pan-Canadian Patient Summary

Companion Guide: Reference Architecture

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Canada Health Infoway

Table of Contents

1 Introduction

The pan-Canadian Patient Summary - Companion Guide to Reference Architecture provides guidance on how to apply specific IHE patterns and pan-Canadian Interoperability Specifications to address interoperability needs pertaining to the Patient Summary-CA use cases. It defines the interoperability landscape and outlines the rules of engagement to support the development of a connectivity platform for which external vendors can test and validate their solutions.

For more information on core IHE Profiles and specific Canadian implementation guidance, refer to the Reference Architecture available here: RA v0.1.1 DFT.

2 Intended Audience

The intended audience of the pan-Canadian Patient Summary - Companion Guide to Reference Architecture includes, but is not limited to, the following:

- IT departments of healthcare institutions (technical product managers, IT managers, operations staff)
- Technical staff of vendors participating in the IHE initiative
- Experts involved in standards development
- Individuals and teams responsible for implementing software solutions such as project managers, CTOs, CISOs, software engineers, technical product managers, IT managers, operations staff, and other similar roles.

3 Overview

This document is a Companion Guide to Reference Architecture for the PS-CA. It contains a list of recommended IHE candidate profiles and pan-Canadian Interoperability Specifications that can meet specific needs of the PS-CA. The sequence diagrams group together actors and transactions from multiple profiles to address the business requirements of the PS-CA use cases.

Within the Reference Architecture, two options for implementation have been highlighted, with Option 1 having two scenarios.

- Option 1, Scenario #1: MHD implementation, where the Document Repository is Central
- Option 1, Scenario #2: MHD implementation, where the Document Repository is Local
- Option 2: FHIR HIE Implementation
- A preferred option is indicated with an asterisk* (e.g. Option 1, Scenario #1)

For details about the Reference Architecture, refer to the RA v0.1.1 DFT.

4 How to Use the pan-Canadian Patient Summary - Companion Guide to Reference Architecture

Below list summarizes how to use this document:

- **Role Identification**: Jurisdictions and vendors will need to identify their role (e.g. actors) from the Reference Architecture and sequence diagrams for each of the use cases in scope for the Patient Summary-CA project.
- **Gap Identification**: Based on the role(s) identified from the Reference Architecture and sequence diagrams, potential assessment is needed for identification of gaps for meeting the requirements of the standardized actors and transactions needed to satisfy particular PS-CA use cases.
- **Provincial Reference Architecture**: Provinces and jurisdictions may need to draft their own version of Reference Architecture specific to their needs. Current technology landscape, existing architecture and current business priorities will help in developing a version for the province.
- **Document Evolution and Feedback**: This is a living document and will evolve based on feedback and refinements to the PS-CA uses cases and business requirements. This document is published on InfoScribe to capture comments and feedback from all key stakeholders. Additionally, multiple sessions will be conducted to discuss and update the content of this document.
- **Vendor Conformance Testing (Connectathon / Projectathon)**: This document will provide an opportunity for vendors to prepare for conformance testing of the Patient Summary-CA Standard via the IHE Gazelle platform. IHE Gazelle is an open-source, web-based test platform supporting a wide portfolio of interoperability test tools suited to validate interface conformity to IHE Profiles and project-specific standards-based interoperability specifications. Vendors can validate their products and eHealth projects to procure interfaces they deploy. For additional information on Gazelle, please refer to the following link: IHE Gazelle

*Note: It's expected that the reader should have a moderate degree of familiarity with IHE profiles, especially MHD, MHDS, PMIR, PIQm, PDQm, mCSD, ATNA, CT and IUA.

5 Sequence Diagrams for UC-01: HCP Creates PS

This section provides a summary of the sequence diagrams for Use Case-01:

Use Case-01: HCP Creates/Produces a PS-CA

A Health Care Provider in any care setting creates/produces a PS-CA for use at point of care, including for unscheduled/scheduled local care, which is made available to PS-Consumers.

Implementation Option 1: MHD

This option is recommended for jurisdictions who would like to use document repository/registry patterns and promote HL7 FHIR standards for the creation and viewing of a Patient Summary-CA.

