Integrating the Healthcare Enterprise

IHE PCC
Technical Framework Supplement

Query for Existing Data for Mobile (QEDm)

HL7® FHIR® Release 4

Using FHIR Resources at FMM Levels 2-Normative

Rev. 2.3 – Trial Implementation

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Please verify you have the most recent version of this document. See here for Trial Implementation and Final Text versions and here for Public Comment versions.

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Foreword

This is a supplement to the IHE Patient Care Coordination Technical Framework. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on February 8, 2022 for trial implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the Patient Care Coordination Technical Framework. Comments are invited and can be submitted at PCC Public Comments.

This supplement describes changes to the existing technical framework documents.

"Boxed" instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

Amend Section X.X by the following:

Where the amendment adds text, make the added text **bold underline**. Where the amendment removes text, make the removed text ~~**bold strikethrough**~~. When entire new sections are added, introduce with editor's instructions to "add new text" or similar, which for readability are not bolded or underlined.

General information about IHE can be found at IHE.

Information about the IHE Patient Care Coordination domain can be found at IHE Domains.

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at Profiles and IHE Process

The current version of the IHE Patient Care Coordination Technical Framework can be found at Patient Care Coordination Technical Framework.

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Introduction to this Supplement

Whenever possible, IHE profiles are based on established and stable underlying standards. However, if an IHE domain determines that an emerging standard has high likelihood of industry adoption, and the standard offers significant benefits for the use cases it is attempting to address, the domain may develop IHE profiles based on such a standard. During Trial Implementation, the IHE domain will update and republish the IHE profile as the underlying standard evolves.

Product implementations and site deployments may need to be updated in order for them to remain interoperable and conformant with an updated IHE profile.

This QEDm Profile incorporates content from Release 4 of the emerging HL7® FHIR® specification. HL7 describes FHIR Change Management and Versioning at https://www.hl7.org/fhir/versions.html.

HL7 provides a rating of the maturity of FHIR content based on the FHIR Maturity Model (FMM): level 0 (draft) through N (Normative). See http://hl7.org/fhir/versions.html#maturity.

The FMM levels for FHIR content used in this profile are:

FHIR Content	FMM Level
AllergyIntolerance	3
Bundle	N
Condition	3
DiagnosticReport	3
Encounter	2
Immunization	3
Medication	3
MedicationRequest	3
MedicationStatement	3
Observation	N
OperationOutcome	N
Patient	N
Procedure	3
Provenance	3

The Query for Existing Data for Mobile Profile (QEDm) supports dynamic queries for clinical data elements, including observations, allergy and intolerances, problems, diagnostic results, medications, immunizations, procedures, encounters and provenance by making the information widely available to other systems within and across enterprises to support provision of better

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clinical care. It defines a transaction used to query a list of specific data elements, persisted as FHIR resources.

QEDm is functionally equivalent to the QED Profile (based on HL7v3), but QEDm is better suited for implementation by application on mobile devices or where the http/REST technology is preferred. The term "mobile" must be understood in a wide sense: it refers not only to applications on devices used for mobility that are resource- and platform-constrained. (e.g., tablets, smartphones, and embedded devices including home-health devices), but also to larger systems deployed in environments where interoperability requirements are simple, such as pulling the latest summary for display.

The Query for Existing Data for Mobile (QEDm) Profile defines a standardized interface to health (HTTP-based RESTful APIs) suited for deployment of mobile applications on resource-constrained devices with simple programming environment (e.g., JavaScript), simple protocol stack (e.g., HTTP), and simple display functionality (e.g., HTML browser). The goal is to limit required additional libraries that are often necessary to process SOAP, MIME-Multipart, MTOM/XOP Web Services.

The Query for Existing Data for Mobile Profile (QEDm) Profile, uses the already defined actors Clinical Data Consumer and Clinical Data Source, for which it specifies option and a transaction to be used for querying a list of specific data elements, persisted as FHIR resources. The current version of Supplement doesn't consider the reconciliation of the fine-grained data elements gathered by the Clinical Data Source and/or Clinical Data Consumer Actors. In order to perform reconciliation a grouping with RECON Reconciliation Agent should be considered.

The QEDm Profile may also be deployed in conjunction with document sharing profiles such as MHD or XDS Profiles. The Document Provenance Option in QEDm is used in particular by the mXDE Profile to address the combined deployment of QEDm for access to fine-grained data element with links to source documents accessible through the MHD or XDS Profiles.

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Open Issues and Questions

QEDm_012: Currently QEDm does not constrain the FHIR Resources. This has been deliberately done due to the limited experience (Trial Implementation) with these FHIR Resources. There will be an effort during the spring and summer of 2019 to add constraints on the FHIR Resources. These constraints will be international, with support for Volume 4 regional constraints. These constraints will be based on original QED use-cases, original QED constraints, HL7 Implementation Guide for US-Core, and regional experience. All are encouraged to participate in this effort. Participate by joining the PCC technical workgroup, and by interacting with the GitHub https://github.com/IHE/QEDm.

Should future releases of the HL7 FHIR profile for ODH be modified as International Realm, this profile will be updated to point to those updated profiles. The scope of the modifications in the IHE ODH profiles is to reference 'Patient' instead of US Core Patient, and to reference the 3 US-Centric value sets with binding of 'example' rather than 'required':

- Occupation
- Industry
- Supervisory Level or Pay Grade

Occupation, Industry, and Work Classification value sets may vary by jurisdiction. The US CDC census valuesets are provided as an 'example binding'. There is no apparent specification for an expression of 'concept domain', which is leveraged by multiple IHE QRPH and PCC profiles as a method to allow for jurisdictions to specify other value sets.

Closed Issues

QEDm_011: For the Medications Option, should we add split in two distinct options and add a specific query to the Medication Resource?

- In the current specification, the Medication Option includes both queries for the medication request and the medication statement. It was discussed if those should each be a distinct option.

Resolution:

⇨ **In the trial implementation version of this profile, it was decided to keep those as a single option and consider implementers feedback if they need to be split.**

- Current specification allows to retrieve the Medication Resource related to each MedicationRequest or MedicationStatement by performing a query by 'patient' for those resources and by supporting the "_include" of the related Medication into the returned Bundle. It was discussed the need to include a specific query for the Medication Resource, along with query parameters for searching on Medication such as: code, ingredient, container, form…

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Resolution:

⇨ **It was decided in the Trial implementation version to not include a specific query for the Medication Resource and consider implementer's feedback if such a query was needed.**

QEDm_001: Agree on the list of requirements for QEDm by comparing with QED

Resolution:

	Requirements	QED	QEDm
1	Support listing of Problems, Medications, Allergies, Med-Allergies	Yes	Yes By using the FHIR Condition Resource
2	Supports listing of rest of DE (Data-element) per full QED List	Yes	Yes
3	Supports listing of additional DE per DAF (Access Framework) resources	No	Yes, almost
4	Supports access to DE across DAF/US Core defined resources	No	To be decided
5	Identifies source documents from where DE was extracted, if any.	Yes (but not clearly)	Yes
6	Selects source documents for scope of query	No	Yes
7	Flag in response that auto de-duplication has happen by clinical DE source	No	No (Closed Issue)
8	Shows specific DEs that have been auto de-duplicated	No? (not with RECON)	No, too complex

QEDm_002: Scope Listing of Data Elements

Which is the best approach in specifying the QEDm query transaction and complementary provenance information?

