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.

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 v 0.2.0 DFT-review.

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, PIXm, PDQm, mCSD, ATNA, CT and IUA.

5 Sequence Diagrams for UC-01: HCP Creates a PS-CA

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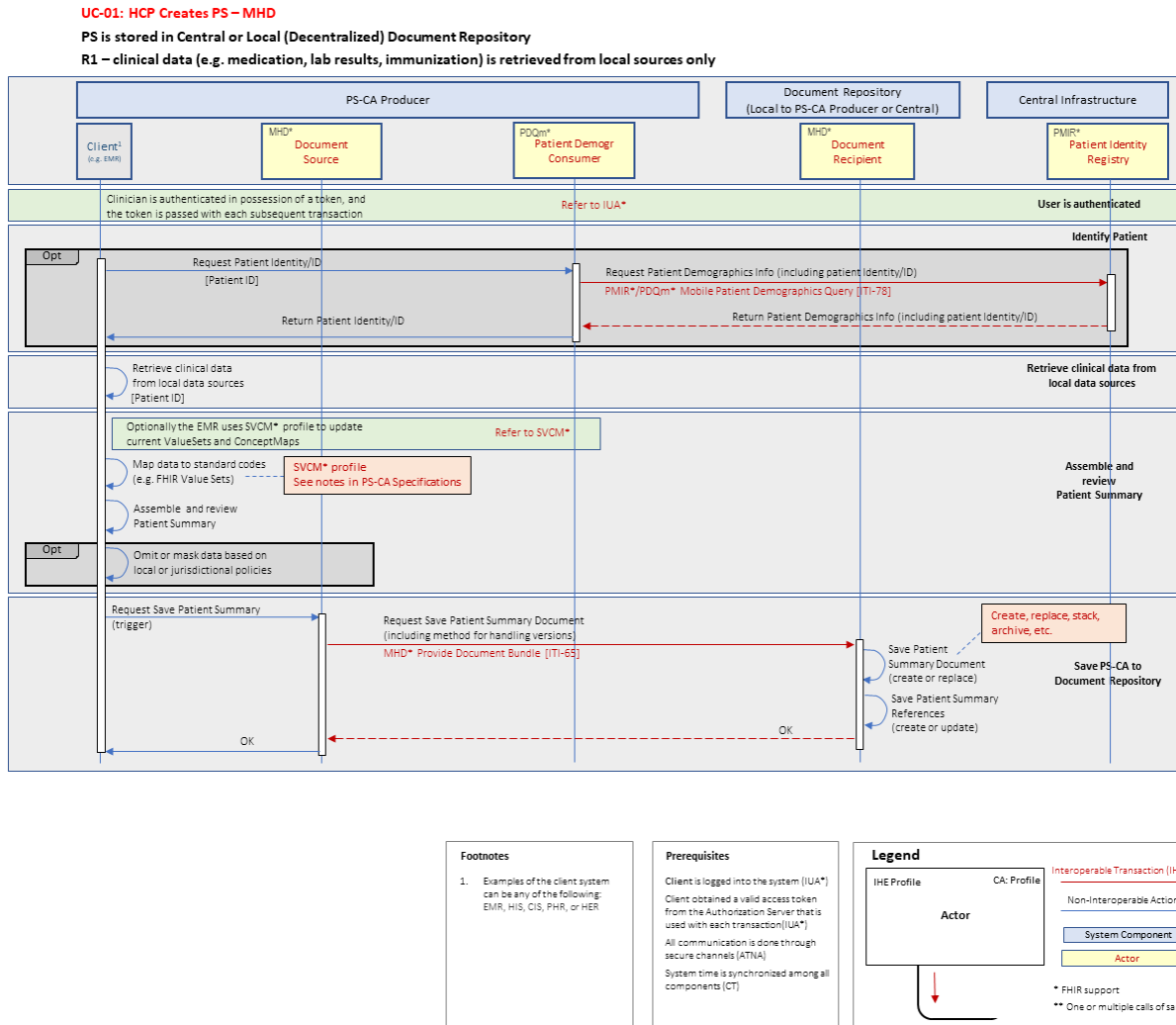
*Note: Please refer to the pan-Canadian Patient Summary – FHIR Implementation Guide for the Patient Summary-CA Valuesets

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 Reference Architecture.