Implementation Option 2: CA:FeX

This option is recommended for jurisdictions who would like to use FHIR health information exchange (HIE) patterns that provide support for submitting, searching and retrieving a Patient-Summary-CA to and from a central Document Repository using FHIR resources.

Additional Considerations

The sequence diagrams included in this section do not showcase all of the possible combinations of IHE profiles and transactions that can be used for a particular implementation pattern. For example, ITI-83 transaction can be used in place of ITI-78 if the preferred implementation pattern is PIXm/PMIR.

5.1 UC-01: Implementation Option 1: MHD

Scenario / Assumption(s): Patient Summary-CA is stored in Central or Local (Decentralized) Document Repository

Release 1: Clinical data (e.g. medication, lab results, immunization) is retrieved from local sources only

Implementation Option 1: This sequence diagram provides the option of using the MHD IHE profile, including a Document Repository actor and supporting HL7 FHIR standards.

*Note: Please refer to the pan-Canadian Patient Summary – FHIR Implementation Guide for the Patient Summary-CA Valuesets

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of systems should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational Profiles, defined here, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.

- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- For more information on core IHE Profiles and specific Canadian implementation guidance, refer to the RA v0.1.1 DFT.

UC-01: HCP Creates PS – MHD

PS is stored in Central or Local (Decentralized) Document Repository

R1 – clinical data (e.g. medication, lab results, immunization) is retrieved from local sources only
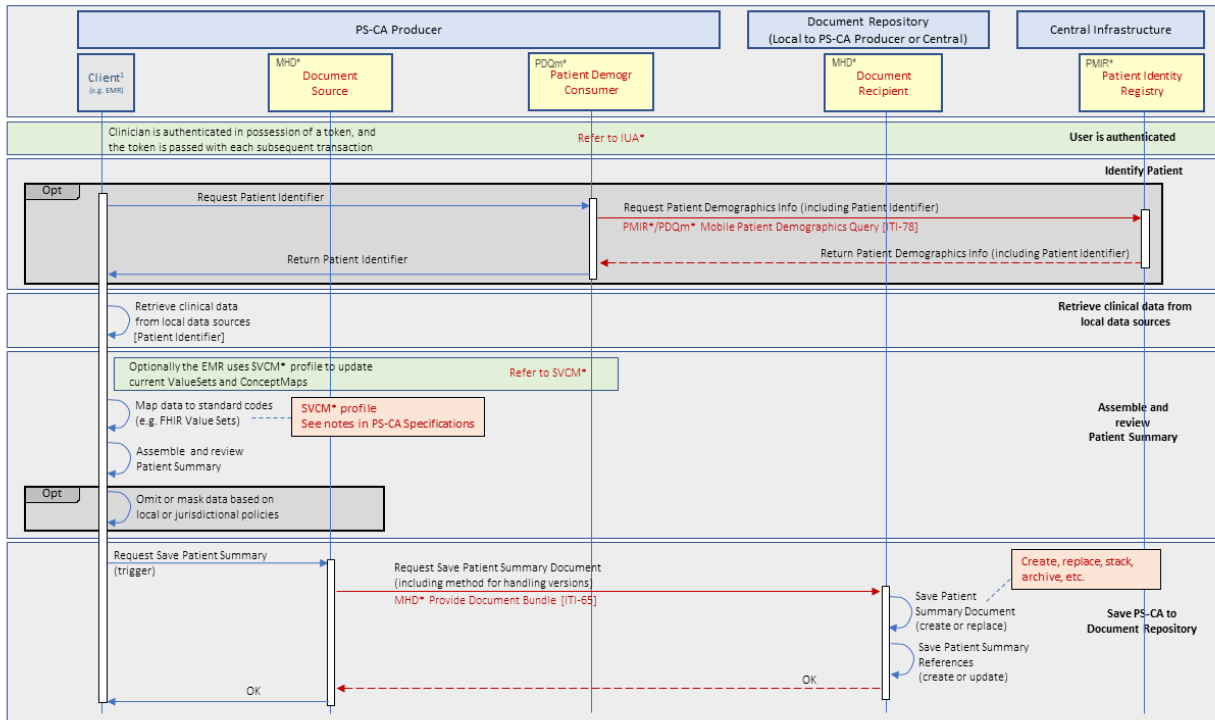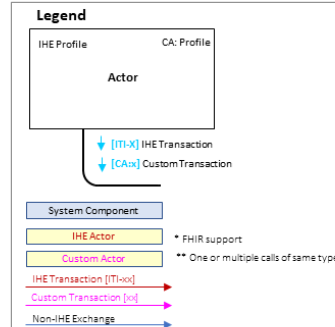
5.2 UC:01: Implementation Option 2: CA:FeX