FHIR allows essentially two approaches (querying strategies in FHIR STU3):

⇨ *Querying 'named' Lists of resources ('Operations')*

⇨ *Querying directly the underlying resources*

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Considerations:

- ⇨ *Only the support for listing Resources has sense from a clinical point of view (see Issue QEDm:001 - requirements 1,2,3)*
- ⇨ *FHIR List resource enumerates a flat collection of resources and provides features for managing the collection. While a particular List instance may represent a "snapshot", from a business process perspective the notion of "List" is dynamic – items are added and removed over time. The list resource references other resources. Lists may be curated and have specific business meaning (see here for more comments).*

Resolution:

- ⇨ ***Basic remains the goal and Argonauts doesn't consider 'curated lists' (aka 'named' Lists of resources) as a basic function → start consider querying directly the underlying resources***

QEDm_003: which are the QEDm query parameters to consider for accessing Data Elements (Resources)?

Resolution:

- ⇨ ***try to replicate QED functionalities according to the query strategy adopted.***

QEDm_004: To define the core set of FHIR resources that align with QED and related QEDm's options

Resolution strategy:

- ⇨ *consider a subset of FHIR Resources: the stable ones.*
  (keep in the Supplement the complete table to make evident all open issues about Resources until the final review: see "Classification of Information" section for more details)
- ⇨ *consider the STU3 version of Resources.*

Comments:

Here below a comparison table between the current clinical information classification/options from QED, QEDm and FHIR Resources.

Alternative classifications from Argonauts and US Core projects/initiatives have been considered and discussed.

QED Option	QEDm Option	FHIR Resource/Profile
Vital Signs	Simple Observations	Observation (Vital Signs are profiled Observations)

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QED Option	QEDm Option	FHIR Resource/Profile
Diagnostic Results	Diagnostic Results Option	DiagnosticReport
Problems and Allergies	Allergy and Intolerances	AllergyIntolerance
	Conditions	Condition
Medications	Medications	Medication MedicationStatement MedicationRequest
Immunizations	Immunizations	Immunization
Professional Services	Procedures	Procedures
	Encounters	Encounter
	Provenance	Provenance
		Goals → not considered
		Assessment and Plan → not considered
		CareTeam → not considered
		Practitioner → not considered
		Organization → not considered
		Location → not considered

Resolution:

⇨ ***Only a core-set of FHIR resources will be considered, consequently only a limited number of options are going to be specified. See the table above.***

QEDm_005: Managing reconciliation of Data Elements

How to record reconciliation performed on the FHIR resources returned by the QEDm query transaction?

Considerations:
Reconciliation of clinical data without a manual intervention has no sense.
An automatic algorithm could work well if limited to the data deduplication.

Consequences:

- *a 'manual reconciliation' can be conceived at the Clinical Data Consumer side and it's necessary when this actor is going to perform multiple query for gathering and merging information from different sources → the reconciliation is obtained by considering a Reconciliation Agent grouped with it.*
- *an 'automatic deduplication' can be conceived as option for the Clinical Data Source*

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Reconciliation/deduplication specific content is already defined by RECON. The results of reconciliation are noted in the FHIR List resource by using the FHIR Provenance resource. See the following two sections:

- *PCC Vol.3: 6.6.A - FHIR Reconciled List*
- *PCC Vol.3: 6.6.B - FHIR Provenance Constraints*

BUT:

⇨ *RECON specifications must be updated to FHIR STU3*

⇨ *See also considerations about multi-stage import/reconciliation supported by the Provenance Resource: http://hl7.org/fhir/2017Jan/provenance.html#6.2.4.6*

Resolution:

⇨ ***too complex, no reconciliation and no deduplication will be considered by QEDm (no automatic operations specified by RECON Profile)***

QEDm_006: new name for the [PCC-44] transaction: "Mobile Query Existing Data"?

In order to appear more generic, it's proposed to use the name "Mobile Query Existing Data" for the transaction [PCC-44] to be aligned with the QED [PCC-2] "Query Existing Data" transaction, just like done with PIX/PIXm and PDQ/PDQm

Resolution:

⇨ ***ok to rename.***

QEDm_007: How to consider the "Multi-Patient Query Option" in the query transaction?

Resolution:

⇨ ***ok to remove this option from this year scope***

QEDm_008: Consistency – How to identify Document Sources of Data Elements

Strategy:

Consider the FHIR Provenance resource as used in PCC-RECON: "When the Data Element comes from a Document, the ID of the document is used as the source. When the Data Element is the result of a query (such as QED), the query ID is the source.

When the data comes directly from a system, provenance may not exist because there is not a document source ID from the system. The solution is to start broad and add the "provenance" Option (source of the data). …"

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Resolution:

- ⇨ ***The original Document(s) reference(s) can be supported by the Provenance.entity: http://hl7.org/fhir/STU3/provenance.html (in general each Provenance object can link N 'target' Resources to M 'entity' Documents)***
- ⇨ ***To consider also the available FHIR specifications on FHIR & XDS Documents https://www.hl7.org/FHIR/STU3/usecases.html#xds***
  - ***specifically, the DocumentReference FHIR resource: https://www.hl7.org/FHIR/STU3/documentreference.html***
- ⇨ ***Additional considerations on query for including Provenance:***
  - ***FHIR query on "resource" (e.g., medication), add "_revinclude" with "Provenance". GET [base]/MedicationRequest?_revinclude=Provenance:target&criteria...Always on the GET by client and server must support.***
  - ***For list FHIR is an "operation" (not RESTful GET). Is it worth exposing "list operations" because may be perfectly reconciled.***
  - ***Use Doc Resource versus and/or provenance resource***

QEDm_009: QED retirement

Resolution:

- ⇨ ***it may be considered, but the timing is independent of QEDm completion.***

QEDm_010: Which is the best FHIR Implementation Guide to refer?

- Should we move to US-Core? Are they other countries/international efforts?
- Alternative is Argonaut (modified, by removing a few US specific).

Considerations:

- ⇨ STU 3 'final' has been released and the US Core IG has been aligned to STU3

Resolution:

- ⇨ ***No need to base the whole profile on US Core specific constrains. US Core resource specific profiling or other profiling can be referenced only if/when necessary***

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IHE Technical Frameworks General Introduction

The IHE Technical Framework General Introduction is shared by all of the IHE domain technical frameworks. Each technical framework volume contains links to this document where appropriate.

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IHE Technical Frameworks General Introduction Appendices

The IHE Technical Framework General Introduction Appendices are components shared by all of the IHE domain technical frameworks. Each technical framework volume contains links to these documents where appropriate.

