject of care's health information and health care, while a longitudinal health record is a single comprehensive patient record comprised of data from numerous data sources across the health care continuum.

Canada is not alone in trying to solve for this challenge. The International Patient Summary (IPS) project started in Europe several years ago and has been adopted by ISO, IHE and HL7 International. In addition, there is an active working group led by the Office of the National Coordinator (ONC) in the United States called the Global Digital Health Partnership (GDHP) actively working with its members on solutions for Patient Summary exchanges at an international scale. Canada is an active participant in this partnership. At the G7 meeting in June 2021, Canada committed to work with jurisdictions, vendors, and participating organizations to collaborate on a pan-Canadian implementable specification that aligns to the IPS and reflects Canada's jurisdictional realities. The overarching principle adopted for the Patient Summary-CA (PS-CA) project is to align as closely as possible to the IPS profiles. This principle will support jurisdictions in representing their clinical workflows and will support implementers in undergoing the necessary change management efforts required to support adoption activities, ensuring this work effort is a worthwhile investment.

In October 2021, the CHIEF Executive Forum, an influential Digital Health Canada member group, published a white paper, The Value of the International Patient Summary in Canada, providing an overview of IPS implementation globally, including lessons learned from other countries. Benefits and value to patients, clinicians, and the healthcare system are explored in the white paper and these lessons are translated into key themes for IPS in Canada, as well as a roadmap to successful implementation.

5.1 High-Level PS-CA Release Roadmap

The PS-CA Release Roadmap, as outlined in the table below, provides the current focus for the PS-CA, starting with supports for sharing Patient Summaries for local care with information from a single source. As the PS-CA journey unfolds, additional content will be added throughout the life of the PS-CA Roadmap to accommodate the requirements of Canada's implementers, such as the ability to consolidate Patient Summary information from multiple sources to create a single Patient Summary that can be exchanged internationally with target nations.

Jurisdiction	Expected User Scenarios	Expected Implementation	High-Level Roadmap
Local	• Patient Summary (PS) available for local care transitions (provider to provider) • Provider contributes summary data to provincial repository	• Sharing between providers' systems • EMR/HIS input to provincial PS repositories • Multiple data sources not reconciled/curated	Current Focus (AB, BC, MB, NL, ON, SK)

Jurisdiction	Expected User Scenarios	Expected Implementation	High-Level Roadmap
Provincial	• Patient/Provider consults a provincial summary • Provider updates local record from provincial summary • Patient contributes to Provincial summary	• Provincial repository consolidates and reconciles multiple sources of data to create a single Patient Summary	Future Focus (Subject to Change)
X-Provincial	• Patient/Provider able to consult a harmonized summary across provincial borders • Provider updates local record from cross-provincial summary	• Harmonized Patient Summary and data sets across provinces/ territories. Likely starting with a general subset evolving to support relevant specialties.	
International	• Patient able to access Patient Summary to receive care abroad • Foreign provider shares/consults summary for cross-national care, e.g., armed forces, extended stay outside Canada, etc.	• Patient Summary fully harmonized to support International exchange with target nations.	

5.2 PS-CA for Trial Implementation

The first PS-CA Trial Implementation release will include supports for sharing Patient Summaries for scheduled or unscheduled local care with information from a single source.

The PS-CA specifications implementation approach for alignment with the IPS will span a number of releases on a shared pan-Canadian interoperability roadmap. The first Trial Implementation release will focus on three use cases that have been identified as priority by the participating Canadian jurisdictions (i.e., Alberta (AB), British Columbia (BC), Ontario (ON), Saskatchewan (SK) and Newfoundland & Labrador (NL)) and their supporting business requirements, actors and transactions, terminology and FHIR® profiles. The following figure represents the:

- alignment of the PS-CA to the IPS-UV,
- data domains of interest by the participating Canadian jurisdictions (including Manitoba (MB), according to their Home Clinic Client Summary Service); and
- data domains included in the PS-CA specifications and data domains planned for future releases.

Patient Summary-CA: Data Domains of Interest by Canadian Jurisdiction and Release

	IPS-UV		PS- CA	AB	BC	MB	NL	ON	SK	v1.0.0 TI	Future
Header	Subject	Header	Subject								+
	Author		Author								+
	Attester		Attester								+
	Custodian		Custodian								+
Required	Medication Summary	Recommended	Medication Summary								+
	Allergies and Intolerances		Allergies and Intolerances								+
	Problem List		Problem List								+
Recommended	Immunizations		Immunizations								+
	History of Procedures		History of Procedures								+
	Medical Devices		Medical Devices								
	Diagnostic Results		Diagnostic Results								
Optional	Vital Signs	Optional	Vital Signs								+
	Past history of Illness		Past History of Illness								+
	Social History		Social History								+
	Advance Directives		Advance Directives								
	Pregnancy		Pregnancy								
	Functional Status		Functional Status								
	Plan of Care		Plan of Care								
		EXT	Extension(s)								
			Family History								+

Legend

- Blue: Header domains
- Red: Required domains
- Orange: Recommended domains
- Green: Optional domains
- Grey: Domains of interest by jurisdiction
- White: Domains not identified by jurisdictions as priority and/or not included in the PS-CA v1.0.0 TI release

5.3 Context

The PS-CA specifications are published to a public space within Canada Health Infoway's InfoScribe and are also available in downloadable PDF format. InfoScribe is a web-based tool developed for jurisdictions and vendors to create, publish, and collaborate on clinical requirements and specifications for interoperability solutions. Teams can document, share, and discuss content, files, ideas, specs, mock-ups, diagrams, and projects. A link to the online published content and the downloadable documentation will be published with each release of the PS-CA.

Release information for each release is contained in the corresponding PS-CA Release page.

New content will be added throughout the life of the PS-CA Roadmap to accommodate the requirements of Canada's implementers.

5.4 Introduction to IHE

Integrating the Healthcare Enterprise (IHE) is an international initiative to promote the use of standards to achieve interoperability among health information technology (HIT) systems, and the effective use of electronic health records (EHRs). IHE provides a forum for care providers, HIT experts and other stakeholders in several clinical and operational domains to reach consensus on standards-based solutions to critical interoperability issues.

The primary output of IHE are system implementation guides, called IHE profiles. IHE publishes each profile through a well-defined process of public review and Trial Implementation, and gathers profiles that have reached Final Text status into an IHE Technical Framework. These profiles are referenced in the Appendices of this document.

Preference for Modern HL7 FHIR interfaces

New implementation of IHE profiles based on the PS-CA should avoid legacy interfaces. IHE profiles that are HL7 FHIR based are preferred when available; however, the Reference Architecture will account for legacy systems that do not support FHIR. Canada Health Infoway will encourage the adoption of modern exchange protocols but will also provide the runway and opportunity for the jurisdictions to improve their interoperability capabilities.

For implementation patterns pertaining to HL7 FHIR Health Information Exchange (HIE) patterns, a new pan-Canadian Interoperability Specifications document has been developed (i.e., CA:FeX). More information about CA:FeX can be found in the Companion Guide: Reference Architecture of the PS-CA specifications and also in the pan-Canadian Interoperability CA:FeX pages here.

5.5 How to Read This Document

This document contains the following content, as well as informative appendices for your convenience.

- **Preface:** Contains an introduction to the pan-Canadian Patient Summary Interoperability Specifications. This section contains a summary of the context, document purpose and scope, as well as other content to help orient the first-time reader to the topic of these specifications and how they relate to other specifications in the digital health ecosystem in Canada.
- **PS-CA Use Case Overview:** Describes the Use Cases, including design constraints and assumptions and the flows of information that will be specified in the PS-CA specifications. This section also introduces scenarios that describe how the specified flows may be used in the Canadian context.
- **Core Interoperability Specifications:** Establishes the Core Interoperability Requirements for the PS-CA for two implementation options:
    - Document Repository/Registry Pattern (i.e., MHD - IHE Profile); and
    - FHIR Health Information Exchange (HIE) Pattern (i.e., CA:FeX).
- **PS-CA Actor Conformance:** Establishes the Conformance Requirements for the PS-CA specifications for the two implementation patterns identified above.
- **Privacy & Security Guidance:** Provides a reference to Infoway's recently published privacy primer, Privacy as an Enabler, that provides an introduction to interoperability, an overview of Canadian privacy laws and some practical approaches to privacy for interoperability. And, it provides a high-level list of security considerations for the PS-CA specifications.
- **Information Models, Applications and Infrastructure:** Provides key implementation guidance around Information Models, Applications and Infrastructure for the PS-CA specifications.
- **PS-CA Content Data Model & FHIR® Profiles:** Describes the required PS-CA Content Data Model & FHIR® Profiles.