Scenario: Clinical Solution A Retrieves Patient Summary-CA from Central Document Repository

Assumption: Patient Summary-CA is stored in Central Document Repository

Implementation Option 2: This sequence diagram provides the option of using the CA:FeX Interoperability Specifications that provide support for saving and retrieving a Patient Summary-CA to and from a central

Document Repository. This profile includes a Data Source and a Data Recipient actor. Additionally, this sequence diagram uses the 'Submit Data' FHIR operation.

Note: Additionally, this sequence diagram includes the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.
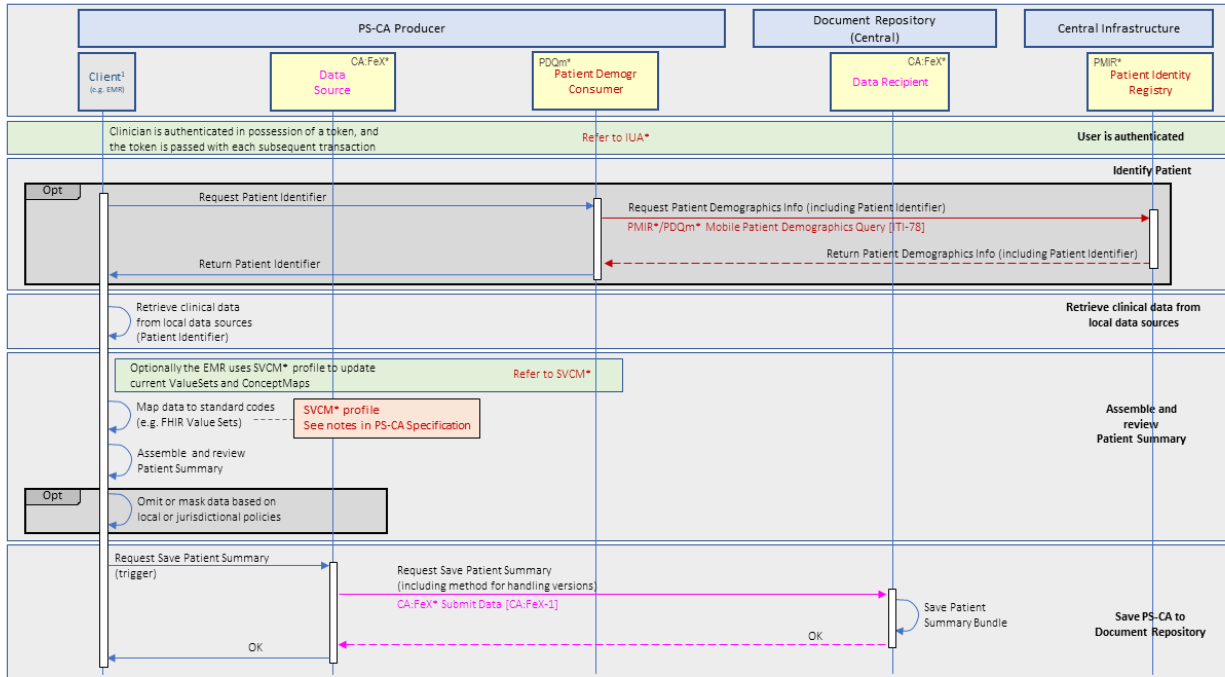
Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of systems should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational Profiles, defined here, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes the CA:FeX Interoperability Specifications and CA:FMT Specifications. Additional details will be included in the PS-CA Interoperability Specifications.
- For more information on core IHE Profiles and specific Canadian implementation guidance, refer to the RA v0.1.1 DFT.