*Update the following appendices to the General Introduction as indicated below. Note that these are **not** appendices to this domain's Technical Framework (TF-1, TF-2, TF-3 or TF-4) but rather, they are appendices to the IHE Technical Frameworks General Introduction located here.*

Appendix A – Actors

*Add the following **new or modified** actors to the IHE Technical Frameworks General Introduction Appendix A:*

Actor	Definition
No new actors	

Appendix B – Transactions

*Add the following **new or modified** transactions to the IHE Technical Frameworks General Introduction Appendix B:*

New (or modified) Transaction Name and Number	Definition
Mobile Query Existing Data [PCC-44]	This transaction uses RESTful API to query clinical data elements and retrieve them as sets of FHIR resources.

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Appendix D – Glossary

*Add the following **new or modified** glossary terms to the IHE Technical Frameworks General Introduction Appendix D:*

Glossary Term	Definition
No new terms	

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Volume 1 – Profiles

Copyright Licenses

Add the following to the IHE Technical Frameworks General Introduction Copyright section:

No new copyright licenses added.

Add new Section X

X Query for Existing Data for Mobile (QEDm) Profile

The Query for Existing Data for Mobile Profile (QEDm) supports queries for clinical data elements, including observations, allergy and intolerances, conditions, diagnostic results, medications, immunizations, procedures, encounters and provenance by making the information widely available to other systems within and across enterprises. It defines a transaction used to query a list of specific data elements, persisted as FHIR resources.

QEDm is functionally equivalent to the QED Profile, but it is better suited for implementation by application on mobile devices. The term "mobile" must be understood in a wide sense: it refers not only to applications on devices used for mobility that are resource- and platform-constrained. (e.g.: tablets, smartphones, and embedded devices including home-health devices), but also to larger systems deployed in environments where interoperability requirements are simple, such as pulling the latest summary for display.

The Query for Existing Data for Mobile (QEDm) Profile defines a standardized interface to health (HTTP-based RESTful APIs) suited for deployment of mobile applications on resource-constrained devices with simple programming environment (e.g., JavaScript), simple protocol stack (e.g., HTTP), and simple display functionality (e.g., HTML browser). The goal is to limit required additional libraries that are often necessary to process SOAP, MIME-Multipart, MTOM/XOP Web Services.

The QEDm Profile may also be deployed in conjunction with document sharing profiles such as MHD or XDS Profiles. The Document Provenance Option in QEDm is used in particular by the mXDE Profile to address the combined deployment of QEDm for access to fine-grained data element with links to source documents accessible through the MHD or XDS Profiles.

X.1 QEDm Actors, Transactions and Content Modules

This section defines the actors, transactions, and/or content modules in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A at http://ihe.net/Technical_Frameworks.

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Figure X.1-1 shows the actors directly involved in the QEDm Profile and the relevant transaction between them.

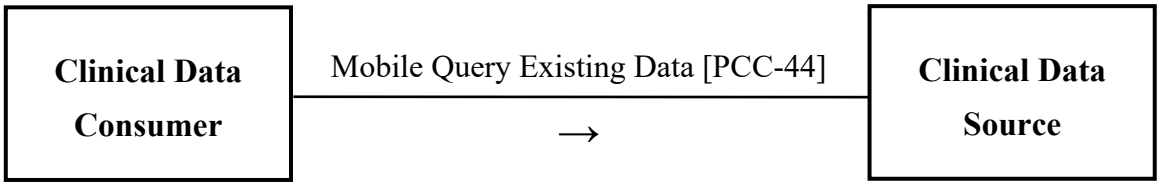

Figure X.1-1: QEDm Actor Diagram

Table X.1-1 lists the transactions for each actor directly involved in the QEDm Profile. To claim compliance with this profile, an actor shall support all required transactions (labeled "R") and may support the optional transactions (labeled "O").

Table X.1-1: QEDm Integration Profile - Actors and Transactions

Actors	Transactions	Optionality	Reference
Clinical Data Source	Mobile Query Existing Data [PCC-44]	R	PCC TF-2: 3.44
Clinical Data Consumer	Mobile Query Existing Data [PCC-44]	R	PCC TF-2: 3.44

X.1.1 Actor Descriptions and Actor Profile Requirements

X.1.1.1 Clinical Data Source

The Clinical Data Source in this profile responds to FHIR-based queries for one or more fine-grained data elements (FHIR resources) defined by the options listed in Section X.2.

X.1.1.2 Clinical Data Consumer

The Clinical Data Consumer in this profile sends FHIR-based queries to the Clinical Data Source for one or more fine-grained data elements (FHIR resources) defined by the options listed in Section X.2. Rendering or further processing of the data is not defined by this profile.

X.2 QEDm Actor Options

Options that may be selected for each actor in this profile, if any, are listed in the Table X.2-1. Dependencies between options when applicable are specified in notes.

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Table X.2-1: QEDm - Actors and Options

Actor	Option Name	Reference
Clinical Data Consumer	Simple Observations Option (1)	PCC TF-1: X.2.1.1
	Allergies and Intolerances Option (1)	PCC TF-1: X.2.1.2
	Conditions Option (1)	PCC TF-1: X.2.1.3
	Diagnostic Results Option (1)	PCC TF-1: X.2.1.4
	Medications Option (1)	PCC TF-1: X.2.1.5
	Immunizations Option (1)	PCC TF-1: X.2.1.6
	Procedures Option (1)	PCC TF-1: X.2.1.7
	Encounters Option (1)	PCC TF-1: X.2.1.8
	Document Provenance Option	PCC TF-1: X.2.1.9
	Occupational Data for Health Option (1)	PCC TF-1: X.2.1.10
Clinical Data Source	Simple Observations Option (1)	PCC TF-1: X.2.2.1
	Allergies and Intolerances Option (1)	PCC TF-1: X.2.2.2
	Conditions Option (1)	PCC TF-1: X.2.2.3
	Diagnostic Results Option (1)	PCC TF-1: X.2.2.4
	Medications Option (1)	PCC TF-1: X.2.2.5
	Immunizations Option (1)	PCC TF-1: X.2.2.6
	Procedures Option (1)	PCC TF-1: X.2.2.7
	Encounters Option (1)	PCC TF-1: X.2.2.8
	Document Provenance Option	PCC TF-1: X.2.2.9
	Occupational Data for Health Option (1)	PCC TF-1: X.2.1.10

Note 1: At least one of these options shall be supported by the related actor.

X.2.1 Clinical Data Consumer Options

X.2.1.1 Simple Observations Option

A Clinical Data Consumer that implements the Simple Observations Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Simple Observations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.1.

X.2.1.2 Allergies and Intolerances Option

A Clinical Data Consumer that implements the Allergies and Intolerances Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Allergies and Intolerances in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.2.

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X.2.1.3 Conditions Option

A Clinical Data Consumer that implements the Conditions Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Conditions in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.3.

X.2.1.4 Diagnostic Results Option

A Clinical Data Consumer that implements the Diagnostic Results Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Diagnostic Results in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.4.

