

Integrating the Healthcare Enterprise



5 **IHE IT Infrastructure**
Technical Framework Supplement

10 **Patient Master Identity Registry**
(PMIR)

HL7[®] FHIR[®] R4

Using Resources at FMM Level 3-N

15 **Revision 1.1 – 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.

Foreword

30 This is a supplement to the IHE IT Infrastructure Technical Framework V16.0. 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 December 5, 2019 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 IT
35 Infrastructure Technical Framework. Comments are invited and may be submitted at http://www.ihe.net/ITI_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.

40 *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.

45

General information about IHE can be found at <http://ihe.net>.

Information about the IHE IT Infrastructure domain can be found at http://ihe.net/IHE_Domains.

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at http://ihe.net/IHE_Process and <http://ihe.net/Profiles>.

50 The current version of the IHE IT Infrastructure Technical Framework can be found at http://ihe.net/Technical_Frameworks.

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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 PMIR Profile is based on Release 4 of the emerging HL7^{®1} FHIR^{®2} standard. 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
Patient	N
Bundle	N
MessageHeader	4
Subscription	3

140 The Patient Master Identity Registry (PMIR) Profile supports the creating, updating and
deprecating of patient master identity information about a subject of care, as well as subscribing
to changes to the patient master identity, using the HL7 FHIR standard resources and RESTful
transactions. In PMIR, “patient identity” information includes all information found in the FHIR
Patient Resource such as identifier, name, phone, gender, birth date, address, marital status,
photo, others to contact, preference for language, general practitioner, and links to other
145 instances of identities. The “patient master identity” is the dominant patient identity managed
centrally among many participating organizations (a.k.a., “Golden Patient Identity”).

¹ HL7 is the registered trademark of Health Level Seven International.

² FHIR is the registered trademark of Health Level Seven International.

Beyond the basic create, retrieve, update, and delete transaction set, this profile addresses important patient safety issues related to cases where there are two or more patient master identities that have been established for the same person, thus it is not clear which identity is the “true” one. There is also a risk that health data (possibly conflicting) may be associated with each identity – and these disparate data, together, may need to be reconciled before a fully and accurate “health picture” can be developed for this person. These situations represent patient safety risks. This profile addresses how these multiple patient master identities can be merged into a single patient master identity, and how this merge flows down to data custodians so that they take appropriate actions. It is outside the scope of this profile to define how references to the deprecated patient master identity from other data should be handled.

This profile is intended for FHIR-only configurations without other underlying standards for patient master identity management. The FHIR message pattern was chosen because it fits well into the subscription notification model.

Open Issues and Questions

PMIR-1: HL7 Patient Administration workgroup is looking at better defining the patient merge/link functionality in FHIR. We will follow this work and collaborate with HL7 to keep these efforts aligned. See <https://confluence.hl7.org/display/PA/Merge+Operation>

165 **PMIR-2:** Should we include shall, should, or may for Provenance resources in the Mobile Patient Identity Feed transaction? This version doesn't provide any guidance on Provenance, should it?

PMIR-6: Should we include an option on the Patient Identity Manager to support the FHIR \$match operation on patients? This would require an additional actor and transaction.

170 **PMIR-7:** IHE has submitted a Change Request [GF#23009](#) with HL7 to clarify their usage of link with RelatedPerson as recommended in this profile to allow for management of parent relationships to children.

PMIR-8: Should we require maintaining resource versioning information when updates are made to resources?

175 **PMIR-9:** If other domain patient identities are included in the feed, should there be expected actions on the Patient Identity Manager or Patient Identity Consumer?

PMIR-10: The security for the feed transaction is currently being debated in IHE and HL7. The mutual authentication solution in ATNA may be used. The IUA solution with OAuth identities may be used. These solutions aren't straight-forward and resolution of IHE's recommendation requires trial implementation feedback.

180

Closed Issues

PMIR-3: Should Subscription be an option or required on the Patient Identity Manager? Should the configurable feed destination be an option or required for Patient Identity Manager?