UC-01: HCP Creates PS – CA:FeX

PS is stored in Central Document Repository

R1 – clinical data (e.g. medication, lab results, immunization) is retrieved from local sources only

**Footnotes**

1. Examples of the client system can be any of the following: EMR, HIS, CIS, PHR, or EHR

Prerequisites

Client is logged into the system (IUA*)

Client obtained a valid access token from the Authorization Server that is used with each transaction (IUA*)

All communication is done through secure channels (ATNA)

System time is synchronized among all components (CT)

Legend
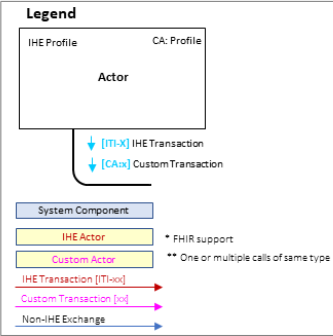
6 Sequence Diagrams for UC-02: HCP Views/Consumes a PS-CA

This section provides a summary of the sequence diagram for Use Case-02:

Use Case-02: HCP Views/Consumes a PS-CA

A Health Care Provider in any care setting requests and uses a PS-CA at the point of care, including for unscheduled/ scheduled local care.

Implementation Option 1: MHD

This option is recommended for jurisdictions who would like to use document repository/registry patterns and promote HL7 FHIR standards for the creation and viewing of a Patient Summary-CA.

Implementation Option 2: CA:FeX

This option is recommended for jurisdictions who would like to use FHIR health information exchange (HIE) patterns that provide support for submitting, searching and retrieving a Patient-Summary-CA to and from a central Document Repository using FHIR resources.

Additional Considerations

The sequence diagrams included in this section do not showcase all of the possible combinations of IHE profiles and transactions that can be used for a particular implementation pattern. For example, ITI-83 transaction can be used in place of ITI-78 if the preferred implementation pattern is PIXm/PMIR.

6.1 UC-02: Implementation Option 1: MHD

Scenario: Clinical Solution A Retrieves Patient Summary-CA from MHD Document Registry – (MHD* IHE Profile).

Assumption: Patient Summary-CA is stored in Central or Local (Decentralized) Document Repository.

Implementation Option 1: This sequence diagram provides the option of using the MHD IHE profile, including a Document Repository actor and supporting HL7 FHIR standards

Note: Additionally, this sequence diagram include the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc). Additional details will be included in the PS-CA Interoperability Specifications.

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 2 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational Profiles, defined here, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.

- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.
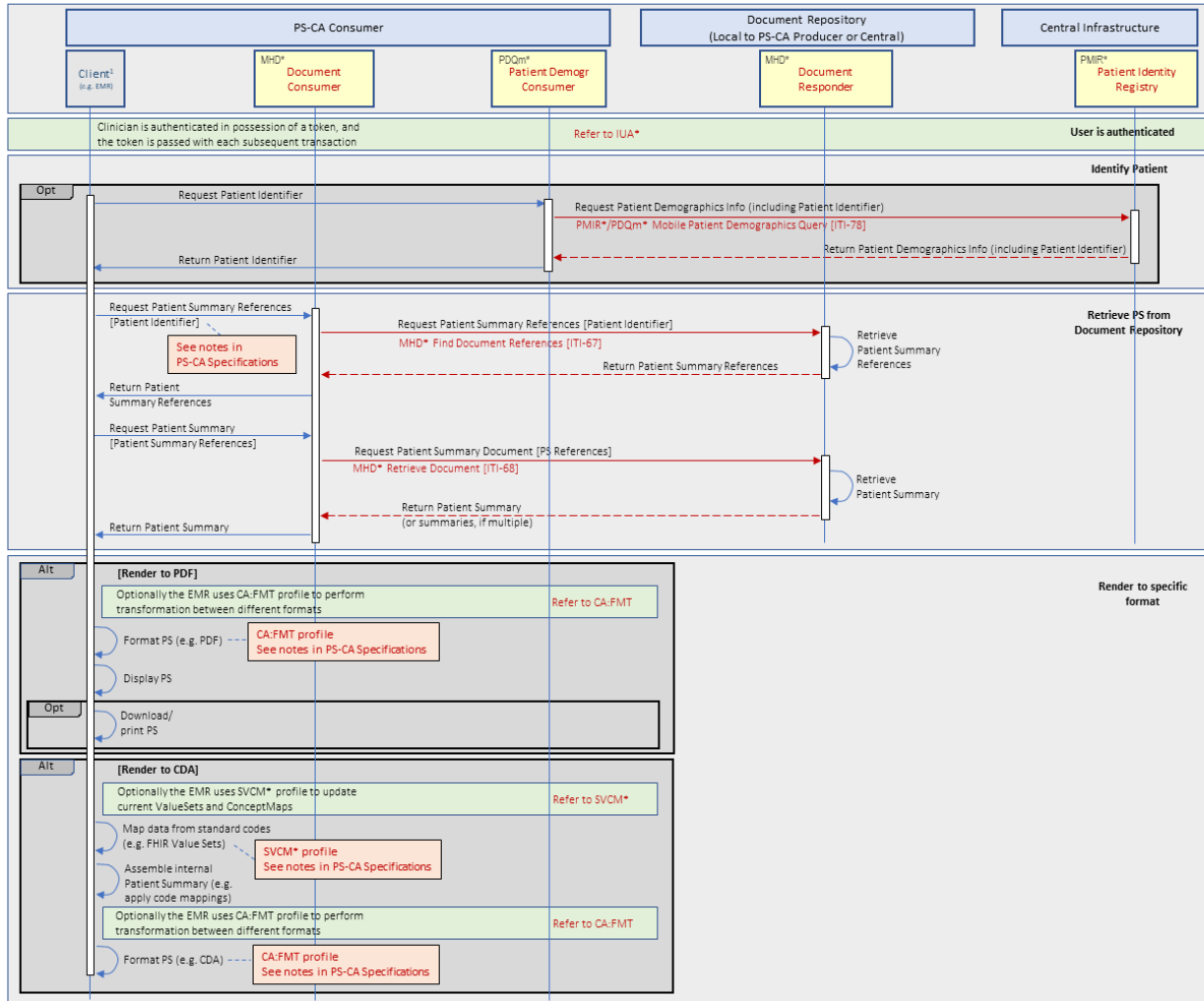- For more information on core IHE Profiles and specific Canadian implementation guidance, refer to the RA v0.1.1 DFT.