5.6 Related Documents & References

The **pan-Canadian Patient Summary Interoperability Bundle** is the sole entry point for the technology developers, the compliance assessment testing and certification, and the purchasers of IT systems in terms of technical requirements.

The PS-CA specifications reference several supporting documents:

- **pan-Canadian Patient Summary – FHIR Implementation Guide**

  The pan-Canadian Patient Summary - FHIR Implementation Guide is an implementable, testable specification for the HL7 FHIR composition that defines the data payload of the PS-CA specifications, based on the HL7® FHIR® IPS implementation guide. It contains information for solution developers to implement the PS-CA content data model using the HL7® Fast Healthcare Interoperability Resources (FHIR®) standard. It describes the data elements & types, cardinality, constraints, and code system references - all of the details needed for two systems to be semantically interoperable with each other when a PS-CA compliant patient summary is exchanged.

  Target Audience: Solution Developers

- **pan-Canadian Patient Summary - Companion Guide to Use Cases & Definitions**

  The pan-Canadian Patient Summary - Companion Guide to Use Cases & Definitions is a companion document to the pan-Canadian Patient Summary Interoperability Specifications that presents the broader context for clinical, business, interoperability and solution development considerations that were discovered during the development of the PS-CA. It defines the healthcare problem that the PS-CA addresses and includes healthcare use cases and interoperability requirements in terms that will be traceable to the content in the pan-Canadian Patient Summary - Companion Guide to Reference Architecture, which defines the actors and their interactions with other actors and the pan-Canadian Patient Summary – FHIR Implementation Guide, which defines the contents and semantic interoperability of the PS-CA.

  This document will also support upcoming releases and roadmap elements of the PS-CA specifications.

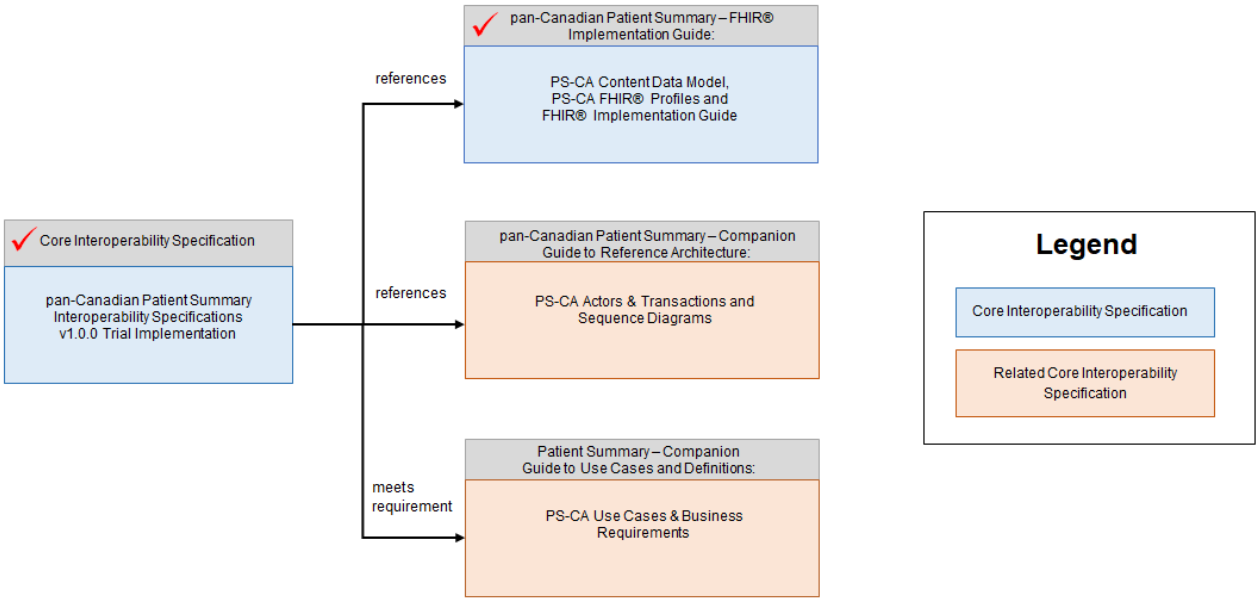
  Target Audience: CTOs, CMIOs, CIOs, PTs, Health Care Providers and vendors

- **pan-Canadian Patient Summary - Companion Guide to Reference Architecture**

  The pan-Canadian Patient Summary - Companion Guide to Reference Architecture contains background information on the abstracted PS-CA actors and transactions for the pan-Canadian Patient Summary Interoperability Specifications for stakeholders who are not familiar with the IHE Methodology. It describes baseline information on the recommended IHE profiles & pan-Canadian Interoperability Specifications and includes links to the Reference Architecture, available here: RA v0.1.1 DFT, where stakeholders can get additional details on each PS-CA actor and transaction. This document also includes descriptions of alternatives and choices for implementation patterns and ecosystem architectures to support the Patient Summary-CA in current state, including sequence diagrams that demonstrate the relationship and dependencies between the PS-CA actors and transactions.

  Target Audience: CTOs, CMIOs, CIOs, PTs and vendors

5.6.1 PS-CA Specifications Package



5.7 Document Conventions

The pan-Canadian Patient Summary Interoperability Specifications will be versioned according to the IO Specifications Publication Model, defined here.

5.8 Requirements Language

The following conventions are used to specify requirement levels for the business requirements within the specifications:

- **Shall:** used to indicate a **required** requirement.
- **Should:** used to indicate that a requirement is **recommended** and should be considered as best practice for implementation, but not required (i.e., it is optional) for implementation.
- **May:** used to indicate that a requirement is permittable / **optional**, but not required for implementation.
- **Shall not:** used to indicate that an element or action is prohibited.

Additional information on the PS-CA business requirements can be found in the Patient Summary – Companion Guide to Use Cases and Definitions.

5.9 Methodology

The Specifications have been co-developed with feedback and input from various jurisdictions and vendors collected during several months through Coordinating Table Meetings, Executive Table Meetings, stakeholder workshops and 1-on-1 meetings.

Stakeholders included clinicians, technical SMEs, and standards SMEs from participating jurisdictions (i.e., AB, ON, BC, SK, and NL), as well as vendors and software developers. The development of the PS-CA specifications rely on the business requirements set by the in-scope Use Cases of the PS-CA project. These high-level requirements are

not restated in the specifications. Stakeholders should review the Companion Guide: Use Cases and Definitions for this information.

5.10 Introduction to a Use-Case Driven Approach

The following use case-driven approach was utilized in the development of the pan-Canadian Patient Summary Interoperability Specifications:

- **Baseline:** Develop foundational Use Cases, Use Case Scenarios and Business Requirements for pan-Canadian Patient Summaries based on information provided by jurisdictions
- **Collaborate:** Collaborate with jurisdictions, clinical SMEs, technical SMES, vendors, participating organizations to develop and refine detailed artefacts
- **Review:** Review and provide feedback into artefacts through engagement workshops and input gathering
- **Publish:** Publish artefacts for broader stakeholder consultation
- **Recommend:** Recommend draft artefacts for approval
- **Iterate:** Continue to refine as per testing and priorities

5.11 Release Cycle

The PS-CA specifications' release cycle includes a multi-stage review and feedback process. For more information, please visit the pan-Canadian Interoperability PS-CA Release Information page.