X.2.1.5 Medications Option

A Clinical Data Consumer that implements the Medications Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Medications in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.5.

X.2.1.6 Immunizations Option

A Clinical Data Consumer that implements the Immunizations Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Immunizations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.6.

X.2.1.7 Procedures Option

A Clinical Data Consumer that implements the Procedures Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Procedures in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.7.

X.2.1.8 Encounters Option

A Clinical Data Consumer that implements the Encounters Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Encounters in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.8.

X.2.1.9 Document Provenance Option

This option is different than the above options that allow the selection of appropriate clinical content to query. It provides a means to extend the traceability of information used for clinical decisions: when a data element is accessed by a Clinical Data Consumer, identifiers from that data element can be retrieved to enable access to one or more documents in which this data element was originally recorded, providing a valuable broader clinical context.

A Clinical Data Consumer that implements the Document Provenance Option performs the Mobile Query Existing Data transaction using the vocabulary specified for Provenance in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.9.

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X.2.1.10 Occupational Data for Health Option

A Clinical Data Consumer that implements the Occupational Data for Health Option

performs the Mobile Query Existing Data transaction using the vocabulary specified for Occupational Data for Health in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.10.

X.2.2 Clinical Data Source Options

X.2.2.1 Simple Observations Option

A Clinical Data Source that implements the Simple Observations Option responds to the message semantics specified for Simple Observations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.1.

X.2.2.2 Allergies and Intolerances Option

A Clinical Data Source that implements the Allergies and Intolerances Option responds to the message semantics specified for Allergies and Intolerances in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.2.

X.2.2.3 Conditions Option

A Clinical Data Consumer that implements the Conditions Option responds to the message semantics specified for Conditions in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.3.

X.2.2.4 Diagnostic Results Option

A Clinical Data Source that implements the Diagnostic Results Option responds to the message semantics specified for Diagnostic Results in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.4.

X.2.2.5 Medications Option

A Clinical Data Source that implements the Medications Option responds to the message semantics specified for Medications in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.5.

X.2.2.6 Immunizations Option

A Clinical Data Source that implements the Immunizations Option responds to the message semantics specified for Immunizations in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.6.

X.2.2.7 Procedures Option

A Clinical Data Source that implements the Procedures Option responds to the message semantics specified for Procedures in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.7.

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X.2.2.8 Encounters Option

A Clinical Data Source that implements the Encounters Option responds to the message semantics specified for Encounters in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.8.

X.2.2.9 Document Provenance Option

This option is different than the above options that allow the selection of appropriate clinical content to query. It provides a means to extend the traceability of information used for clinical decisions: when a data element is accessed by a Clinical Data Consumer, identifiers from that data element can be provided to the Clinical Data Consumer to enable access to one or more documents in which this data element was originally recorded, providing a valuable broader clinical context.

A Clinical Data Source that implements the Document Provenance Option responds to the message semantics specified for Provenance in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.9.

X.2.2.10 Occupational Data for Health Option

A Clinical Data Source that implements the Occupational Data for Health Option responds to the message semantics specified for Occupational Data for Health in [PCC-44] in PCC TF-2: 3.44.4.1.2.1.10 with the profiled content specified in the Reference link location.

X.3 QEDm Required Actor Groupings

Table X.3-1: QED for Mobile - Required Actor Groupings

QEDm Actor	Actor to be grouped with	Reference
Clinical Data Consumer	None	-
Clinical Data Source	None	-

X.4 QEDm Overview

X.4.1 Concepts

The QEDm Profile supports a broad set of the QED use cases and functionality while keeping the implementation as simple as possible.

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X.4.2 Use Cases

X.4.2.1 Use Case #1: Discovery and Retrieval of existing data elements

X.4.2.1.1 Use Case #1 Description

In this use case, the patient, by using a mobile device, needs access to existing data elements. For example, a mobile application involved in a workflow needs to discover all the current Observations and Medications.

X.4.2.1.2 Use Case #1 Process Flow

The Mobile Query Existing Data transaction is used to provide parameterized queries that result in a list of returned data elements.

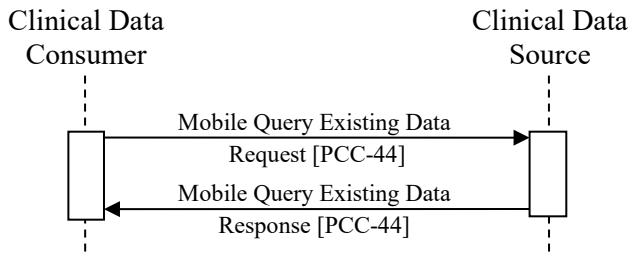

Figure X.4.2.1.2-1: Use Case #1 Process Flow in QEDm Profile

X.4.2.2 Use Case #2: Discovery and Retrieval of existing data elements with source document links

X.4.2.2.1 Use Case #2 Description

In this use case, the physician, by using a mobile device, needs to access all existing data elements and eventually to retrieve and consume the source documents if any.

For example, a mobile application involved in a workflow needs to discover all Encounters which the patient has participated in and, for those of interest, it needs to retrieve and show the related document where the Encounter was originally specified,

X.4.2.2.2 Use Case #2 Process Flow

The Query for Existing Data for Mobile transaction is used to provide parameterized queries that result in a list of returned data elements. One of the query options specifies that provenance information must be included in the result to obtain the links to source documents, if any.

The mobile application implements The Clinical Data Consumer to perform the query.

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The mobile application also implements an MHD Document Consumer and retrieves the document from the MHD Document Responder by using the related returned document link.

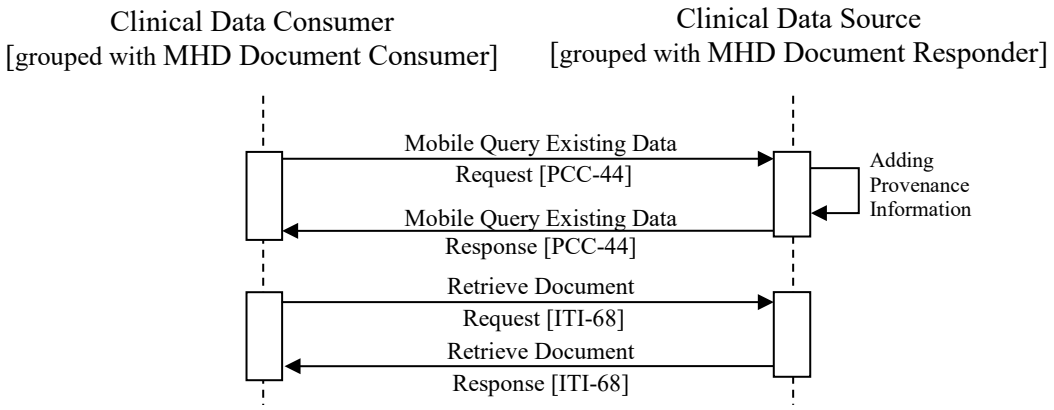

Figure X.4.2.2.2-1: Use Case #2 Process Flow in QEDm Profile

X.5 QEDm Security Considerations

See ITI TF-2.x Appendix Z.8 “Mobile Security Considerations” for general background on “Mobile” security considerations, and recommendations regarding security.