UC-02 HCP Views/Consumes PS-CA - MHD

Clinical Solution A Retrieves PS from MHD Document Registry – (MHD* IHE Profile[2])

PS is stored in Central or Local (Decentralized) Document Repository

6.2 UC:02: Implementation Option 2: CA:FeX

Scenario: Clinical Solution A Retrieves Patient Summary-CA from Document Repository

Assumption: Patient Summary-CA is stored in Central Document Repository

Implementation Option 2: This sequence diagram provides the option of using the CA:FeX Interoperability Specifications that provide support for saving and retrieving a Patient Summary-CA to and from a Document Repository (Local to PS-Producer or Central). This profile includes a Data Consumer and a Data Responder actor. Additionally, this sequence diagram uses the 'Search Data' and 'Retrieve Data' FHIR operations.

Note: Additionally, this sequence diagram includes the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of systems should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 2 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational Profiles, defined here, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes the CA:FeX Interoperability Specifications and CA:FMT Interoperability Specifications. Additional details will be included in the PS-CA Interoperability Specifications.
- For more information on core IHE Profiles and specific Canadian implementation guidance, refer to the RA v0.1.1 DFT.

UC-02 HCP Views/Consumes PS-CA – CA:FeX

Clinical Solution A Retrieves PS from Document Repository

PS is stored in Document Repository (Local to PS-CA Producer or Central)

PS-CA Consumer			**Document Repository** (Local to PS-CA Producer or Central)	**Central Infrastructure**
Client[1] (e.g. EMR)	CA:FeX* Data Consumer	PDQm* Patient Demogr Consumer	CA:FeX* Data Responder	PMIR* Patient Identity Registry

Clinician is authenticated in possession of a token, and the token is passed with each subsequent transaction — Refer to IUA* — User is authenticated

Identify Patient

Opt
- Request Patient Identifier
- Request Patient Demographics Info (including Patient Identifier)
- PMIR*/PDQm* Mobile Patient Demographics Query [ITI-78]
- Return Patient Demographics Info (including Patient Identifier)
- Return Patient Identifier