6 PS-CA Use Case Overview

6.1 PS-CA Use Case Overview

This section describes the three pan-Canadian Use Cases, including all design constraints and assumptions as well as the flows of information that will be specified in this specification. This section also introduces the scenarios that describe how the specified workflows may be used in the Canadian eHealth context.

6.2 In-Scope

Stakeholder engagement has identified 3 prioritized common use cases for Release 1. These use cases are aligned within the participating jurisdictions and are in-scope of the PS-CA project:

PS-CA Use Cases In-Scope for Release 1	AB	BC	NL	ON	SK
1) Health Care Provider (HCP) Creates a Patient Summary-CA	x	x	x	x	x
2) Health Care Provider (HCP) Views and Uses a Patient Summary-CA	x	x	x	x	x
3) Patient Accesses and Views their Patient Summary-CA	x	x	x	x	

Additionally, all the business requirements of the pan-Canadian Patient Summary Interoperability Specifications that are testable in Release 1 are in-scope. More information on this can be found in the Patient Summary – Companion Guide to Use Cases and Definitions.

6.3 Out-of-Scope

The following Use Cases are not in-scope for this release and will be addressed in future releases.

PS-CA Use Cases Out-of-Scope:

- Healthcare Provider (HCP) Sends a Patient Summary-CA to another Healthcare Provider (HCP) as part of a Clinical Workflow (e.g., eReferral)
- Patient Presents Patient Summary-CA to Healthcare Provider (HCP) in Another Jurisdiction
- Healthcare Provider (HCP) requests Patient Summary-CA on Demand

In addition, all the business requirements of the pan-Canadian Patient Summary Interoperability Specifications that are not testable in Release 1 are out-of-scope. More information on this can be found in the Patient Summary – Companion Guide to Use Cases and Definitions.

6.4 Use Case Actors and Services

The Use Case Actors and the Services that are used by this specification for sharing Patient Summaries are described at a functional level in the Patient Summary – Companion Guide to Use Cases and Definitions. Stakeholders who wish to understand the mapping of Use Case Actors to business requirements and recommended IHE Profiles are recommended to read the pan-Canadian Patient Summary – Companion Guide to Use Cases and

Definitions and the pan-Canadian Patient Summary – Companion Guide to Reference Architecture. A summary is provided in the following tables:

Use Case Actors and Descriptions

Actor Name	Description / Definition
PS-CA Producer	A health records system (e.g., EMR, HIS, CIS, PHR, or EHR) that creates/produces a Patient Summary-CA in response to a request from an authorized health care provider, the subject of care or another authorized health records system.
PS-CA Consumer	A health records system (e.g., EMR, HIS, CIS, PHR, or EHR) that enables access to or receipt of a Patient Summary-CA by an authorized health care provider or the subject of care/patient.
Document Repository (Local or Central)	A document repository is a shared storage space for clinical documents (e.g., Patient Summaries) that can be hosted locally or at the Central Infrastructure and can be accessed by authorized users.
Central Infrastructure	A Central Infrastructure collects health information from participating organizations and stores the information in a centralized place. The Infrastructure also provides access control. Typically, the Central Infrastructure is under jurisdictional control.
Patient Portal	A patient portal is a web-based access point that enables secure patient access to personal health information and other self-serve health IT services. ***Note:** Patient Portal is also comparable to the PS-CA Consumer role; however, for Use Case 3, the Patient Summary is viewed by the subject of care.

Note: A system may assume more than one of the Actor roles defined in the Use Case Actors and Descriptions table.

Use Case Actor Mapping

Actor Name	UC-01	UC-02	UC-03
PS-CA Producer	x		x
PS-CA Consumer		x	
Document Repository (Local or Central)	x	x	x
Central Infrastructure	x	x	x
Patient Portal			x

6.5 Design Constraints & Assumptions

The following design constraints and assumptions exist for this release:

- All Use Case Actors/Users are logged in to the system. The Use Case Actors/Users are authenticated and appropriately authorized for all data exchange transactions.
    - For specific Canadian implementation guidance on IHE profiles (e.g. IUA), refer to the RA v0.1.1 DFT.
- PS-CA is created from local data sources.
    - There may be exceptions to the data source of some of the data domains of the Patient Summary-CA across jurisdictions in Canada. For example, for some jurisdictions, the immunization data will be pulled from the provincial immunization repository.
- The implementation patterns in-scope will be based on the MHD IHE Profile or CA:FeX Interoperability Specifications that are being developed for FHIR Health Information Exchange (HIE) Pattern. Additional details about these profiles can be found in the pan-Canadian Patient Summary – Companion Guide to Reference Architecture.

Additional information on design constraints and assumptions can be found in the pan-Canadian Patient Summary – Companion Guide to Use Cases and Definitions.

7 Core Interoperability Specification Requirements

7.1 Actor Mapping to Interoperability Specification

The Use Case Actors and the Services they support are described at a functional level in the Patient Summary – Companion Guide to Use Cases and Definitions. Services may be Recommended or Optional. The Use Case Actors, Services and Optionality are conveyed in the first three columns of Tables 1 to 3 in the section below. The second part of the table (columns 4-6) provides the mapping of the Use Case Actor to the detailed specifications (such as IHE Profiles, Technical Actors, Optionality) that systems shall implement to exchange healthcare information in the context of these Use Cases. The purpose of the tables below is to map the use case actors to the technical actors and the services they are supporting. These tables are aligned with the flow captured in the sequence diagrams which are included in the Companion Guide: Reference Architecture section.

For a selected Use Case Actor (columns 1-3), the system shall implement all the requirements (some optionality when allowed) listed in the second part of the table (columns 4-6). This includes the referenced healthcare profiles, the standards specified and terminology standards. For Technical Actors, which map to IHE Profiles or pan Canadian Interoperability Specifications (*MHD, PDQm, PMIR, CA:FeX, etc.*), refer to the Reference Architecture RA v0.1.1 DFT. Additionally, there are two implementation options defined in this specification (MHD and CA:FeX), which may be used to solve for the use cases outlined in the tables below.

The following interoperability requirement tables are categorized by options for implementation patterns that jurisdictions may choose based on their maturity, capabilities and current state:

1. Document Repository/Registry Pattern using MHD
2. FHIR Health Information Exchange (HIE) Pattern using CA:FeX

Published Versions

This is an evolving specification, the release cycle assumes some degree of change will happen across versions. Versions of the artefacts that are employed by the PS-CA Specifications will be clearly defined and align to testing requirements. For information about the supported versions of the in scope IHE Profiles that have been referenced in this PS-CA Specification refer to the Reference Architecture RA v0.1.1 DFT.

Legend

R = Required

O = Optional

7.2 Table 1.1 Interoperability Conformance Requirements for Use Case 1: HCP Creates PS-CA

Option 1: Document Repository/Registry Pattern

PS-CA USE CASE 1: HCP Creates PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
PS-CA Producer	Authenticate User	O	Client (e.g., EMR)	O	Internet User Authorization (IUA)
	Identify Patient	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System
		O	Patient Demographic Consumer	O	PDQm
	Retrieve clinical data from local data sources (Patient Identifier)	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
	Assemble and review Patient Summary	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
	Update Current Valuesets and ConceptMaps	O	Client (e.g., EMR)	O	SVCM
	Omit or Mask Data based on Jurisdictional Policy	O	Client (e.g., EMR)	O	Jurisdictional Requirement
	Save PS-CA to Document Repository	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
		R	Document Source	R	MHD
Document Repository (Local to PS-CA Producer or Central)	Save PS-CA to Document Repository	R	Document Recipient	R	MHD

PS-CA USE CASE 1: HCP Creates PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
Central Infrastructure	Identify Patient	O	Patient Identity Registry	O	PMIR

7.3 Table 1.2 Interoperability Conformance Requirements for Use Case 1: HCP Creates PS-CA

Option 2: FHIR Health Information Exchange (HIE) Pattern

PS-CA USE CASE 1: HCP Creates PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
PS-CA Producer	Authenticate User	O	Client (e.g., EMR)	O	Internet User Authorization (IUA)
	Identify Patient	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System
		O	Patient Demographic Consumer	O	PDQm
	Retrieve clinical data from local data sources (Patient Identifier)	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
	Assemble and review Patient Summary	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
	Update Current Valuesets and ConceptMaps	O	Client (e.g., EMR)	O	SVCM

PS-CA USE CASE 1: HCP Creates PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
	Omit or Mask Data based on Jurisdictional Policy	O	Client (e.g., EMR)	O	Jurisdictional Requirement
	Save PS-CA to Document Repository	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
		R	Data Source	R	CA:FeX
Document Repository (Central)*	Save PS-CA to Document Repository	R	Data Recipient	R	CA:FeX
Central Infrastructure	Identify Patient	O	Patient Identity Registry	O	PMIR

*For Option 2, **Document Repository** use case actor is a logical role enacted by the Data Recipient which is described in detail in the 'Companion Guide: Reference Architecture'.