The QEDm Profile provides an API for accessing Data Element level details that are identifiable to a specific Patient. Thus, all the data communicated, including the query parameters, should be considered Patient Identifiable data. The grouping with IUA, or some similar User Authentication and Authorization solution, is critical to enforcing Privacy and Security. All accesses to this data should be recorded as audit log for security surveillance and Privacy reporting. These topics are discussed in Appendix Z.8 with recommendations.

The Document Provenance Option adds an additional protection against Data Integrity and Data Authenticity risks. The Provenance record associated with a Data Element returned by the Clinical Data Source would indicate the source of the data. In the case where Provenance is specific to a Document, grouping with MHD Document Consumer or XDS Document Consumer enables the retrieval of that source Document. The mXDE Profile ITI TF-1:45.5 Security Considerations includes further discussion on the specific Security Considerations of bridging between a Document Sharing environment and a Data Element access model.

X.6 QEDm Cross Profile Considerations

ITI mXDE – Mobile Cross-Enterprise Document Data Element Extraction

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A Clinical Data Source may be grouped with a Data Element Extractor which requires the addition of necessary provenance information to ensure consistency within each returned data element.

This grouping allows the extraction of data elements and the addition of references to data origins (e.g., Documents) used in generating the result.

A Clinical Data Consumer may be grouped with a Data Element Provenance Consumer to extract the identifiers (provenance information) that consistently link the returned data elements to the related data origin.

ITI PIX - Patient Identity Cross Referencing and ITI PDQ - Patient Demographics Query

A Clinical Data Consumer may be grouped with a Patient Identifier Cross-reference Consumer or a Patient Demographics Consumer to resolve patient identifiers prior to submitting queries to a Clinical Data Source.

Within an enterprise, the need to cross-reference patient identifiers may not be necessary. However, once enterprise boundaries are crossed, these identifiers will need to be resolved. In that case profiles such as PIX, PIXm, PDQ and/or PDQm may be used.

ITI MHD – Mobile Health Documents

A Clinical Data Source may be grouped with an MHD Document Responder. Data gathered from clinical documents submitted to the Document Responder can be a source of information returned by the Clinical Data Source. It may include references to documents used in generating the QEDm returned data-elements, by using the FHIR Provenance Resource.

A Clinical Data Consumer may be grouped with an MHD Document Consumer. The Clinical Data Consumer may use the references to access the source documents.

ITI XDS - Cross-Enterprise Document Sharing

A Clinical Data Source may be grouped with an XDS Document Repository. Data gathered from clinical documents submitted to the Document Repository can be a source of information returned by the Clinical Data Source. Information returned by the Clinical Data Source may include references to all documents used in generating the results, by using the FHIR Provenance Resource.

Content Integration Profiles

A Content Creator may be grouped with a Clinical Data Consumer to obtain some or all of the information necessary to create a Medical Summary based on information found in a Clinical Data Source.

A Content Creator may be grouped with a Clinical Data Source. When grouped with a Content Creator, the Clinical Data Source shall respond to queries containing the relevant vocabulary codes used by the Content Creator.

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Volume 2 – Transactions

Add Section 3.44

3.44 Mobile Query Existing Data [PCC-44]

This section corresponds to transaction [PCC-44] of the IHE PCC Technical Framework. Transaction [PCC-44] is used by the Clinical Data Consumer and Clinical Data Source Actors.

3.44.1 Scope

The Mobile Query Existing Data transaction is used to query for fine grained clinical data elements that satisfy a set of parameters by using the FHIR framework. The result of the query is a FHIR Bundle containing FHIR clinical data Resources that match the query parameters.

The QEDm Profile assumes that categories and codes referenced by these FHIR Resources need to be defined at the time of deployment. The specification of these FHIR Resources make recommendations on categories and codes that should be considered.

3.44.2 Actor Roles

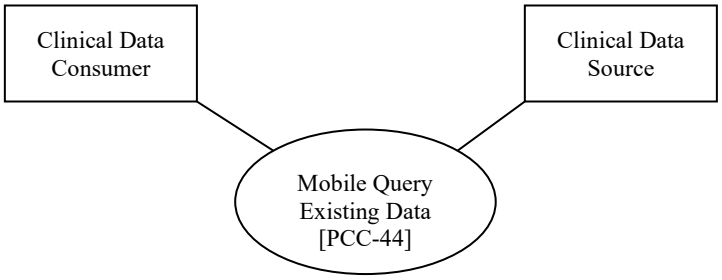

Figure 3.44.2-1: Use Case Diagram

Table 3.44.2-1: Actor Roles

Actor:	Clinical Data Consumer
Role:	Queries the Clinical Data Source for clinical data content. Clinical content requested by the Clinical Data Consumer depends on query options supported by the consumer.
Actor:	Clinical Data Source
Role:	Responds to query, supplying the FHIR Resources representing the clinical data content that match the search criteria provided by the Clinical Data Consumer.

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3.44.3 Referenced Standards

HL7 FHIR	HL7 FHIR standard Release 4: http://www.hl7.org/fhir/R4/index.html
IETF RFC2616	Hypertext Transfer Protocol – HTTP/1.1
IETF RFC7540	Hypertext Transfer Protocol – HTTP/2
IETF RFC3986	Uniform Resource Identifier (URI): Generic Syntax
IETF RFC4627	The application/json Media Type for JavaScript Object Notation (JSON)
IETF RFC6585	Additional HTTP Status Codes

3.44.4 Messages

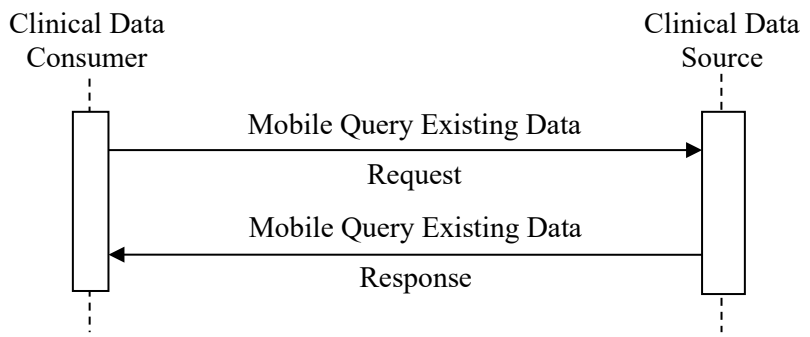

Figure 3.44.4-1: Interaction Diagram

3.44.4.1 Mobile Query Existing Data Request message

This message uses the HTTP GET method parameterized query to retrieve FHIR Resources representing clinical data matching search parameters in the GET request.

QEDm does not mandate any additional extended or custom method.