Retrieve PS from Document Repository

- Request Search Patient Summary [Patient Identifier]
  - See notes in PS-CA Specifications
- Request Search Patient Summary [Patient Identifier]
- CA:FeX* Search Data [CA:FeX-2A]
- Retrieve Patient Summary Compositions
- Return Patient Summary Composition Bundle
- Return Patient Summary Compositions
- Request Patient Summary [Bundle ID]
- Request Patient Summary Document [Bundle ID]
- CA:FeX* Retrieve Data [CA:FeX-3A]
- Retrieve Patient Summary Bundle
- Return Patient Summary Bundle
- Return Patient Summary

Render to specific format

Alt **[Render to PDF]**
- Optionally the EMR uses CA:FMT profile to perform transformation between different formats — Refer to CA:FMT
- Format PS (e.g. PDF) --- CA:FMT profile See notes in PS-CA Specifications
- Display PS
- Opt
  - Download/ print PS

Alt **[Render to CDA]**
- Optionally the EMR uses SVCM* profile to update current ValueSets and ConceptMaps — Refer to SVCM*
- Map data from standard codes (e.g. FHIR Value Sets) --- SVCM* profile See notes in PS-CA Specifications
- Assemble internal Patient Summary (e.g. apply code mappings)
- Optionally the EMR uses CA:FMT profile to perform transformation between different formats — Refer to CA:FMT
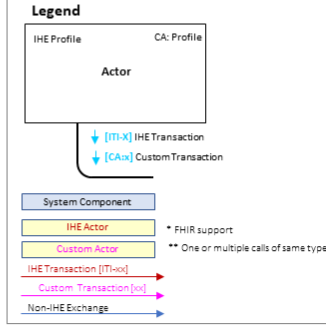- Format PS (e.g. CDA) --- CA:FMT profile See notes in PS-CA Specifications

Footnotes

1. Examples of the client system can be any of the following: EMR, HIS, CIS, PHR, or EHR

Prerequisites

Client is logged into the system (IUA*)

Client obtained a valid access token from the Authorization Server that is used with each transaction (IUA*)

All communication is done through secure channels (ATNA)

System time is synchronized among all components (CT)

Legend

IHE Profile	CA: Profile
Actor	

- [ITI-X] IHE Transaction
- [CAtx] Custom Transaction

- System Component
- IHE Actor
- Custom Actor
- IHE Transaction [ITI-xx]
- Custom Transaction [xx]
- Non-IHE Exchange

* FHIR support

** One or multiple calls of same type

7 Sequence Diagrams for UC-03 Patient Views/Obtains Personal PS-CA

This section provides a summary of the sequence diagrams for Use Case-03:

Use Case-03: Patient Views/Consumes a PS-CA

A Patient or Subject of Care accesses/views and can retrieve a copy of their own PS-CA to support unscheduled/ scheduled local care, or for any other purpose.

Implementation Option 1: MHD

This option is recommended for jurisdictions who would like to use document repository/registry patterns and promote HL7 FHIR standards for the creation and viewing of a Patient Summary-CA.

Implementation Option 2: CA:FeX

This option is recommended for jurisdictions who would like to use FHIR health information exchange (HIE) patterns that provide support for submitting, searching and retrieving a Patient-Summary-CA to and from a central Document Repository using FHIR resources.

Additional Considerations

- The sequence diagrams included in this section do not showcase all of the possible combinations of IHE profiles and transactions that can be used for a particular implementation pattern. For example, ITI-83 transaction can be used in place of ITI-78 if the preferred implementation pattern is PIXm/PMIR.
- Additionally, a jurisdictional implementation may choose to present a different version of the Patient Summary to patients than providers. For example, the patient version of the Patient Summary may use more patient friendly language, certain information that might lead to patient harm may be redacted (for example, in the case of patients undergoing behavioral health treatment).

7.1 UC-03: Implementation Option 1: MHD

Scenario: Patient Portal Retrieves PS from MHD Document Registry – (MHD* IHE Profile).

Assumption: Patient Summary-CA is stored in Central or Local (Decentralized) Document Repository.

Implementation Option 1: This sequence diagram provides the option of using the MHD IHE profile, including a Document Repository actor and supporting HL7 FHIR standards.