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.
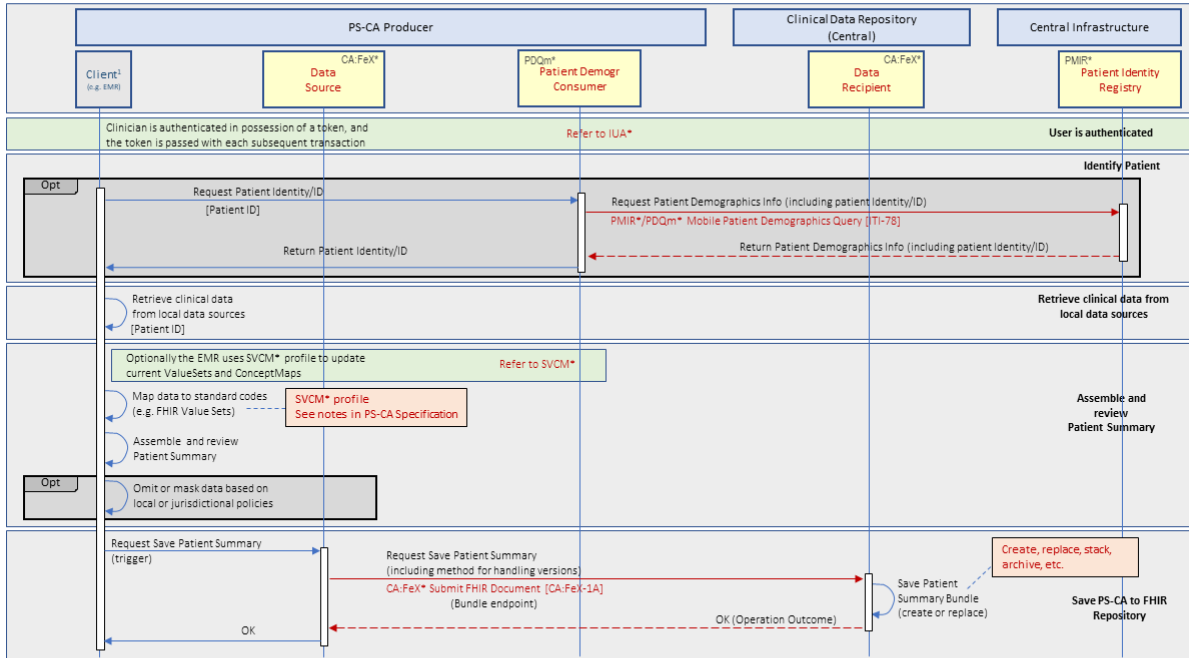
Sequence Diagram Overview:

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 Reference Architecture.

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

IHE Profile — CA: Profile

Actor

Interoperable Transaction (IHE..) [ID]

Non-Interoperable Action

System Component

Actor

* FHIR support

** One or multiple calls of same type

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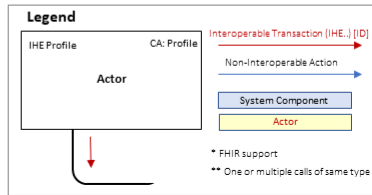
6 Sequence Diagrams for UC-02: HCP Views/Consumes a PS-CA

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 Reference Architecture.

UC-02 HCP Views/Consumes PS-CA - MHD
Clinical Solution A Retrieves PS from MHD Document Registry – (MHD* IHE Profile[2])
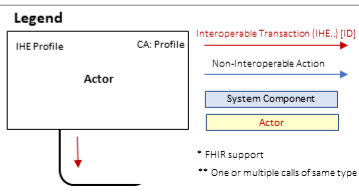PS is stored in Central or Local (Decentralized) Document Repository

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 Reference Architecture.

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UC-02 HCP Views/Consumes PS-CA – CA:FeX
Clinical Solution A Retrieves PS from Document Repository
PS is stored in Central Document Repository

| PS-CA Consumer | | | Clinical Data Repository (Central) | | Central Infrastructure |

Actors:
- 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 Identity/ID [Patient ID]
- Request Patient Demographics Info (including patient Identity/ID)
- PMIR*/PDQm* Mobile Patient Demographics Query [ITI-78]
- Return Patient Demographics Info (including patient Identity/ID)
- Return Patient Identity/ID

Retrieve PS from FHIR Repository

- Request Search Patient Summary [patient Identity/ID]
  - See notes in PS-CA Specifications
- Request Search Patient Summary [Patient Identity/ID]
- CA:FeX* Search FHIR Document [CA:FeX-2A] (Bundle endpoint)
- Retrieve Patient Summary Compositions
- Return Patient Summary Composition Bundle
- Return Patient Summary References
- Request Patient Summary [patient summary References]
- Request Patient Summary Document [Bundle ID]
- CA:FeX* Retrieve FHIR Document [CA:FeX-3A] (Bundle endpoint)
- 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
Interoperable Transaction (IHE..) [ID]
Non-Interoperable Action
System Component
Actor
* FHIR support
** One or multiple calls of same type