3.44.4.1.1 Trigger Events

When the Clinical Data Consumer needs to discover clinical data Resources matching various search parameters it issues a Mobile Query Existing Data message.

3.44.4.1.2 Message Semantics

The Clinical Data Consumer executes an HTTP GET against the proper Clinical Data Source's QEDm URL.

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The search target follows the FHIR http specification (http://hl7.org/fhir/R4/http.html), addressing the proper FHIR Resource type, according to the supported query options (see Section 3.44.4.1.2.1). The syntax of the FHIR query is:

```
GET [base]/[Resource-type]{?[parameters]}
```

with the following constraints:

- The `[base]` represents the Service Base URL
- The `[Resource-type]` represents the name of the FHIR Resource to consider (each option can involve one or more Resources), as specified in Section 3.44.4.1.2.1
- The `[parameters]` represents a series of encoded name-value pairs representing the filter for the query, as specified in Section 3.44.4.1.2.1, as well as control parameters to modify the behavior of the Clinical Data Source such as response format, or pagination. See ITI TF-2x: Appendix Z.6 for more details on response format.

3.44.4.1.2.1 Query Search Parameters

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 FHIR Resource type or types supported by the Clinical Data Consumer and Clinical Data Source are determined by a QEDm named option. An actor claiming named option is required to support the FHIR Resource types listed below. According to the supported option, the Clinical Data Consumer may query and the Clinical Data Source shall be capable of responding on the Resource types specified in Table X.3-2 by processing all the search parameters defined in the following sections.

The Clinical Data Source may choose to support additional query parameters beyond the subset defined by the profiling listed below, if done according to the core FHIR specification. Such additional parameters are considered out of scope for this transaction. The Clinical Data Source may ignore any additional parameter not specified in this transaction. See http://hl7.org/fhir/R4/search.html#errors.

Table 3.44.4.1.2.1-1: QEDm Options, FHIR Resources and Query Search Parameters

QEDm Actor Option	FHIR Resource Type	Reference	Search Parameters
Simple Observations	**Observation**	http://hl7.org/fhir/R4/observation.html	See Section 3.44.4.1.2.1.1
Allergies and Intolerances	**AllergyIntolerance**	http://hl7.org/fhir/R4/allergyintolerance.html	See Section 3.44.4.1.2.1.2

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QEDm Actor Option	FHIR Resource Type	Reference	Search Parameters
Condition	**Condition (See Note 1)**	http://hl7.org/fhir/R4/condition.html	See Section 3.44.4.1.2.1.3
Diagnostic Results	**DiagnosticReport**	http://hl7.org/fhir/R4/diagnosticreport.html	See Section 3.44.4.1.2.1.4
Medications	**Medication:**	http://hl7.org/fhir/R4/medication.html	See Section 3.44.4.1.2.1.5
	Medication Statement	http://hl7.org/fhir/R4/medicationstatement.html	
	Medication Request	http://hl7.org/fhir/R4/medicationrequest.html	
Immunizations	**Immunization**	http://hl7.org/fhir/R4/immunization.html	See Section 3.44.4.1.2.1.6
Procedures	**Procedure**	http://hl7.org/fhir/R4/procedure.html	See Section 3.44.4.1.2.1.7
Encounters	**Encounter**	http://hl7.org/fhir/R4/encounter.html	See Section 3.44.4.1.2.1.8
Provenance	**Provenance**	http://hl7.org/fhir/R4/provenance.html	See Section 3.44.4.1.2.1.9
Occupational Data for Health	**Observation (See Note 2)**	CombatZonePeriod	See Section 3.44.4.1.2.1.10
		EmploymentStatus	
		PastOrPresentJob	
		RetirementDate	
		UsualWork	

675 Note 1: The intended use of FHIR Condition resource includes recording of detailed information about conditions, problems or diagnoses recognized by a clinician.

Note 2: Definitions and vocabularies for these resources are available at the referenced link

Sections 3.44.4.1.2.1.1 through 3.44.4.1.2.1.10 detail the search parameters combinations to be
680 supported for each of the FHIR Resources designated by a named option.

See ITI TF-2.x: Appendix Z.10 “Profiling conventions for constraints on FHIR” for a description of terms used in the Optionality columns.

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3.44.4.1.2.1.1 Simple Observations Option Search Parameters

When supporting the Simple Observations Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be at least capable of processing the search parameters combinations as specified by the following table, according to the related optionality.

```
GET [base]/Observation?[parameters]
```

Table 3.44.4.1.2.1.1-1: Simple Observations Option Search Parameters

Parameters	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer (1)
patient + category	reference + token		R	O
patient + category + code	reference + token		R	O
patient + category + date	reference + token + date	date modifiers ‘ge’,‘le’,’gt’,’lt’	R	O
patient + category + code + date	reference + token + date	date modifiers ‘ge’,‘le’,’gt’,’lt’	O	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

3.44.4.1.2.1.2 Allergies and Intolerances Option Search Parameters

When supporting the Allergies and Intolerances Option, the Clinical Data Consumer shall supply and the Clinical Data Source shall be capable of processing the search parameter as specified by the following table.

```
GET [base]/AllergyIntolerance?[parameters]
```

Table 3.44.4.1.2.1.2-1: Allergies and Intolerances Option Search Parameters

Parameters	Type	Optionality	
		Clinical Data Source	Clinical Data Consumer
patient	reference	R	R

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3.44.4.1.2.1.3 Conditions Option Search Parameters

When supporting the Conditions Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters combinations as specified by the following table, according to the related optionality.

```
GET [base]/Condition?[parameters]
```

Table 3.44.4.1.2.1.3-1: Conditions Option Search Parameters

Parameters	Type	Optionality	
		Clinical Data Source	Clinical Data Consumer (1)
patient	reference	R	O
patient + category	reference + token	O	O
patient + clinical-status	reference + token	O	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

3.44.4.1.2.1.4 Diagnostic Reports Option Search Parameters

When supporting the Diagnostic Reports Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters combinations as specified by the following table, according to the related optionality.

```
GET [base]/DiagnosticReport?[parameters]
```

Table 3.44.4.1.2.1.4-1: Diagnostic Reposts Option Search Parameters

Parameters	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer (See Note 1)
patient + category	reference + token		R	O
patient + category + code	reference + token		R	O
patient + category + date	reference + token + date	date modifiers ‘ge’,‘le’,’gt’,’lt’	R	O
patient + category + code + date	reference + token + date	date modifiers ‘ge’,‘le’,’gt’,’lt’	O	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

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3.44.4.1.2.1.5 Medications Option Search Parameters

When supporting the Medications Option, the Clinical Data Consumer shall supply and the Clinical Data Source shall be capable of processing the search parameters as specified by the following tables.

The MedicationStatement and MedicationRequest resources can represent a medication, using an external reference to a Medication resource. If an external Medication Resource is used in a MedicationStatement or a MedicationRequest, it can be retrieved by using the _include search parameter.

There are no search parameters required for the Medication Resource.