7.4 Table 2.1 Interoperability Conformance Requirements for Use Case 2: HCP Views/ Consumes PS-CA

Option 1: Document Repository/Registry Pattern

PS-CA USE CASE 2: HCP Views/ Consumes PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTORS	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
PS-CA Consumer	Authenticate User	O	Client (e.g., EMR)	O	Internet User Authorization (IUA)
	Identify Patient	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System

PS-CA USE CASE 2: HCP Views/ Consumes PS-CA			**MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS**		
USE CASE ACTORS	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
		O	Patient Demographic Consumer	O	PDQm
	Request Patient Summary References (Patient Identifier)	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
	Request Patient Summary (Patient Summary References)	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
	Return Patient Summary References	R	Document Consumer	R	MHD
	Return Patient Summary	R	Document Consumer	R	MHD
	Perform transformation between different formats	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System (Render to Specific Format (PDF))
		O	Client (e.g., EMR)	O	CA:FMT (e.g., FHIR to CDA, Export to PDF, etc.)
	Download/Print PS-CA	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System
	Update Current ValueSets and ConceptMaps	O	Client (e.g., EMR)	O	SVCM

PS-CA USE CASE 2: HCP Views/ Consumes PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTORS	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
Document Repository (Local to PS-CA Producer or Central)	Retrieve PS-CA References from Document Repository	R	Document Responder	R	MHD
	Retrieve PS-CA from Document Repository	R	Document Responder	R	MHD
Central Infrastructure	Identify Patient	O	Patient Identity Registry	O	PMIR

7.5 Table 2.2 Interoperability Conformance Requirements for Use Case 2: HCP Views/ Consumes PS-CA

Option 2: FHIR Health Information Exchange (HIE) Pattern

PS-CA USE CASE 2: HCP Views/ Consumes PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE/ STANDARD
PS-CA Consumer	Authenticate User	O	Client (e.g., EMR)	O	Internet User Authorization (IUA)
	Identify Patient	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System
		O	Patient Demographic Consumer	O	PDQm
	Request Search Patient Summary (Patient Identifier)	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System

PS-CA USE CASE 2: HCP Views/ Consumes PS-CA			**MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS**		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE/ STANDARD
	Request Patient Summary (Bundle ID)	R	Client (e.g., EMR)	R	Use Existing Standards Employed by the Clinical System
	Return Patient Summary Compositions	R	Data Consumer	R	CA:FeX
	Return Patient Summary	R	Data Consumer	R	CA:FeX
	Perform transformation between different formats	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System (Render to Specific Format (PDF))
		O	Client (e.g., EMR)	O	CA:FMT (e.g., FHIR to CDA, CDA to FHIR, Export to PDF, etc.)
	Download/Print PS-CA	O	Client (e.g., EMR)	O	Use Existing Standards Employed by the Clinical System
	Update Current ValueSets and ConceptMaps	O	Client (e.g., EMR)	O	SVCM
Document Repository (Local to PS-CA Producer or Central)*	Retrieve Patient Summary Compositions From Document Repository	R	Data Responder	R	CA:FeX
	Retrieve Patient Summary Bundle Document Repository	R	Data Responder	R	CA:FeX
Central Infrastructure	Identify Patient	O	Patient Identity Registry	O	PMIR

*For Option 2, **Document Repository** use case actor is a logical role enacted by the Data Recipient which is described in detail in the 'Companion Guide: Reference Architecture'.

7.6 Table 3.1 Interoperability Conformance Requirements for Use Case 3: Patient Views/Consumes PS-CA

Option 1: Document Repository/Registry Pattern

PS-CA USE CASE 3: Patient Views/ Consumes PS-CA			**MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS**		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
Patient Portal	Authenticate User	O	Client App	O	Internet User Authorization (IUA)
	Identify Patient	O	Client App	O	Use Existing Standards Employed by the Clinical System
		O	Patient Demographic Consumer	O	PDQm
	Request Patient Summary References (Patient Identifier)	R	Client App	R	Use Existing Standards Employed by the Clinical System
	Request Patient Summary (Patient Summary References)	R	Client App	R	Use Existing Standards Employed by the Clinical System
	Return Patient Summary References	R	Document Consumer	R	MHD
	Return Patient Summary	R	Document Consumer	R	MHD
	Perform transformation between different formats	O	Client App	O	Use Existing Standards Employed by the Clinical System (Render to Specific Format (PDF))

PS-CA USE CASE 3: Patient Views/ Consumes PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
		O	Client App	O	CA:FMT (e.g., FHIR to CDA, Export to PDF, etc.)
	Download/Print PS-CA	O	Client App	O	Use Existing Standards Employed by the Clinical System
	Save to Portable Media	O	Client App	O	Use Existing Standards Employed by the Clinical System
		O	Portable Media Creator	O	XDM (Future scope)
Document Repository (Local or Central)	Retrieve PS-CA References from Document Repository	R	Document Responder	R	MHD
	Retrieve PS-CA from Document Repository	R	Document Responder	R	MHD
Central Infrastructure	Identify Patient	O	Patient Identity Registry	O	PMIR

7.7 Table 3.2 Interoperability Conformance Requirements for Use Case 3: Patient Views/Consumes PS-CA

Option 2: FHIR Health Information Exchange (HIE) Pattern

PS-CA USE CASE 3: Patient Views/ Consumes PS-CA			MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
Patient Portal	Authenticate User	O	Client App	O	Internet User Authorization (IUA)

PS-CA USE CASE 3: Patient Views/ Consumes PS-CA			**MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS**		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
	Identify Patient	O	Client App	O	Use Existing Standards Employed by the Clinical System
		O	Patient Demographic Consumer	O	PDQm
	Request Search Patient Summary (Patient Identifier)	R	Client App	R	Use Existing Standards Employed by the Clinical System
	Request Patient Summary (Bundle ID)	R	Client App	R	Use Existing Standards Employed by the Clinical System
	Return Patient Summary Compositions	R	Data Consumer	R	CA:FeX
	Return Patient Summary	R	Data Consumer	R	CA:FeX
	Perform transformation between different formats	O	Client App	O	Use Existing Standards Employed by the Clinical System (Render to Specific Format (PDF))
		O	Client App	O	CA:FMT (e.g., FHIR to CDA, CDA to FHIR, Export to PDF, etc.)
	Download/Print PS-CA	O	Client App	O	Use Existing Standards Employed by the Clinical System
	Save to Portable Media	O	Client App	O	Use Existing Standards Employed by the Clinical System
		O	Portable Media Creator	O	XDM (Future scope)

PS-CA USE CASE 3: Patient Views/ Consumes PS-CA			**MAPPING TO SECTIONS FROM THIS AND REFERENCED INTEROPERABILITY SPECIFICATIONS**		
USE CASE ACTOR	SERVICE SUPPORTED	OPT	TECHNICAL ACTOR	OPT	PROFILE / STANDARD
Document Repository (Local or Central)*	Retrieve Patient Summary Compositions from Document Repository	R	Data Responder	R	CA:FeX
	Retrieve Patient Summary Bundle from Document Repository	R	Data Responder	R	CA:FeX
Central Infrastructure	Identify Patient	O	Patient Identity Registry	O	PMIR

*For Option 2, **Document Repository** use case actor is a logical role enacted by the Data Recipient which is described in detail in the 'Companion Guide: Reference Architecture.'