185 *Subscription is required and there is no requirement for how a configurable feed destination is handled.*

PMIR-4: *There is a new profile work item in ITI that would bind this profile and MHD into a FHIR based document sharing health information exchange. That profile is Mobile Health Document Sharing (MHDS).*

190 **PMIR-5:** In some profiles demographics is used to cover all demographic information including identifiers. This profile uses identity to cover demographics and identifiers. Which term is most clear and should this profile use demographics instead of identity?

We have used identity to cover both identifiers and demographics as defined under the new glossary terms and in the Concepts section.

195

General Introduction and Shared Appendices

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

200

*Update the following appendices to the General Introduction as indicated below. Note that these are **not** appendices to Volume 1.*

Appendix A – Actor Summary Definitions

205

Add the following actors to the IHE Technical Frameworks General Introduction Appendix A:

Actor Name	Definition
Patient Identity Manager	A Patient Identity Manager receives patient identity updates, manages patient master identities, patient identities, sends patient identity updates for patient identity changes, and provides a searchable repository of patient identity information.
Patient Identity Subscriber	A Patient Identity Subscriber sends subscription requests for patient identity updates to be sent to a Patient Identity Consumer.
Patient Identity Consumer	A Patient Identity Consumer receives patient identity updates.

Appendix B – Transaction Summary Definitions

210

Add the following transactions to the IHE Technical Frameworks General Introduction Appendix B:

Transaction Name and Number	Definition
Mobile Patient Identity Feed [ITI-93]	Notifications of all events related to patient identities (creation, update, link, etc.).
Subscribe to Patient Updates [ITI-94]	Subscription to notifications about events impacting patient identities (creation, update, link, etc.).

Appendix D – Glossary

215

*Add the following **new** glossary terms to the IHE Technical Frameworks General Introduction Appendix D.*

Glossary Term	Definition
Patient Identity	All information used for identifying the patient, such as identifier, name, phone, gender, birth date, address, marital status, photo, others to contact, preference for language, general practitioner, and links to other patient identities.
Patient Master Identity	The patient identity that is considered dominant for a patient within a domain. An authority manages the patient master identity among many participants in the domain. The patient master identity is harmonized using business rules appropriate to the setting. (a.k.a., golden patient)
Merge Patient Identity	Merging of patient identities is where two patient identities, in the same patient identity domain, are found to refer to the same patient identity and one becomes the surviving patient identity.

Volume 1 – Profiles

220

<i>Add new Section 49</i>

49 Patient Master Identity Registry (PMIR) Profile

225 The Patient Master Identity Registry (PMIR) Profile supports the creating, updating and
deprecating of patient master identity information about a subject of care, as well as subscribing
to changes to the patient master identity, using the HL7 FHIR standard resources and RESTful
transactions. In PMIR, “patient identity” information includes all information found in the FHIR
230 Patient Resource such as identifier, name, phone, gender, birth date, address, marital status,
photo, others to contact, preference for language, general practitioner, and links to other
instances of identities. The “patient master identity” is a dominant identity managed centrally
among many participating organizations (a.k.a., “Golden Patient Identity”).

Beyond the basic create, retrieve, update, and delete transaction set, this profile addresses
important patient safety issues related to cases where there are two or more patient master
235 identities that have been established for the same person, thus it is not clear which identity is the
“true” one. There is a patient safety risk that health data (possibly conflicting) may be associated
with each identity – and these disparate data, together, may need to be reconciled before a fully
and accurate “health picture” can be developed for this person. This profile addresses how these
multiple patient master identities can be merged into a single patient master identity, and how
240 this merge flows down to data custodians so that they take appropriate actions. It is outside the
scope of this profile to define how references to the deprecated patient master identity from other
data should be handled.

49.1 PMIR Actors, Transactions, and Content Modules

245 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.
IHE Transactions can be found in the Technical Frameworks General Introduction Appendix B.
Both appendices are located at http://ihe.net/Technical_Frameworks/#GenIntro

Figure 49.1-1 shows the actors directly involved in the PMIR Profile and the relevant
transactions between them.