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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.
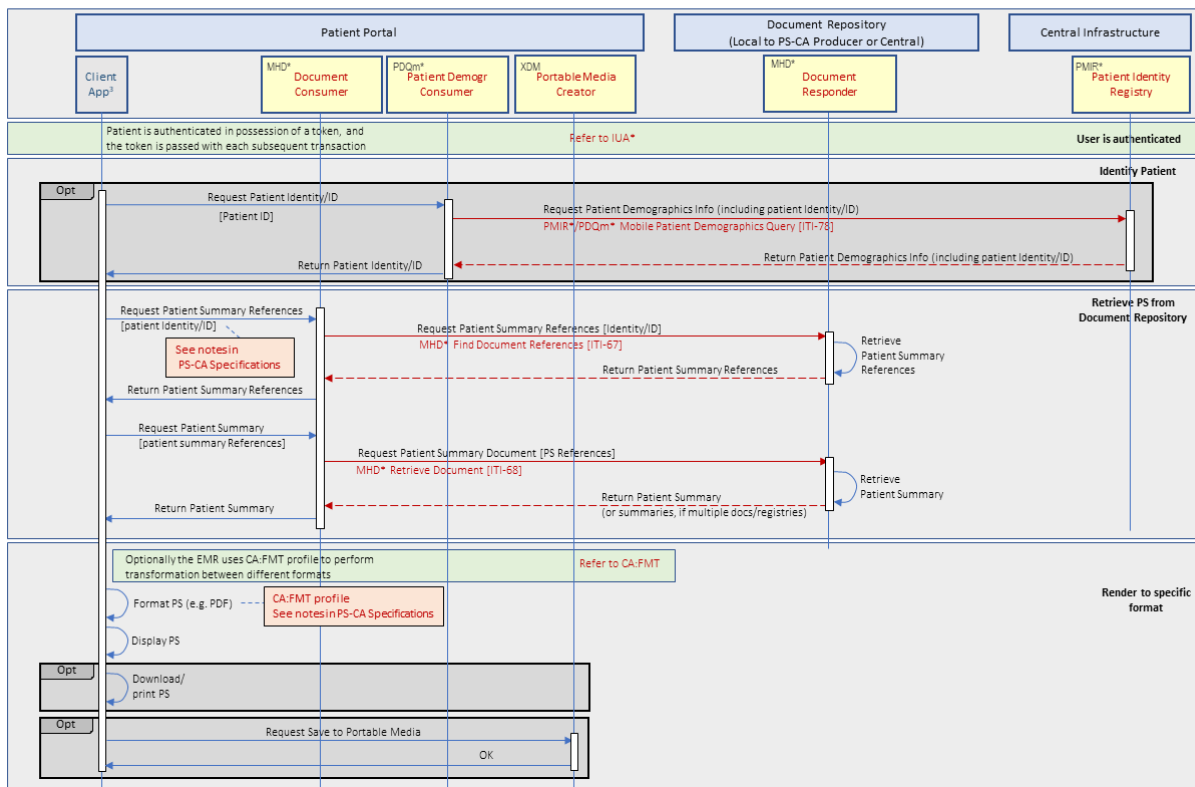
Sequence Diagram Overview:

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 Reference Architecture.

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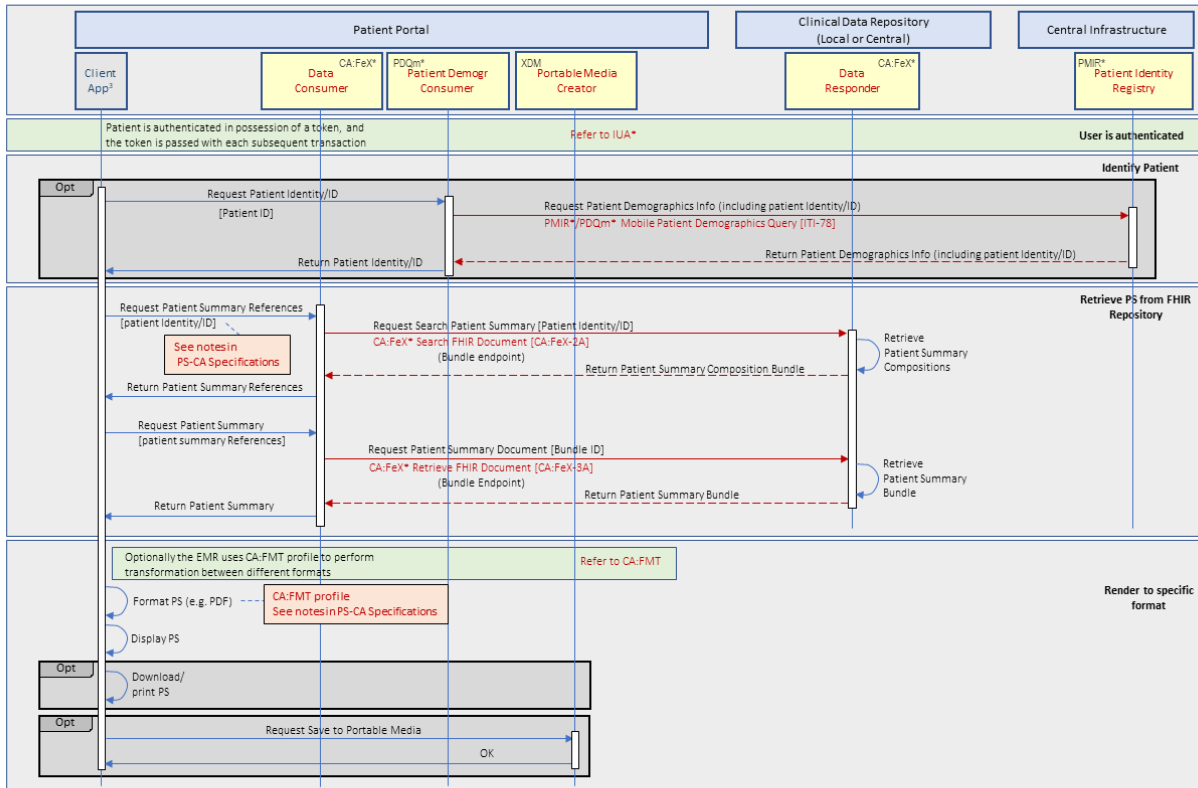
Note: Additionally, this sequence diagram includes the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.