8 PS-CA Actor Conformance

A system conforming to this Core Interoperability Specification shall claim conformance at the level of a Use Case Actor (first columns of Tables 1.1, 1.2, 2.1, 2.2, 3.1 and 3.2). A system may claim conformance to one or more Use Case Actors among:

- PS-CA Producer
- PS-CA Consumer
- Document Repository (Local or Central)
- Central Infrastructure
- Patient Portal

PS-CA Producer and PS-CA Consumer use case actor roles will primarily be taken up by EMR clinical solution vendors. Document Repository and Central Infrastructure use case actor roles can be taken up either by EMR clinical solution vendors or jurisdictions depending on the implementation approach that the jurisdiction decides to adopt. Similarly, the Patient Portal use case actor can be taken up either by a vendor or jurisdiction depending on the approach and policies defined regarding patient/subject-of-care access to their patient summary.

In order to implement a system that fully supports the pan-Canadian Patient Summary Interoperability Specifications, the system shall be able to claim conformance to 'Required' services and it's associated requirements as defined in Core Interoperability Specification Requirements.

8.1 OpenAPI Specification

It is recommended to use the OpenAPI UI to access the interactive API documentation. The API allows developers to test API calls directly in the browser. There are two APIs:

- OpenAPI for MHD: available here
- Open API for CA:FeX: available here

8.2 Constraints on PS-CA Use Case Actors Using Two Implementation Patterns

The pages that follow will describe the constraints on PS-CA Use Case Actors for two implementation patterns below:

1. Option 1 - Document Repository/Registry Pattern Using MHD Profile
2. Option 2 - FHIR Health Information Exchange (HIE) Pattern Using CA:FeX

8.3 Option 1 - Document Repository/Registry Pattern Using MHD Profile

8.3.1 Constraints on PS-CA Use Case Actors: Option 1 - Document Repository/ Registry Pattern Using MHD Profile

There are some design constraints on use case actors when developing functionality to support the services mapped to those Use Case Actors.

Note: The scope of this section is limited to the constraints that are applicable to IHE MHD profile actors and transactions. The two key services supported by the IHE MHD Profile are:

- Save PS-CA to Document Repository
- Retrieve PS-CA from Document Repository

This section provides key design constraints for implementation of these two required services using IHE methodology and FHIR standards.

8.3.2 Save PS-CA to Document Repository

The *Save PS-CA to Document Repository* service shall be implemented using PS-CA Producer and Document Repository Use Case Actors.

These actors shall use the IHE Transaction **Provide Document Bundle [ITI-65]** of the MHD profile that passes a *Provide Document Bundle Request* from a Document Source to a Document Recipient.

Provide Document Bundle [ITI-65]

This message uses the HTTP POST method on the target Provide Document Bundle endpoint to convey the metadata and the document(s) as a FHIR transaction.

Trigger Events

This method is invoked when the Document Source needs to submit one or more documents to a Document Recipient.

Message Semantics

The Document Source shall initiate a FHIR "transaction" using a "create" action by sending an HTTP POST request method composed of a FHIR Bundle Resource. The media type of the HTTP body shall be either application/fhir+json or application/fhir+xml.

Expected Actions

The Document Recipient shall accept both media types application/fhir+json and application/fhir+xml. On receipt of the submission, the Document Recipient shall validate the resources and respond with one of the HTTP codes defined in the response Message Semantics.

Refer to the Provide Document Bundle [ITI-65] transaction details page for additional information.

8.3.3 Retrieve PS-CA from Document Repository

The *Retrieve PS-CA from Document Repository* service shall be implemented using the PS-CA Consumer and Document Repository Use Case Actors.

These actors shall use the following IHE Transactions of the MHD profile to find document references, document lists and retrieval of an identified Patient Summary document:

- **Find Document Lists [ITI-66]**
- **Find Document References [ITI-67]**
- **Retrieve Document [ITI-68]**

Find Document List [ITI-66]

This message uses the search method parameterized query to obtain List Resources from the Document Responder.

Trigger Events

When the Document Consumer needs to discover List Resources matching various metadata parameters it issues a Find Document Lists message.

Message Semantics

The Document Consumer executes an HTTP search against the Document Responder List endpoint. The search target follows the FHIR HTTP specification, addressing the List Resource http://hl7.org/fhir/R4/http.html:

[base]/List?<query>

This URL is configurable by the Document Responder and is subject to the following constraints:

- The <query> represents a series of encoded name-value pairs representing the filter for the query as well as control parameters to modify the behavior of the Document Responder such as response format, or pagination.
- The Document Consumer may use GET or POST based searches. The Document Responder shall support both GET and POST based searches http://hl7.org/fhir/R4/http.html#search.

Query Search Parameters

The Document Consumer may supply, and the Document Responder shall be capable of processing all query parameters listed below. All query parameter values shall be appropriately encoded per RFC3986 “percent” encoding rules. Note that percent encoding does restrict the character set to a subset of ASCII characters which is used for encoding all other characters used in the URL.

- The Document Consumer shall include search parameters patient or patient.identifier, code, and status. The other parameters described below are optional.
- The Document Responder shall implement the parameters described below. The Document Responder may choose to support additional query parameters beyond the subset listed below. Any additional query parameters supported shall be supported according to the core FHIR specification. Such additional parameters are considered out of scope for this transaction. Any additional parameters not supported should be ignored and shall not cause a failure.

Query Search Parameters	Description
code	This parameter, of type token, specifies the code.coding value supplied in the List Resource. The value of the code element indicates the List of type SubmissionSet or Folder as indicated.
date	This parameter, of type date, specifies the time when the List was created. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.
designationType	This IHE extension on parameters defined as List-DesignationType, of type token, specifies the designation type of the List. The value of the designation type element expresses contentType of submissionSet or the codeList of a Folder. It is usually expressed in LOINC or SNOMED CT. Note that servers that do not support this extended search parameter will ignore it, and thus return more results than expected.
identifier	This parameter, of type token, specifies an identifier for this List. The search results represent the results of a search on List.masterIdentifier and List.identifier. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the token search parameter type.
patient	This parameter is of type Reference(Patient). The Document Consumer may get this reference through the use of the PDQm or PIXm Profiles, or by some other method. When the patient parameter is used, the Patient reference would need to be accessible to both the Document Consumer and the Document Responder.

<table>
<tr><th>Query Search Parameters</th><th>Description</th></tr>
<tr><td>patient.identifier</td><td>This parameter, of type token, specifies an identifier associated with the patient to which the List Resource is assigned. This use of patient.identifier follows the FHIR Chaining Parameters search methodology.</td></tr>
<tr><td>source.given and source.family</td><td>These parameters, of type string, specify the name parts of the author person which is associated with the List. This use of source.given and source.family follows the FHIR Chaining Parameters search methodology.</td></tr>
<tr><td>sourceId</td><td>This IHE extension on parameters defined as List-SourceId, of type reference, specifies the source (author) value supplied in the List Resource.</td></tr>
<tr><td>status</td><td>This parameter, of type token, specifies the status of the List. If included in the query, the Document Consumer shall populate the code portion of the token with one of the codes in the below table for status of List. The system portion of the token shall not be populated.
<table>
<tr><th>Code</th><th>ebRIM Code</th></tr>
<tr><td>Current</td><td>urn:oasis:names:tc:ebxml-regrep:StatusType:Approved</td></tr>
<tr><td>Superseded</td><td>urn:oasis:names:tc:ebxml-regrep:StatusType:Deprecated</td></tr>
</table>
</td></tr>
</table>

Expected Actions

The Document Responder shall process the query to discover the List entries that match the search parameters given.