250

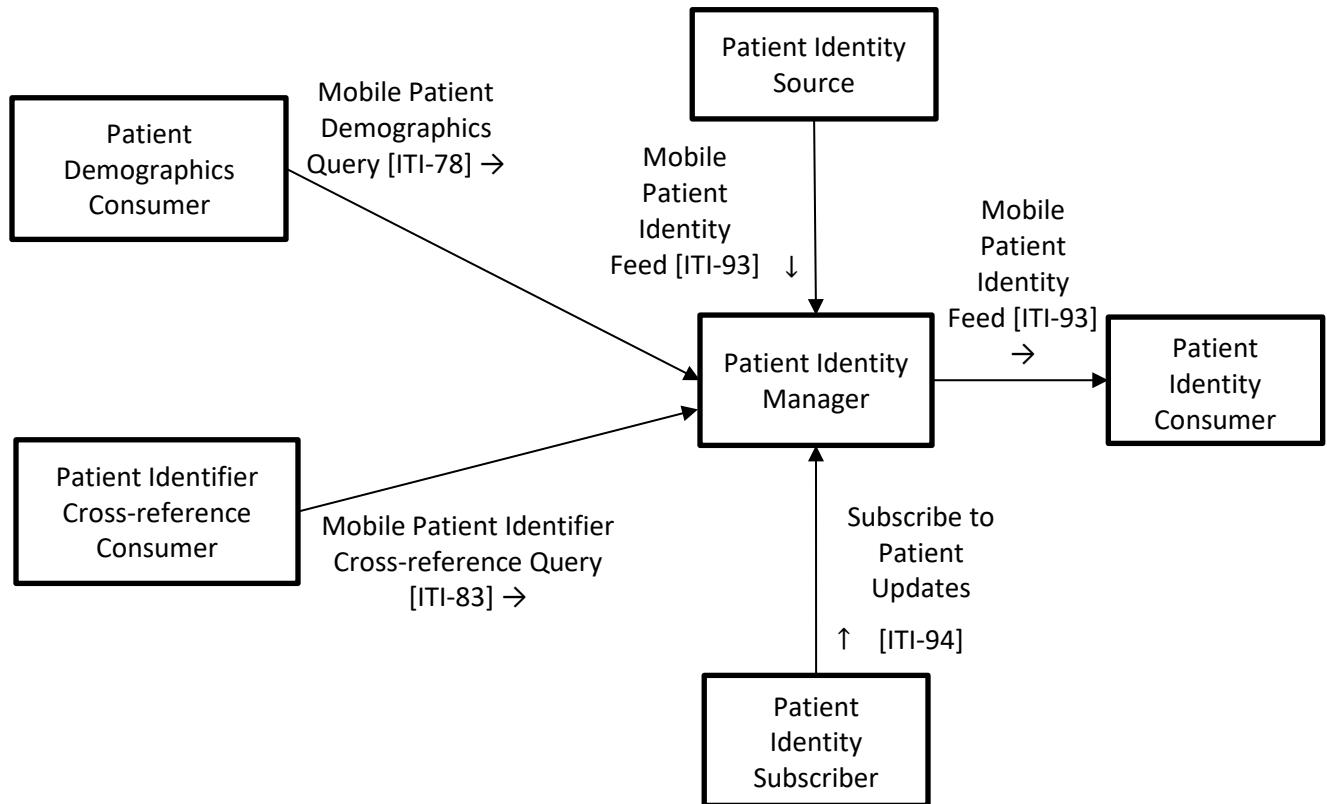
**Figure 49.1-1: PMIR Actor Diagram**

Table 49.1-1 lists the transactions for each actor directly involved in the PMIR 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 49.1-1: PMIR Profile - Actors and Transactions

Actors	Transactions	Initiator or Responder	Optionality	Reference
Patient Identity Source	Mobile Patient Identity Feed [ITI-93]	Initiator	R	ITI TF-2c: 3.93
Patient Identity Consumer	Mobile Patient Identity Feed [ITI-93]	Responder	R	ITI TF-2c: 3.93
Patient Identity Manager	Mobile Patient Identity Feed [ITI-93]	Initiator and Responder	R	ITI TF-2c: 3.93
	Mobile Patient Identifier Cross-reference Query [ITI-83]	Responder	R	ITI TF-2c: 3.83 (Note 1)
	Mobile Patient Demographics Query [ITI-78]	Responder	R	ITI TF-2c: 3.78 (Note 2)
	Subscribe to Patient Updates [ITI-94]	Responder	R	ITI TF-2c: 3.94