Note: Additionally, this sequence diagram includes the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Further details will be included in the PS-CA Interoperability Specifications. Additionally, the Document Repository in this scenario can be either (1) central or (2) at PS-CA Producer (the source where the document was produced). The Document Consumer actor would query the appropriate repository.
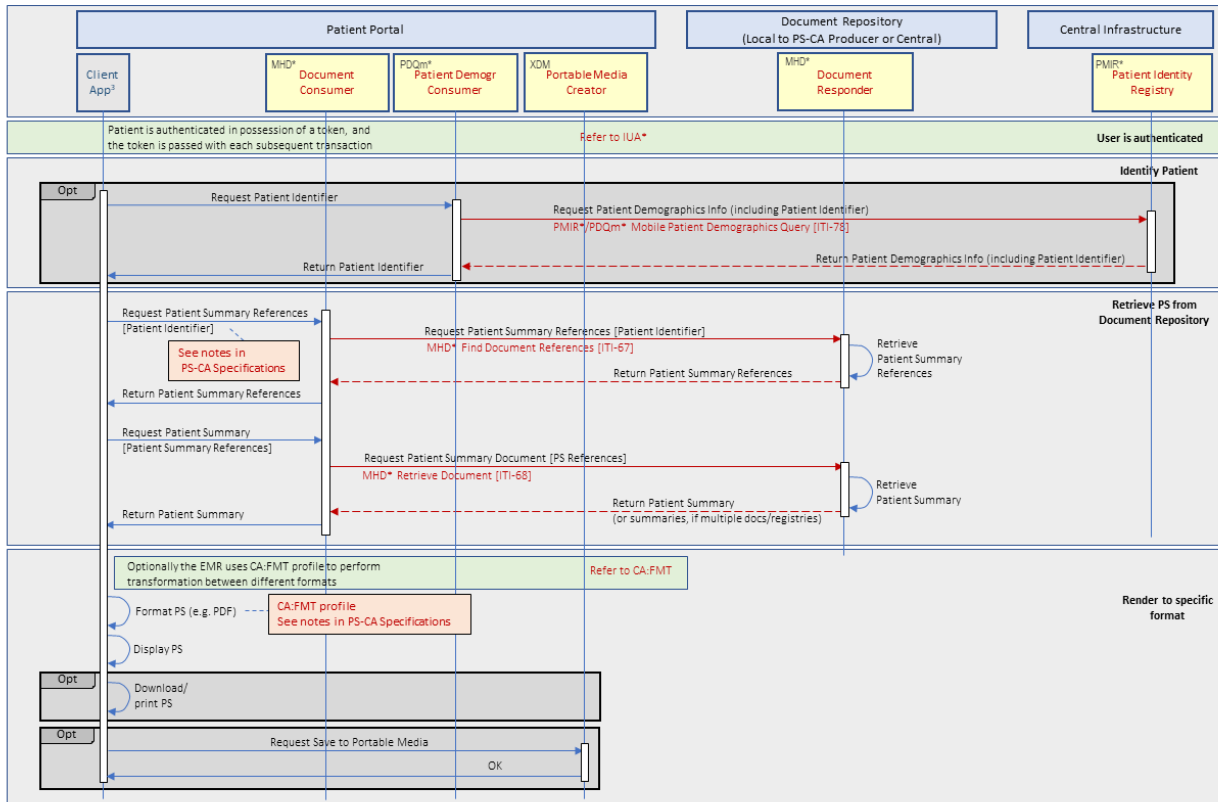
Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of systems should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 3 of the Patient Summary-CA is executed.

- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational Profiles, defined here, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- For more information on core IHE Profiles and specific Canadian implementation guidance, refer to the RA v0.1.1 DFT.

UC-03 Patient Views/Obtains Personal PS-CA - MHD
Patient Portal Retrieves PS from MHD Document Registry – (MHD* IHE Profile[2])
PS is stored in Central or Local (Decentralized) Document Repository

7.2 UC:03: Implementation Option 2: CA:FeX

Scenario: Patient Portal Retrieves Patient Summary-CA from Document Repository

Assumption: Patient Summary-CA is stored in a Local or Central Document Repository

Implementation Option 2: This sequence diagram provides the option of using the CA:FeX Interoperability Specifications that provide support for saving and retrieving a Patient Summary-CA to and from a local or central Document Repository. This profile includes a Data Consumer and a Data Responder actor. Additionally, this sequence diagram uses the 'Search Data' and 'Retrieve Data' FHIR operations.