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 Reference Architecture.

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

Patient Portal

| Client App[3] | Data Consumer CA:FeX* | Patient Demogr Consumer PDQm* | Portable Media Creator XDM |

Clinical Data Repository (Local or Central)

| Data Responder CA:FeX* |

Central Infrastructure

| Patient Identity Registry PMIR* |

Patient 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 Identity/ID [Patient ID]
- Request Patient Demographics Info (including patient Identity/ID)
- PMIR*/PDQm* Mobile Patient Demographics Query [ITI-78]
- Return Patient Identity/ID
- Return Patient Demographics Info (including patient Identity/ID)

Retrieve PS from FHIR Repository

- Request Patient Summary References [patient Identity/ID]
- See notes in PS-CA Specifications
- Request Search Patient Summary [Patient Identity/ID]
- CA:FeX* Search FHIR Document [CA:FeX-2A] (Bundle endpoint)
- Retrieve Patient Summary Compositions
- Return Patient Summary Composition Bundle
- Return Patient Summary References
- Request Patient Summary [patient summary References]
- Request Patient Summary Document [Bundle ID]
- CA:FeX* Retrieve FHIR Document [CA:FeX-3A] (Bundle Endpoint)
- Retrieve Patient Summary Bundle
- Return Patient Summary Bundle
- Return Patient Summary

Render to specific format

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
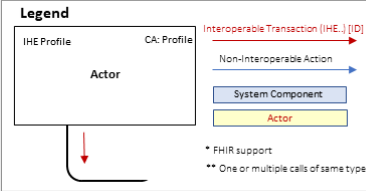
Opt
- Request Save to Portable Media
- OK

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

Interoperable Transaction (IHE..) [ID]

Non-Interoperable Action

System Component

Actor

* FHIR support
** One or multiple calls of same type

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8 Sequence Diagrams for UC-04: HCP Requests PS-CA On Demand

This section provides a summary of the sequence diagram for Use Case-04:

Use Case-04: HCP Requests PS-CA On Demand

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

Implementation Option 1: CA:FeX $summary operation

This option is recommended for systems where the clinical data needed to generate the Patient Summary is internal to the Clinical Data Repository.

Note that generally with $summary operation, servers may choose not to produce "fresh" patient summaries on every request. Due to performance impacts, servers may choose to generate Patient Summaries on a nightly or cached basis, and return those.

Implementation Option 2: CA:FeX $docref operation

This option is recommended for systems where the clinical data needed to generate the Patient Summary is either external to the Clinical Data Repository generating the summary, or distributed across various internal and external data sources.

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.

8.1 UC-04: Implementation Option: CA:FeX $summary

Scenario: Clinical Solution A Requests Patient Summary-CA On Demand from Clinical Data Repository

Assumption: Clinical data used to generate the Patient Summary is retrieved from sources internal to the Clinical Data Repository

Implementation Option: This sequence diagram provides the option of using the CA:FeX Interoperability Specifications that provide support for requesting a Patient Summary-CA on demand from a Clinical Data Repository (Local to PS-Producer or Central). This profile includes a Data Consumer and a Data Responder actor. Additionally, this sequence diagram uses the 'Retrieve Patient Summary' CA:FeX-3D transaction which is based on IPS Summary ($summary).

This implementation option is suitable for systems where the discrete FHIR resources needed to generate the Patient Summary are internal to the Clinical Data Repository where the Patient Summary is generated.