Refer to the Find Document Lists [ITI-66] transaction details page for additional information.

Find Document References [ITI-67]

This message uses the search method parameterized query to obtain DocumentReference Resources from the Document Responder.

Trigger Events

When the Document Consumer needs to discover DocumentReference Resources matching various metadata parameters, it issues a Find Document References message.

Message Semantics

The Document Consumer executes an HTTP search against the Document Responder's DocumentReference URL. The search target follows the FHIR HTTP specification, addressing the DocumentReference Resource http://hl7.org/fhir/R4/http.html:

[base]/DocumentReference?<query>

This URL is configurable by the Document Responder and is subject to the following constraints:

- The <query> represents a series of encoded name-value pairs representing the filter for the query, as specified in Section Query Search Parameters, as well as control parameters to modify the behavior of the Document Responder such as response format, or pagination.
- The Document Consumer may use GET or POST based searches. The Document Responder shall support both GET and POST based searches http://hl7.org/fhir/R4/http.html#search.

Query Search Parameters

The Document Consumer may supply, and the Document Responder shall be capable of processing, all query parameters listed below. All query parameter values shall be appropriately encoded per RFC3986 "percent" encoding rules. Note that percent encoding does restrict the character set to a subset of ASCII characters which is used for encoding all other characters used in the URL.

- The Document Consumer shall include search parameters patient or patient.identifier, and status. The other parameters described below are optional.
- The Document Responder must implement the parameters described below. The Document Responder may choose to support additional query parameters beyond the subset listed below. Any additional query parameters supported shall be supported according to the core FHIR specification. Such additional parameters are considered out of scope for this transaction. Any additional parameters not supported should be ignored and shall not cause a failure.

Query Search Parameters	Description
author.given and author.family	These parameters, of type string, specify the name parts of the author person, which is associated with the DocumentReference Resource, or in Document Sharing nomenclature, the author of the Document Entry. This use of author.given and author.family follows the FHIR Chaining Parameters search methodology.
category	This parameter, of type token, specifies the general classification of the DocumentReference Resource, or in Document Sharing nomenclature, the classCode of the Document Entry.
creation	This IHE defined parameter defined as DocumentReference-Creation, of type dateTime, specifies a search against the DocumentReference.content.attachment.creation. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.
date	This parameter, of type date, specifies the time when the DocumentReference was created. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.
event	This parameter, of type token, specifies the main clinical acts documented by the DocumentReference Resource, or in Document Sharing nomenclature, the eventCodeList of the Document Entry.
facility	This parameter, of type token, specifies the kind of facility found in DocumentReference.context.facilityType, or in Document Sharing nomenclature, the healthcareFacilityTypeCode of the Document Entry.

Query Search Parameters	Description
format	This parameter, of type token, specifies the format of the DocumentReference Resource, or in Document Sharing nomenclature, the formatCode of the Document Entry.
identifier	This parameter, of type token, specifies an identifier for this DocumentReference and/or the contained document. The search results represent the results of a search on DocumentReference.masterIdentifier and DocumentReference.identifier.
patient	This parameter is of type Reference(Patient). The Document Consumer may get this reference using the PDQm or PIXm Profile. When the patient parameter is used, the Patient reference would need to be accessible to both the Document Consumer and the Document Responder.
patient.identifier	This parameter, of type token, specifies an identifier associated with the patient to which the DocumentReference Resource is assigned. This use of patient.identifier follows the FHIR Chaining Parameters search methodology.
period	This parameter, of type date, represents the time of service that is being documented by the DocumentReference. The period search parameter specifies an interval which the time of service overlaps. In Document Sharing nomenclature, this query parameter represents from/to parameters for the serviceStartTime and serviceStopTime of the Document Entry. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.
related	This parameter, of type reference, represents other identifiers associated with the DocumentReference Resource, or in Document Sharing nomenclature, the referenceIdList of the Document Entry.
security-label	This parameter, of type token, specifies the security labels of the document referenced by the DocumentReference Resource, or in Document Sharing nomenclature, the confidentialityCode of the Document Entry.
setting	This parameter, of type token, specifies the specific practice setting of the DocumentReference Resource, or in Document Sharing nomenclature, the practiceSettingCode of the Document Entry.

<table>
<tr><th>Query Search Parameters</th><th>Description</th></tr>
<tr><td>status</td><td>This parameter, of type token, specifies the status of the DocumentReference Resource, or in Document Sharing nomenclature, the availabilityStatus of the Document Entry. The Document Consumer shall populate the identifier portion of the token using one of the FHIR Codes in below table. The system portion of the token shall not be populated.
<table>
<tr><th>FHIR Code</th><th>ebRIM Code</th></tr>
<tr><td>Current</td><td>urn:oasis:names:tc:ebxml-regrep:StatusType:Approved</td></tr>
<tr><td>Superseded</td><td>urn:oasis:names:tc:ebxml-regrep:StatusType:Deprecated</td></tr>
</table>
</td></tr>
<tr><td>type</td><td>This parameter, of type token, specifies the specific type of the DocumentReference resource or in Document Sharing nomenclature, the typeCode of the Document Entry. See ITI TF-2x: Appendix Z.2 for additional constraints on the use of the token search parameter type.</td></tr>
</table>

Expected Actions

The Document Responder shall process the query to discover the DocumentReference entries that match the search parameters given.

Refer to the Find Document References [ITI-67] transaction details page for additional information including the ***Find Document References Response Message.***

Retrieve Document [ITI-68]

This transaction is used by the Document Consumer to retrieve a document from the Document Responder.

Trigger Events

The Document Consumer wants to obtain a document.

Message Semantics

The Document Consumer sends an HTTP GET request to the server. The Document Consumer request may be to retrieve the document content referenced by a DocumentReference.content.attachment.url.

The Document Consumer may provide an HTTP Accept header, according to the semantics of the HTTP protocols. This enables the Document Consumer to indicate preferred mime-types such that the Document Responder could provide the document requested in an encoding other than the encoding indicated in the DocumentReference. For example, indicating application/fhir+json could result in the response from the Document Responder being a JSON FHIR Bundle of type document with all the content encoded as FHIR resources.

The only MIME type assured to be returned is the MIME type indicated in the DocumentReference.content.attachment.contentType.

The HTTP If-Unmodified-Since header shall not be included in the GET request.

Expected Actions

The Document Responder shall provide the document in the requested MIME type or reply with an HTTP status code indicating the error condition. The Document Responder is not required to transform the document.

Refer to the Retrieve Document [ITI-68] transaction details page for additional information including the ***Retrieve Document Response Message***.

8.4 Option 2 - FHIR Health Information Exchange (HIE) Pattern Using CA:FeX

8.4.1 Constraints on PS-CA Use Case Actors: Option 2 - FHIR Health Information Exchange (HIE) Pattern Using CA:FeX

The section below captures some of the design constraints on use case actors when developing functionality to support the services mapped to those Use Case Actors.

Note: The scope of this section is limited to the constraints that are applicable to actors and transactions defined in the CA:FeX Interoperability Specifications.

While global implementations are actively testing various ways to exchange patient summaries and other documents (See *Pan-Canadian FHIR Exchange (CA:FeX) Interoperability Specifications: Preface*), more sophisticated exchange patterns may not be as accessible for implementers in the current state. As such, PS-CA has identified the patterns in CA:FeX that early implementers are most likely to start with.

This implementation is currently constrained to only support FHIR-assembled documents in the form of a Bundle of resources of type "document" that has a Composition resource as the first resource in the bundle, followed by a series of other resources, referenced from the Composition resource, that provide supporting evidence for the document.

The two key services supported by CA:FeX are:

- Save PS-CA to Document Repository
    - Submit Data [CA:FeX-1]
- Retrieve PS-CA from Document Repository
    - Search Data [CA:FeX-2A]
    - Retrieve Data [CA:FeX-3A]

The following section provides key design constraints for implementation of these two required services using the CA:FeX Interoperability Specifications and FHIR standards.