For MedicationStatement:

```
GET [base]/MedicationStatement?[parameters]
```

Table 3.44.4.1.2.1.5-1: MedicationStatement Search Parameters

Parameters	Type	_include	Optionality	
			Clinical Data Source	Clinical Data Consumer
patient	reference	MedicationStatement:medication	R	R

For MedicationRequest:

```
GET [base]/MedicationRequest?[parameters]
```

Table 3.44.4.1.2.1.5-2: MedicationRequest Search Parameters

Parameters	Type	_include	Optionality	
			Clinical Data Source	Clinical Data Consumer
patient	reference	MedicationRequest:medication	R	R

3.44.4.1.2.1.6 Immunizations Option Search Parameters

When supporting the Immunizations Option, the Clinical Data Consumer may supply and the Clinical Data Source shall be capable of processing the search parameter as specified by the following table.

```
GET [base]/Immunization?[parameters]
```

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Table 3.44.4.1.2.1.6-1: Immunizations Option Search Parameters

Parameter	Type	Optionality	
		Clinical Data Source	Clinical Data Consumer
patient	reference	R	R

3.44.4.1.2.1.7 Procedures Option Search Parameters

When supporting the Procedures Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters as specified by the following table, according to the related optionality.

```
GET [base]/Procedure?[parameters]
```

Table 3.44.4.1.2.1.7-1: Procedures Option Search Parameters

Parameter	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer (1)
patient	reference		R	O
patient + date	reference + date	date modifiers ‘ge’,‘le’,’gt’,’lt’	R	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

3.44.4.1.2.1.8 Encounters Option Search Parameters

When supporting the Encounters Option, the Clinical Data Consumer supplies and the Clinical Data Source shall be capable of processing all the search parameters as specified by the following table, according to the related optionality.

```
GET [base]/Encounter?[parameters]
```

Table 3.44.4.1.2.1.8-1: Encounters Option Search Parameters

Parameter	Type	Modifiers	Optionality	
			Clinical Data Source	Clinical Data Consumer (1)
patient	reference		R	O
patient + date	reference + date	date modifiers ‘ge’,‘le’,’gt’,’lt’	R	O

Note 1: The Clinical Data Consumer shall support at least one of the search parameters combinations

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3.44.4.1.2.1.9 Document Provenance Option Search Parameters

Clinical Data Consumer supporting this option is enabled to fetch a certain FHIR Resource(s) together with any reference to the original Document from which the Resource(s) has been derived. The FHIR Provenance Resource containing those references can be included by providing the _revinclude parameter in the query.

When supporting the Document Provenance Option, the Clinical Data Consumer shall supply and the Clinical Data Source shall be capable of processing the _revinclude parameter, as defined at: https://www.hl7.org/fhir/R4/search.html#include

```
GET [base]/[Resource-type]?_revinclude=Provenance:target&criteria
```

See Section 3.44.4.2.2.1 for the specification about the Provenance content.

3.44.4.1.2.1.10 Occupational Data for Health Option Search Parameters

When supporting the Occupational Data for Health Option, the Clinical Data Consumer shall supply and the Clinical Data Source shall be capable of processing the search parameters as specified by the following tables.

For CombatZonePeriod:

```
GET [base]/observation?code=http://loinc.org|87511-2&patient=Patient/id
```

For EmploymentStatus:

```
GET [base]/observation?code=http://loinc.org|74165-2&patient=Patient/id
```

For PastOrPresentJob:

```
GET [base]/observation?code=http://loinc.org|11341-5&patient=Patient/id
```

For RetirementDate:

```
GET [base]/observation?code=http://loinc.org|87510-4&patient=Patient/id
```

For UsualWork:

```
GET [base]/observation?code=http://loinc.org|21843-8&patient=Patient/id
```

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3.44.4.1.2.2 Parameter Modifiers

The Clinical Data Source shall support the "`:exact`" parameter modifier on all query parameters of type string. When supplied by the Clinical Data Consumer, the "`:exact`" parameter modifier instructs the Clinical Data Source that exact matching shall be performed.

The Clinical Data Consumer should not use and Clinical Data Source may ignore any additional parameter modifiers listed in the FHIR standard, which are considered out of scope in the context of this transaction.

3.44.4.1.2.3 Populating Expected Response Format

The FHIR standard provides encodings for responses as either XML or JSON. The Clinical Data Source shall support both message encodings, whilst the Clinical Data Consumer shall support one and may support both.

See ITI TF-2x: Appendix Z.6 for details.

3.44.4.1.3 Expected Actions

The Clinical Data Source shall process the query to discover the clinical data FHIR Resource entries (the fine-grained data elements) that match the search parameters given and shall use a FHIR Bundle resource to collect the matching entries to be returned.

The Clinical Data Source shall respond with a Mobile Query Existing Data Response synchronously (i.e., on the same connection as was used to initiate the request).

When the Document Provenance Option is specified, the response FHIR Bundle shall also contain FHIR Provenance Resource entries that provide consistency of the returned fine-grained data elements with the coarse-grained data origin (e.g.: Document). See Section 3.44.4.2.2.1 for the specification about the Provenance content. If the fine-grained data element has not been extracted from a document, the Provenance Resource may be absent.

See ITI TF-2x: Appendix Z.6 for more details on response format handling. See ITI TF-2x: Appendix Z.7 for handling guidance for Access Denied.

3.44.4.2 Mobile Query Existing Data Response message

The Clinical Data Source returns an HTTP Status code appropriate to the processing as well as a list of the matching clinical data FHIR Resources.

3.44.4.2.1 Trigger Events

The Clinical Data Source completed processing of the Mobile Query Existing Data Request message.

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3.44.4.2.2 Message Semantics

Based on the query results, the Clinical Data Source will either return an error or success. The guidance on handling Access Denied related to use of 200, 403 and 404 can be found in ITI TF-2x: Appendix Z.7.

When the Clinical Data Source needs to report an error, it shall use HTTP error response codes and should include a FHIR OperationOutcome with more details on the failure. See FHIR http://hl7.org/fhir/R4/http.html and http://hl7.org/fhir/R4/operationoutcome.html.

In particular, if a Data Source receives a Mobile Query Existing Data transaction for a resource related to a QEDm Option not supported, it shall return an operationoutcome.issue.code valued as: ‘not-supported’ and an operationoutcome.issue.details valued as: MSG_NO_MATCH No Resource found matching the query "%s".

If the Mobile Query Existing Data request message is processed successfully, whether or not clinical data Resources are found, the HTTP status code shall be 200.

The Mobile Query Existing Data Response message shall be a FHIR Bundle Resource containing zero or more clinical data Resources plus optional Provenance Resources (see Section 3.44.4.2.2.1). If the Clinical Data Source is sending warnings, the Bundle Resource shall also contain an OperationOutcome Resource that contains those warnings.

The response shall adhere to the FHIR Bundle constraints specified in ITI TF-2x: Appendix Z.1.

3.44.4.2.2.1 Document Provenance Option

A Clinical Data Source that supports the Document Provenance Option is part of a document sharing environment. This enables it to access the data elements for FHIR Resources returned in the [PCC-44] query response and also reference(s) to original document(s).