Note that generally with $summary operation, servers may choose not to produce "fresh" patient summaries on every request. Due to performance impacts, servers may choose to generate Patient Summaries on a nightly or cached basis, and return those.
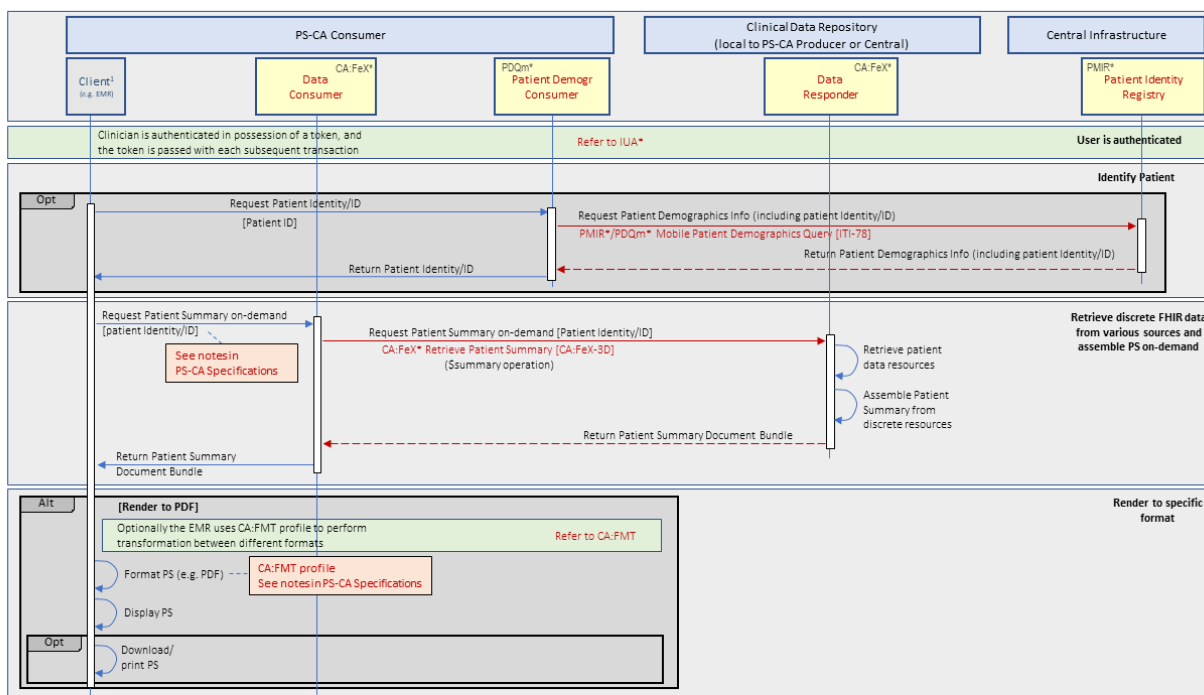
Note: Additionally, this sequence diagram includes the CA:FMT Interoperability Specifications that handle transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.

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 4 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 Reference Architecture.

UC-04 HCP Requests PS-CA On Demand – CA:FeX $summary
Clinical Solution A Requests PS on demand from Clinical Data Repository
Clinical FHIR Data Sources are internal to the Clinical Data Repository

8.2 UC-04: Implementation Option: CA:FeX $docref

Scenario: Clinical Solution A Requests Patient Summary-CA On Demand from Clinical Data Repository

Assumption: Clinical data used to generate the Patient Summary is retrieved from sources that are internal and/or external to the Clinical Data Repository

Implementation Option: This sequence diagram provides the option of using the CA:FeX Interoperability Specifications that provide support for requesting a Patient Summary-CA on demand from a Clinical Data Repository (Local to PS-Producer or Central). This profile includes a Data Consumer and a Data Responder actor. Additionally, this sequence diagram uses the 'Fetch DocumentReference' CA:FeX-2B transaction which is based on $docRef. ~~'Search Data with $docref' FHIR operation.~~

This implementation option is suitable for systems where the discrete FHIR resources needed to generate the Patient Summary are either external to the Clinical Data Repository generating the summary, or distributed across various internal and external data sources.

The on-demand Patient Summary generation occurs in two steps and involves asynchronous processing when data retrieval has longer response times, which is typically the case for external data sources. In the first step, a DocumentReference resource is created, that contains the location where the Patient Summary document is or will be available. The retrieval of the discrete FHIR resources needed to assemble the Patient Summary document is an

asynchronous operation. In the second step, the on-demand Patient Summary document is retrieved once the assembly of the discrete FHIR resources is complete.