Save PS-CA to Document Repository

PS-CA Producer attempts to save a PS-CA in the Document Repository. The PS-CA Producer implements the Data Source actor from the CA:FeX Interoperability Specifications by using the Save PS-CA to Document Repository service. Similarly, the Document Repository implements the Data Recipient actor from the CA:FeX Interoperability Specifications.

These actors shall use the transaction **Submit Data [CA:FeX-1]** of CA:FeX that executes a *Submit Data Request* from a Data Source to a Data Recipient.

Note: Global, pan-Canadian, and jurisdictional practices for document lifecycle management of patient summaries are still in development. For this reason, the management, verification, replacement and deprecation of documents, are out of scope of the guidance included in this release but have been included in the roadmap for

future releases. *This does not preclude or prevent early implementers from defining their document management practices and beginning to exercise them in their own specifications.*

Submit Data [CA:FeX-1]

This message involves a request by a Data Source to transfer a PS-CA FHIR Document Bundle to a Data Recipient. The request is received by a Data Recipient which stores the received PS-CA document bundle and returns an HTTP response code.

Trigger Events

This method is invoked when the Data Source needs to submit a FHIR Document Bundle to a Data Recipient (Document Repository).

Message Semantics

This message uses the HTTP POST method on the target Submit Data endpoint to convey the metadata and the document(s) as a FHIR transaction. The Data Source shall initiate a FHIR "transaction" using a "create" action by sending an HTTP POST request method composed of a FHIR Bundle Resource (with type of document). The content type of the HTTP body shall be either application/fhir+json or application/fhir+xml.

Expected Actions

The Data Recipient shall accept both content types application/fhir+json and application/fhir+xml. On receipt of the submission, the Data Recipient shall validate the resources and respond with one of the HTTP response codes and an OperationOutcome, if applicable. For additional information on HTTP response codes, refer to *Exchanging Documents in FHIR* in the CA:FeX Specifications.

Retrieve PS-CA from Document Repository

The PS-CA Consumer and Document Repository (Central) Use Case Actors are required to implement the *Retrieve PS-CA from Document Repository* service.

These actors shall use the following transactions to find document metadata and retrieval of identified Patient Summary document:

- **Search Data [CA:FeX-2A]**
- **Retrieve Data [CA:FeX-3A]**

Search Data [CA:FeX-2A]

This message involves a query request by Data Consumer for PS-CA FHIR Document Bundle matching the search criteria included in the request. The request is received by Data Responder which returns a *searchset* Bundle containing the document(s) matching search parameters.

The Data Consumer may use HTTP GET or HTTP POST based searches. The Data Responder shall support both GET and POST based searches.

Trigger Events

When the Data Consumer needs to discover PS-CA FHIR Document Bundles in the Document Repository matching various parameters.

Message Semantics

The Data Consumer executes a FHIR search request against the Data Responder endpoint (FHIR Repository).

The Data Consumer may use HTTP GET or HTTP POST based searches. The Data Responder shall support both GET and POST based searches.

GET [base]/Bundle?composition

POST [base]/Bundle/_search{?&_format=[mime-type]}

Query Search Parameters

Search Document Bundle operation shall include the following search parameters:

Query Search Parameters	Description	Usage Note
timestamp (bundle.timestamp)	This parameter, of type date, specifies the timestamp when the FHIR bundle was created. See FHIR http://hl7.org/fhir/R4/search.html#date for use of the date search type.	Applied directly on Bundle, does not require chaining. Usage of prefix modifiers encouraged for targeted retrieval by date.
type (bundle.composition.type)	This parameter, of type token, specifies the kind of composition (LOINC if possible). The use of composition.type follows the FHIR Chaining Parameters search methodology.	Will be fixed to 60591-5 for patient summary.
status (bundle.composition.status)	This parameter, of type token, specifies the status of the composition. The use of bundle.composition.status follows the FHIR Chaining Parameters search methodology.	Helpful in differentiating compositions that are final vs other statuses. See IPS Note on Composition.status.
patient.identifier (bundle.composition.patient.identifier)	This parameter, of type token, specifies an identifier associated with the patient to which the FHIR bundle is assigned. This use of patient.identifier follows the FHIR Chaining Parameters search methodology.	Should include system and value to prevent improper retrieval of patient summaries.

Query Result Parameters

Search Document Bundle operation may include the following result parameters to help organize and manage the returned results. They are not required by the specification but are considered conditionally useful in environments where multiple patient summaries are expected to be returned for the subject of care.

Result Parameters	Description
_sort	This parameter is used to indicate the sort rules (both priority elements and sort direction). Can be applied using comma-separated lists of rules. See Sorting for more details on its use.
_count	This parameter is used to minimize the number of results that are returned in a single page of the response bundle. See Page Count for more details on its use.

Note: The combination of `_sort` *and* `_count` *can be used to return only the latest resource that meets a particular criteria - set the criteria, and then sort by date in descending order, with* `_count=1` *. This way, the last matching resource will be returned.*

Example Search Queries

Search by Type of Patient Summary

Note: This is the base that is recommended for all searches for patient summaries to build on. This type is shared by IPS and national implementations of the Patient Summary and therefore will return any patient summaries for the subject of care.

GET [base]/Bundle?composition.type=60591-5

Search by Type + Patient Identifier

GET [base]/Bundle?composition.type=60595-1&composition.patient.identifier=[system]|[value]

Search by Type + Date with qualifier

GET [base]/Bundle?composition.type=60591-5&date=gt2021-01-01

Search by Type + Status

GET [base]/Bundle?composition.type=60591-5&status=final

Expected Actions

The Data Responder shall process the query and return a search result Bundle matching the search criteria included in the request. The FHIR standard provides encodings for responses as either JSON (application/fhir+json) or XML (application/fhir+xml). For additional information on HTTP response codes, refer to *Exchanging Documents in FHIR* in the CA:FeX Specifications.

Security Considerations

This transaction should not return information that the Data Consumer is not authorized to access. Authorization is inclusive of system, app, user, and purpose, according to local policy, patient consents, and security layering. However, the transaction may return search result bundles that have Reference elements that the Data Consumer may not have access to. This is to say that the authorization need only be to the content returned in the Bundle. There may be references (URLs) for which the content is not authorized. This is considered proper as the Data Consumer would need to retrieve the content pointed to by those references, and at that time the proper authorization decision would be made on that context and content. In this way it is possible for a Data Consumer to get Resources that are pointing at data that the Data Consumer is not authorized to retrieve. Thus, the URLs used must be carefully crafted so as to not expose sensitive data in the URL value. Also most of the significant resources should be included in the document, so it wouldn't be possible to strip out sensitive content, and thus the whole document should be treated as sensitive.

Retrieve Data [CA:FeX-3A]

This transaction involves a request by the Data Consumer for retrieving the identified PS-CA FHIR Document Bundle from a FHIR Repository. The desired Document Bundle is identified by the target server's record ID for that PS-CA FHIR Document Bundle. The request is received by the Data Responder which returns the requested PS-CA FHIR Document Bundle and returns an HTTP response code.

This message uses the HTTP GET request to retrieve the identified PS-CA FHIR Bundle from the central FHIR repository.

Trigger Events

This method is invoked when the Data Consumer needs to retrieve a FHIR Document Bundle.

Message Semantics

The Data Consumer sends an HTTP GET request to the server based on a known resource ID from the Data Responder. The Read operation will return a document Bundle resource containing the Patient Summary Composition and linked resources.

GET [base]/Bundle/[id]

Expected Actions

The Data Responder shall process the query and respond with PS-CA FHIR Bundle matching the specified ID included in the request. When the requested document is returned, the Data Responder shall respond with an HTTP Status Code 200. The HTTP message-body shall be the content of the requested document. For additional information on HTTP response codes, refer to *Exchanging Documents in FHIR* in the CA:FeX Specifications.