Note: Additionally, this sequence diagram includes the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 3 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational Profiles, defined here, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram include the CA:FeX Interoperability Specifications and CA:FMT Specifications. Additional details will be included in the PS-CA Interoperability Specifications.
- For more information on core IHE Profiles and specific Canadian implementation guidance, refer to the RA v0.1.1 DFT.

UC-03 Patient Views/Obtains Personal PS-CA – CA:FeX
Patient Portal Retrieves PS from Document Repository
PS is stored in Local or Central Document Repository
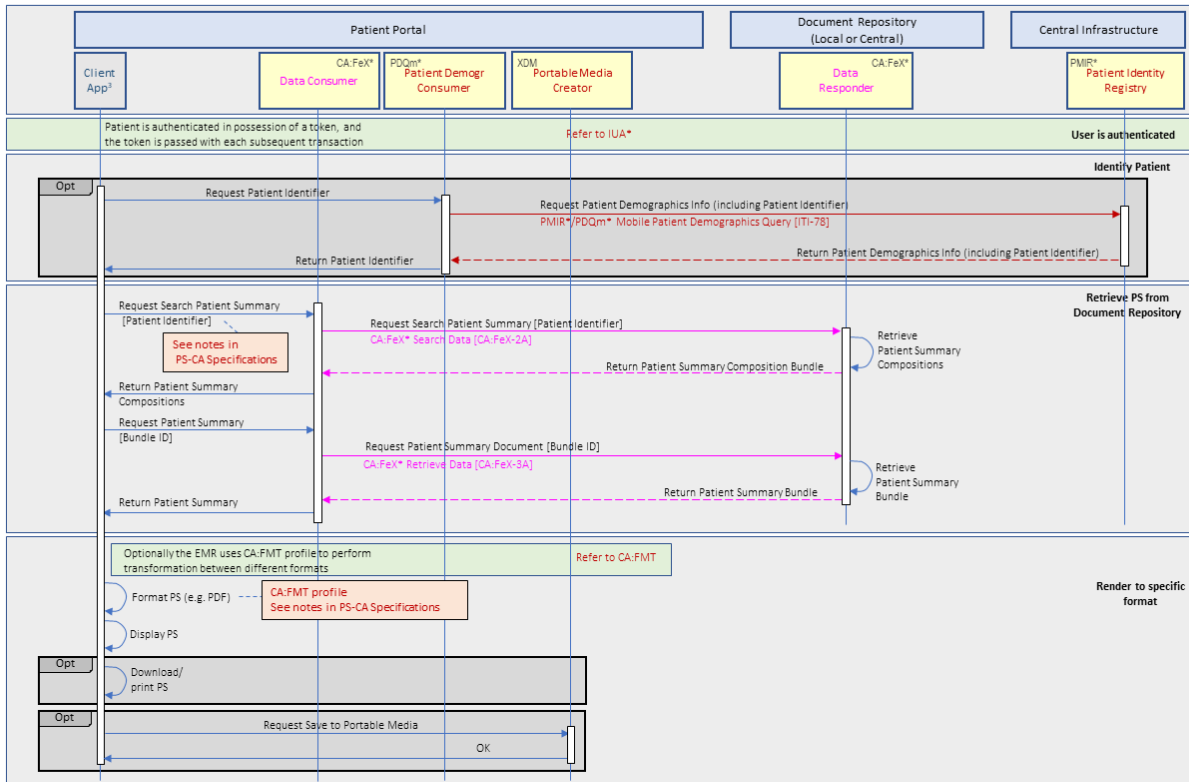
Footnotes

3. Examples of the client app can be an EMR, EHR and/or proprietary patient viewer application.

Prerequisites

Client is logged into the system (IUA*)

Client obtained a valid access token from the Authorization Server that is used with each transaction(IUA*)

All communication is done through secure channels (ATNA)

System time is synchronized among all components (CT)

Legend

IHE Profile — CA: Profile

Actor

↓ [ITI-X] IHE Transaction
↓ [CAix] Custom Transaction

System Component

IHE Actor   * FHIR support
Custom Actor   ** One or multiple calls of same type

IHE Transaction [ITI-xx]
Custom Transaction [xx]
Non-IHE Exchange