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.
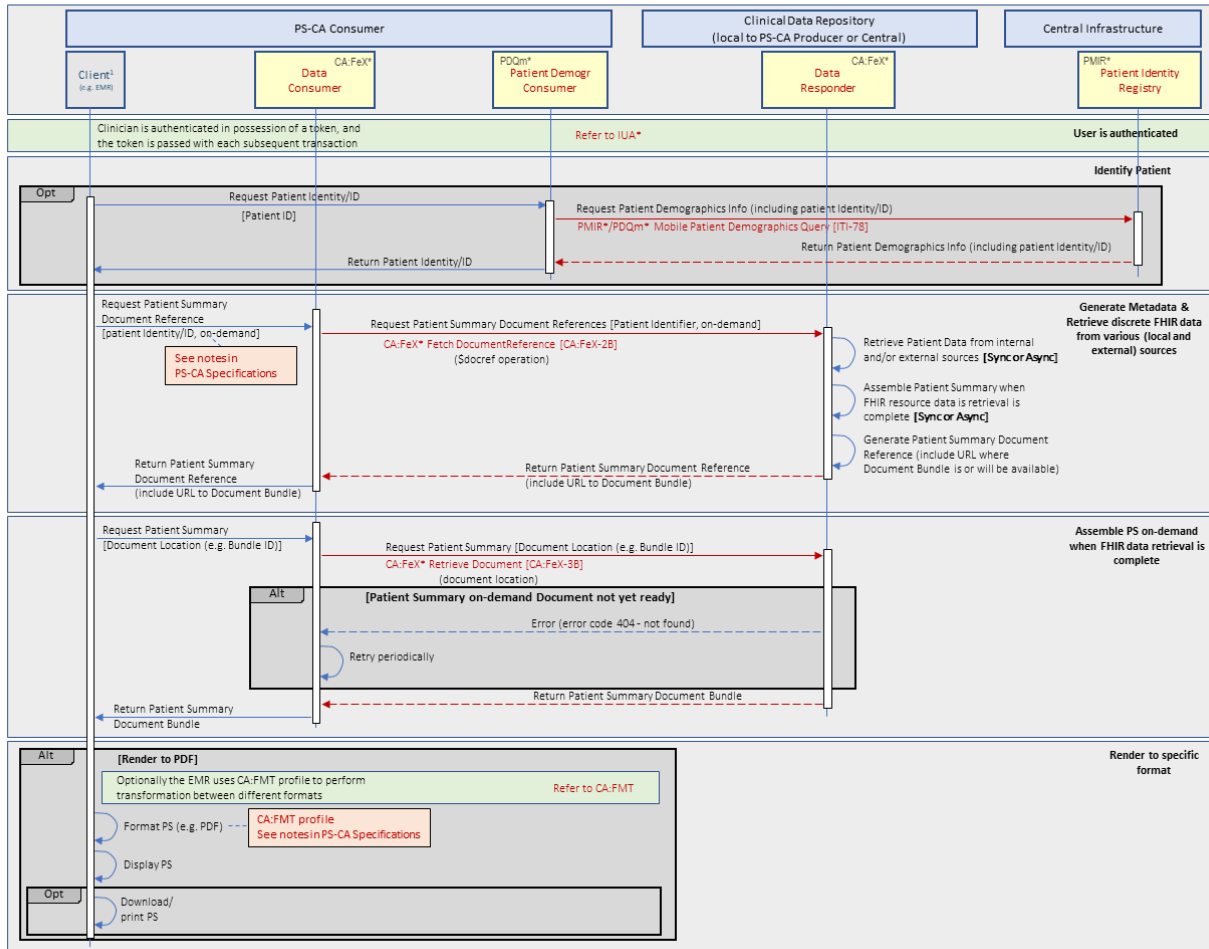
Sequence Diagram Overview:

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 4 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 Reference Architecture.

UC-04 HCP Requests PS-CA On Demand – CA:FeX $docref

Clinical Solution A Requests PS on demand from Clinical Data Repository

Clinical FHIR Data Sources are internal and/or external to the Clinical Data Repository
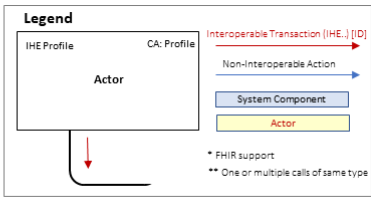
9 Sequence Diagrams for UC-05: Patient Mediated Access and Exchange of their Patient Summary

This section provides a summary of the sequence diagram for Use Case-05:

Use Case-05: Patient Mediated Access and Exchange of their Patient Summary

This use case describes the process of accessing and sharing a Patient Summary using a Shareable Health Link (SHL) and QR code. It is split into two distinct parts (Part A: Patient Requests Access to Their Shareable Patient Summary and Part B: Patient presents their QR code or SHL to HCP for access to their Patient Summary), offering a complete overview of the workflow from the creation of the shareable Patient Summary to its use by Health Care Providers (HCP).

Part A: Patient Requests Access to Their Shareable Patient Summary

This part of the use case is focused on the scenario where the patient is requesting generation of a Shareable Health Link that enables Patient Mediated Access to their Patient Summary.

Part B: Patient presents their QR code or SHLink to HCP for access to their Patient Summary

This part of the use case is focused on the scenario where the Health Care Provider using their clinical system, consumes the Shareable Health Link that was presented by the patient, and retrieves their Patient Summary.

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-78 transaction can be used to show the patient identification using IHE PDQm/PMR profiles, or ITI-83 transaction if the preferred implementation pattern is PIXm/PMIR.

9.1 UC-05A: Generate SHLink for Patient Summary

Scenario: Patient-facing application (Mobile App, Patient Portal, or proprietary Patient Viewer Application) requests access to a shareable copy of their Patient Summary in SHLink format.

Assumption: The Patient Summary either exists or is generated on demand. This step occurs prior and is transparent to the SHLink generation.

Implementation Option: This sequence diagram provides the option of using the CA:SHL Interoperability Specifications that provide support for requesting generation of a Shareable Health Link to their Patient Summary from a Clinical Data Repository. This profile includes an SHLink Requester and an SHLink Creator actor. Additionally, this sequence diagram uses the 'Generate SHLink' CA:SHL-1 transaction.

The server-side generates the SHLink and upon receival, the SHLink is typically converted in a QR code format, that can be downloaded by the patient and saved onto their phone or other media. The SHLink optionally contains a viewer URL that is recognizable by a browser and can display information related to the SHLink.

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 5 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, if present, describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes the CA:SHL 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 Reference Architecture.