Security Considerations

This transaction should not return information that the Data Consumer is not authorized to access.

9 Privacy & Security Guidance

9.1 Privacy Considerations

Infoway has developed a privacy primer, Privacy as an Enabler, that provides an introduction to interoperability, an overview of Canadian privacy laws and some practical approaches to privacy for interoperability. It delves into the role privacy plays in the creation of interoperable health systems. It addresses the myth that privacy laws mean patient data can't be shared. The primer outlines how privacy laws enable the sharing of patient data by providing guidance on how to share health data safely, with a patient's consent, and the responsibilities of both parties when patient information is shared.

Download the privacy primer here: Privacy as an Enabler: Sharing Personal Health Information for Interoperability Primer.

9.2 Security Considerations

It is recommended that vendors and jurisdictions ensure appropriate security services, mechanisms and functionality are in place for the PS-CA Specifications, depending on maturity levels of current capabilities. For example, security considerations include the following:

- Authorization
- Authentication
- Role-Based Access Control
- Data Encryption
- Segregate Duties
- Audit Logging
- Security Labels
- Digital Signatures
- Communication
- Narrative

10 Information Models, Application, and Infrastructure

This table provides key implementation guidance for Information Models, Applications and Infrastructure for the PS-CA specifications.

Information Models: Information models are widely used to express structure and process resulting in data interchange formats and behaviours.

Application: Functional specifications are laid down at the Information level. These form the basis for the technical specifications, which are described at the Application level. At this level, agreements have to be made within both the PS-CA Producer and PS-CA Consumer regarding the integration of various applications between which information is exchanged.

Infrastructure: Infrastructure refers to the communication between systems in the different healthcare organizations. Agreements are defined between PS-CA Solutions and jurisdictions on the design of the infrastructures, databases, networks, exchange protocols, tokens and other technologies.

Categories	Concept	Implementation Guidance Description
Information Models	**PS-CA: Data Domains of Interest by Canadian Jurisdiction and Release**	The Preface includes a table representing the alignment of the PS-CA to the IPS, data domains of interest by Canadian jurisdiction and the PS-CA Release 1 and 2 plans has been created and validated through stakeholder engagement. Release 1 will include all of the data domains highlighted in the Release 1 column and Release 2+ will continue to build on the Release 1 data domains as well as add the additional data domains.

Categories	Concept	Implementation Guidance Description
Information Models	**Valuesets**	Data residing in a clinical system will need to be mapped to appropriate FHIR profiles and Valuesets from the Content Data Model of the PS-CA specification in Release 1. Valuesets define the possible choices of coded concepts for a data element within a PS-CA. The concept domains often serve the function of a predicate to be tested. In any clinical setting, implemented systems usually host many Valuesets. Valuesets are often localized, which makes semantic interoperability between systems difficult without extensive cross-mapping. Infoway is working with Canadian jurisdictions to identify suitable pan-Canadian valuesets that promote the use of standard terminologies (e.g., SNOMED CT) for exchange of patient summaries in Canada. The PS-CA specification also encourages global interoperability where possible for international exchange. Valuesets that have been defined by the HL7® FHIR® Base Standard or by the IPS Specification for the purposes of interoperable international exchange can also be found within this specification. Given these goals, this guide employs a number of profiling mechanisms to note terminologies in use in the jurisdictions and facilitate the implementation of standardized terminologies in use nationally and globally. For more information on the Valueset implementation patterns, please refer to the Terminology Approach page in the pan-Canadian Patient Summary FHIR Implementation Guide.
Application	**Patient Summary References (e.g., Patient Identity)**	The PS-CA Solution (e.g., EMR, EHR) will leverage their existing product standards and policies for identifying the patient/ subject of care. However, if there is a central service available for patient identity, then the PS-CA Solution can leverage those services for uniquely identifying the patient/subject of care. For more information on the patient identity implementation patterns, please refer to the IHE Profile PDQm and PMIR in the Appendices.
Application	**Render to Specific Format (e.g., PDF, CDA)**	It is recommended that the PS-CA Solution leverages the CA:FMT Interoperability Specifications that provides formatting support service. It provides support for transformation of documents between different formats (e.g., from FHIR to PDF, CDA, etc.). Content is in development and will be added in future roadmaps.

Categories	Concept	Implementation Guidance Description
Application	**Data Interchange Format**	JSON is the recommended data interchange format for the implementation of the PS-CA interoperability use cases. • The server actors (PS-CA Recipient and PS-CA Responder) are required to support JSON and XML. • The client actors (PS-CA Producer and PS-CA Consumer) can use either JSON or XML.
Application	**Data Conversion / Structured Data**	The PS-CA should be a FHIR Document (meaning that it is authored and assembled using FHIR). For scenarios where the implementation requires the delivery of the document in a different form (e.g., PDFs), jurisdictions should use conversion and translation services that can convert FHIR Documents.
Application	**On-Demand**	The long-term vision for the PS-CA standard is to include an on-demand option where a PS-CA consumer submits a request and based on that request, a PS-CA is assembled on-demand and returned to the consumer.
Infrastructure	**Jurisdictional Infrastructures**	Integration of the recommended actors and transactions of the PS-CA standard into existing jurisdictional healthcare infrastructures may differ; therefore, it is highly recommended that local implementation guidance is reviewed prior to the implementation of the PS-CA standard. Example: For user authentication, Alberta uses certificate-based security footprint while Ontario uses token-based security.
Infrastructure	**Document Management**	Implementation of the PS-CA standard must refer to jurisdictional specific requirements and policies for document management, including archiving, replacement, etc.

11 PS-CA Content Data Model & FHIR® Profiles

The FHIR® Artefacts (Profiles, ValueSets, Extensions, etc.) of the PS-CA Specifications are presented in the PS-CA Simplifier FHIR Implementation Guide.

As this is an evolving specification that is being updated as feedback is acquired from various engagement activities, the profiles use a versioning system to help implementers understand their development status prior to each release of the PS-CA Specifications.

The PS-CA Simplifier FHIR IG v1.0.0 TI Candidate acts as a snapshot in time of the profiling and conformance expectations of PS-CA Interoperability Specifications v1.0.0 TI Candidate. This will allow for evolution of profiles to prepare for future releases of the PS-CA, without undermining the stability of the v1.0.0 profiles. Instructions on how to access and use the v1.0.0 package will be provided.

Implementers are encouraged to begin by reviewing the PS-CA Library of Profiles page which describes the Patient Summary Composition Structure & Profiles (e.g., sections that make up the data model content for the PS-CA).

The list of summary sections within the Patient Summary-CA Composition and their respective profiles can be found below.

Note: Some elements in the Header section reference profiles that do not have appropriate equivalents in the current IPS specification. Implementers are encouraged to utilize the minimal profiling expectations outlined National Canadian Baseline profiles in these cases.

PS-CA Section	FHIR® Profiles
Subject	Patient (PS-CA)
Author	Practitioner (CA Baseline), PractitionerRole (CA Baseline), Organization (CA Baseline), Patient (PS-CA)
Attester	Practitioner (CA Baseline), PractitionerRole (CA Baseline), Organization (CA Baseline), Patient (PS-CA)
Custodian	Organization (CA Baseline)
Allergies and Intolerance	AllergyIntolerance (PS-CA)
Problem List	Condition (PS-CA)
Immunizations	Immunization (PS-CA)
History of Procedures	Procedure (PS-CA)

PS-CA Section	FHIR® Profiles
Medication Summary	Medication (PS-CA), MedicationRequest (PS-CA), MedicationStatement (PS-CA)
Vital Signs	Vital Sign (Global)
Past History of Illness	Condition (PS-CA)
Social History	SHx Observation: Generic (PS-CA), SHx Observation: Alcohol Use (PS-CA), SHx Observation: Tobacco Use (PS-CA)
Family History	FamilyMemberHistory (PS-CA)

Additional information on the PS-CA FHIR® Profiles can be found in the pan-Canadian Patient Summary – FHIR Implementation Guide