The Clinical Data Source shall make available one Provenance Resource for every document from which it extracted data elements.

The Clinical Data Source may return Provenance Resources used for other purposes than the one defined here. These would not have the indicated `Provenance.policy` for this transaction.

The following bullets list the constraints for the FHIR Provenance Resource:

- `Provenance.target` shall be a reference to each of the FHIR Resources extracted from the document referenced by the `Provenance.entity` element.
- `Provenance.policy` shall contain the static URI “`urn:ihe:pcc:qedm:2017:document-provenance-policy`”.
- `Provenance.agent` shall contain at least one entry [1..*] holding the description of the system that extracted the elements from the document.
  - `Provenance.agent.type` shall contain “assembler” code in the system “`http://terminology.hl7.org/CodeSystem/provenance-participant-type`”.

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- `Provenance.agent.who` shall be a Device Resource identifying the extraction device. This should be by reference to a known Device Resource but may be a contained resource or an identifier.

- `Provenance.entity` shall contain one element [1..1] describing the document from which the elements were extracted.
  - `Provenance.entity.role` shall be the code "`source`"
  - `Provenance.entity.what` shall be populated with one or more of the following:
    - `Provenance.entity.what.reference` shall be the reference to the `DocumentReference Resource` as specified in the MHD Profile.
    - `Provenance.entity.what.identifier` shall be the reference metadata attributes used to access documents in the XDS Profile:
      - The value of `DocumentEntry.repositoryUniqueId` as `.system`
      - The value of `DocumentEntry.uniqueId` as `.value`

A FHIR StructureDefinition can be found in implementation materials; see ITI TF-2x: Appendix W for instructions on how to get to the implementation materials.

3.44.4.2.2.2 Resource Bundling

Resource Bundling shall comply with the guidelines in ITI TF-2x: Appendix Z.1.

The Clinical Data Source shall include all resources to be returned as a contained resource. This means that the query shall return resource data contained in the FHIR Bundle as entries.

3.44.4.2.3 Expected Actions

The Clinical Data Consumer processes the bundle of resources, received in transaction [PCC-44] according to the capabilities of its application. These capabilities are not specified by IHE.

If a Clinical Data Consumer cannot automatically recover from an error condition, it should offer a means to make the error accessible to the query initiator (e.g., user, system).

3.44.4.2.3.1 Document Provenance Option

A Clinical Data Consumer that supports the Document Provenance Option processes the document references contained in the FHIR Provenance resources. The document references enable the Clinical Data Consumer to access the documents from which the data elements were extracted.

When a Provenance resource is received with Provenance.policy valued at "`urn:ihe:pcc:qedm:2017:document-provenance-policy`" and Provenance.target has a

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reference for the data element(s) for which a document reference is sought, the Clinical Data Consumer:

- Shall extract from these Provenance.entity, the reference contained in the Provenance.entity to the document from which the target data-element was extracted.

A Clinical Data Consumer that supports the Document Provenance Option shall process all Provenance resources contained in a bundle returned by a [PCC-44] transaction where each provenance resource may include one or more Provenance.target in conjunction with one or more Provenance.entity.

3.44.4.3 Conformance Resource

Clinical Data Sources implementing this transaction shall provide a Conformance Resource as described in ITI TF-2x: Appendix Z.3 indicating the query operation for the Resources have been implemented and shall include all the supported query parameters.

3.44.5 Security Considerations

The retrieved content contains PHI that shall be protected.

See the general Security Considerations in PCC TF-1: X.5.

3.44.5.1 Security Audit Considerations

Grouping a Clinical Data Source with an ATNA Secure Node or Secure Application is required. Grouping a Clinical Data Consumer with an ATNA Secure Node or Secure Application is recommended.

The Clinical Data Consumer may be considered overburdened to fully implement the requirements of a Secure Node or Secure Application. The Clinical Data Source is likely a more robust application and shall generate audit messages.

Both actors generate a “Query” Audit Message, which is consistent with ATNA. The Mobile Query Existing Data [PCC-44] is a Query Information event as defined in ITI TF-2: Table 3.20.4.1.1.1-1. The message shall comply with the following pattern:

- Event
  - EventID = EV(110112, DCM, “Query”)
  - EventTypeCode = EV(“PCC-44”, “IHE Transactions”, “Mobile Query Existing Data”)
  - EventActionCode = “E” (Execute)
- Source of the request (1..1)
  - UserID = The Clinical Data Consumer Actor system identity
  - RoleIDCode = EV(110153, DCM, “Source”)

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- Human Requestor (0..n) → one for each know User
  - UserID = Identity of the human that initiated the transaction.
  - RoleIDCode = Access Control role(s) the user holds that allows this transaction
- Destination of the request (1..1)
  - Clinical Data Source Actor system identity
  - RoleIDCode = EV(110152, DCM, “Destination”)
- Audit Source (1..1)
  - not specified
- Patient (1..1)
  - ParticipantObjectTypeCode = “1” (Person)
  - ParticipantObjectTypeCodeRole = “1” (Patient)
  - ParticipantObjectID = The ‘patient’ parameter value
- Query Parameters (1..1)
  - ParticipantObjectTypeCode = “2” (system object)
  - ParticipantObjectTypeCode Role = “24” (query)
  - ParticipantObjectIDTypeCode = EV(“PCC-44”, “IHE Transactions”, “Mobile Query Existing Data”)
  - ParticipantObjectQuery = Requested URL including query parameters, base64 encoded
  - ParticipantObjectDetail = HTTP Request Headers contained in the query (e.g., Accept header)

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Volume 3 – Content Modules

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Not applicable.

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Volume 4 – National Extensions

4 National Extensions

940 ## 4.1 National Extensions for IHE United States

4.1.1 Comment Submission

This national extension document was authored under the sponsorship and supervision of IHE PCC with collaboration from the CDC/National Center for Health Statistics who welcome comments on this document and the IHE USA initiative. Comments should be directed to
945 http://ihe.net/PCC_Public_Comments.

4.1.2 Query for Existing Data for Mobile (QEDm)

4.1.2.1 QEDm US Volume 1 Constraints

No additional constraints to Volume 1.

4.1.2.2 QEDm US Volume 2 Constraints

950 The following US Realm FHIR Profiles specified at the Reference link location SHALL be used to fulfill the specified profiles in the US implementation:

Table 3.44.4.1.2.1-1: QEDm Options, FHIR Resources and Query Search Parameters

QEDm Actor Option	FHIR Resource Type	Reference	Search Parameters
Occupational Data for Health	**Observation (See Note 1)**	CombatZonePeriod	See Section 3.44.4.1.2.1.10
		EmploymentStatus	
		PastOrPresentJob	
		RetirementDate	
		UsualWork	

Note 1: Definitions and vocabularies for these resources are available at the referenced link

955 #### 4.1.2.3 QEDm US Volume 3 Constraints

No additional constraints to Volume 3

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