UC-05A Patient Requests Generation of SHLink for PS-CA – CA:SHL
Client Application Requests SHLink from Clinical Data Repository
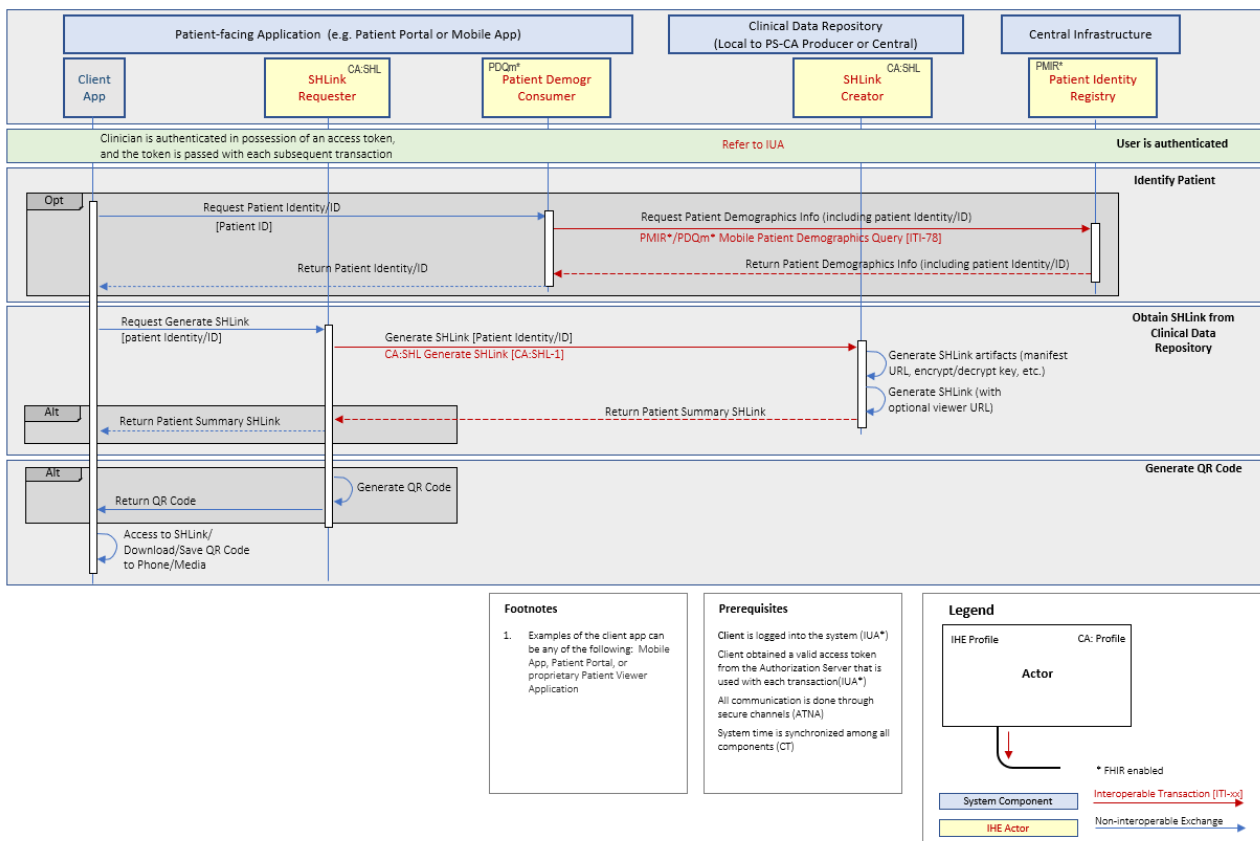
9.2 UC-05B: Consume SHLink and Access Patient Summary

Scenario: Clinical Solution A decodes SHLink and Retrieves Patient Summary from Document Repository.

Assumption: The Patient Summary is encrypted and either pre-prepared and stored in a secure location, or made available when the SHLink is accessed and the data is requested. As a prerequisite, the patient shares the passcode

with the HCP to allow accessing the Patient Summary associated with the SHLink. Typically the HCP is authenticated in their clinical system such as an EMR or HIS.
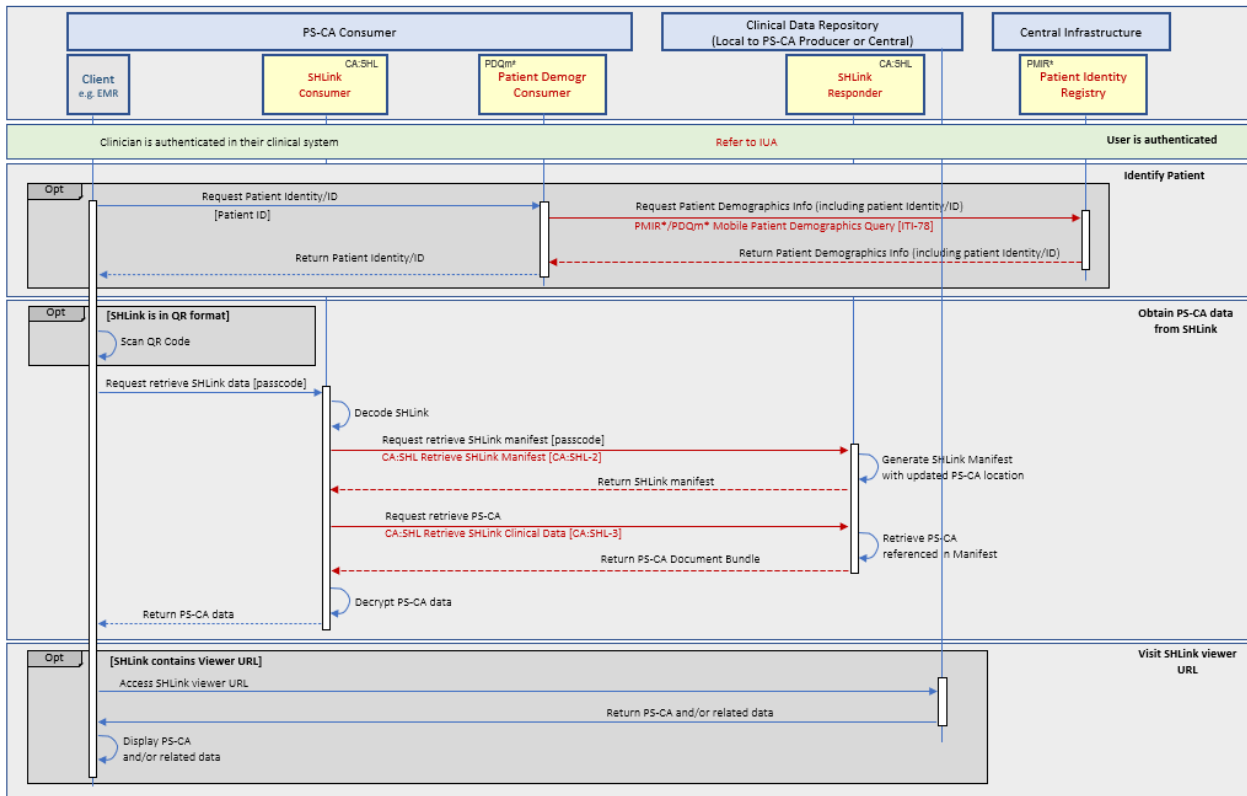
Implementation Option: This sequence diagram provides the option of using the CA:SHL Interoperability Specifications that provide support for consuming a Shareable Health Link associated with a Patient Summary. This profile includes an SHLink Consumer and an SHLink Responder actor. Additionally, this sequence diagram uses the 'CA:SHL Retrieve SHLink Manifest' CA:SHL-2 transaction to retrieve the manifest file and 'CA:SHL Retrieve SHLink Clinical Data' CA:SHL-3 transaction to retrieve the Patient Summary document. The client-side consumer application has the capability of scanning QR codes, interpreting SHLinks and access encrypted data. The SHLink optionally contains a viewer URL that is recognizable by a browser and can display relevant information. A viewer might have the capability to consume the SHLink and display the Patient Summary, if the client application does not have the necessary capabilities. The location where the Patient Summary is available for access must be short-lived and and potentially limited to one-time use.

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 5 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, if present, describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes the CA:SHL 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 Reference Architecture.

UC-05B HCP Consumes PS-CA SHLink – CA:SHL
Clinical Solution Decodes SHLink and Retrieves PS-CA

PS-CA Consumer	

PS-CA Consumer
- Client e.g. EMR
- SHLink Consumer (CA:SHL)
- Patient Demogr Consumer (PDQm*)

Clinical Data Repository (Local to PS-CA Producer or Central)
- SHLink Responder (CA:SHL)

Central Infrastructure
- Patient Identity Registry (PMIR*)

Clinician is authenticated in their clinical system — Refer to IUA — User is authenticated

Identify Patient
- Opt
  - Request Patient Identity/ID [Patient ID]
  - Request Patient Demographics Info (including patient Identity/ID) — PMIR*/PDQm* Mobile Patient Demographics Query [ITI-78]
  - Return Patient Demographics Info (including patient Identity/ID)
  - Return Patient Identity/ID

Obtain PS-CA data from SHLink
- Opt
  - [SHLink is in QR format]
  - Scan QR Code
  - Request retrieve SHLink data [passcode]
  - Decode SHLink
  - Request retrieve SHLink manifest [passcode] — CA:SHL Retrieve SHLink Manifest [CA:SHL-2]
  - Generate SHLink Manifest with updated PS-CA location
  - Return SHLink manifest
  - Request retrieve PS-CA — CA:SHL Retrieve SHLink Clinical Data [CA:SHL-3]
  - Retrieve PS-CA referenced in Manifest
  - Return PS-CA Document Bundle
  - Decrypt PS-CA data
  - Return PS-CA data

Visit SHLink viewer URL
- Opt
  - [SHLink contains Viewer URL]
  - Access SHLink viewer URL
  - Return PS-CA and/or related data
  - Display PS-CA and/or related data

Footnotes

1. Examples of the client app can be any of the following: Mobile App, Patient Portal, or proprietary Patient Viewer Application

Legend

IHE Profile	CA: Profile
Actor	

* FHIR enabled

| System Component | Interoperable Transaction [ITI-xx] |
| IHE Actor | Non-interoperable Exchange |

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