Actors	Transactions	Initiator or Responder	Optionality	Reference
Patient Demographics Consumer	Mobile Patient Demographics Query [ITI-78]	Initiator	R	ITI TF-2c: 3.83
Patient Identifier Cross-reference Consumer	Mobile Patient Identifier Cross-reference Query [ITI-83]	Initiator	R	ITI TF-2c: 3.83
Patient Identity Subscriber	Subscribe to Patient Updates [ITI-94]	Initiator	R	ITI TF-2c: 3.94

Note 1: The Patient Identity Manager shall respond to [ITI-83] queries using the requirements in that transaction for the Patient Identity Cross-Reference Manager.

260

Note 2: The Patient Identity Manager shall respond to [ITI-78] queries using the requirements in that transaction for the Patient Demographics Supplier.

49.2 PMIR Actor Options

Options that may be selected for each actor in this profile, if any, are listed in the Table 49.2-1.

265

Dependencies between options, when applicable, are specified in notes.

Table 49.2-1: PMIR – Actors and Options

Actor	Option Name	Reference
Patient Identity Source	None	--
Patient Identity Consumer	None	--
Patient Identity Manager	None	--
Patient Demographics Consumer	None	--
Patient Identifier Cross-reference Consumer	None	--
Patient Identity Subscriber	None	--

49.3 PMIR Required Actor Groupings

Table 49.3-1: PMIR Profile - Required Actor Groupings

PMIR Actor	Actor(s) to be grouped with	Reference	Content Bindings Reference
Patient Identity Source	--	None	--
Patient Identity Consumer	--	None	--
Patient Identity Manager	--	None	--
Patient Demographics Consumer	--	None	--
Patient Identifier Cross-reference Consumer	--	None	--
Patient Identity Subscriber	--	None	--

270 **49.4 PMIR Overview**

49.4.1 Concepts

Patient Identity is comprised of all information identifying the patient, such as identifier, name, phone, gender, birth date, address, marital status, photo, others to contact, preference for language, general practitioner, and links to other patient identities.

275 Patient Master Identity is the patient identity that is considered dominant for a patient within a domain. An authority manages the patient master identity among many participants in the domain. The patient master identity is harmonized using business rules appropriate to the setting. (a.k.a., Golden Patient)

280 The Patient Identity Manager manages this domain that is represented by the base URL of this actor.

If multiple patient identities in the same patient identity domain are found to refer the same patient, these patient identities may be merged into a single surviving patient identity.

49.4.2 Use Cases

49.4.2.1 Use Case #1: Lookup Patient Identity

285 A client needs to lookup a patient master identity.

49.4.2.1.1 Lookup Patient Identity Use Case Description

When a patient master identity is needed, a client uses a PIXm or PDQm query; then a patient master identity will be returned.

49.4.2.2 Use Case #2: Create Patient Identity

290 A new client record is created in a demographic database.

49.4.2.2.1 Create Patient Identity Use Case Description

295 Following a healthy pregnancy, Mosa gives birth to her new baby Joshua. Information is captured about Joshua and about the relationship between him and his parents in the care facility's electronic medical records (EMR) system. Leveraging the information in the EMR, a new patient master identity record is created for baby Joshua in the Ministry of Health's (MOH) national client registry (CR).

300 Joshua's patient master identity in the client registry establishes his unique identity across the care delivery network operated under the auspices of the MOH. Joshua's data are also securely shared with the Civil Registration and Vital Statistics (CRVS) database maintained by the Ministry of Home Affairs in the country where Joshua was born. These data are used to generate a birth certificate for Joshua.

Some days after Mosa and Joshua return home from the care facility, Joshua's health card and his birth certificate are delivered. Joshua now has his unique master identifier for health purposes and his birth certificate, which affords him a legal status in his country.

305 In Figure 49.4.2.2.2-1 below: The EMR acts as a Patient Identity Source. The CR acts as the Patient Identity Manager. The CRVS acts as a Patient Identity Consumer.

49.4.2.2.2 Create Patient Identity Process Flow

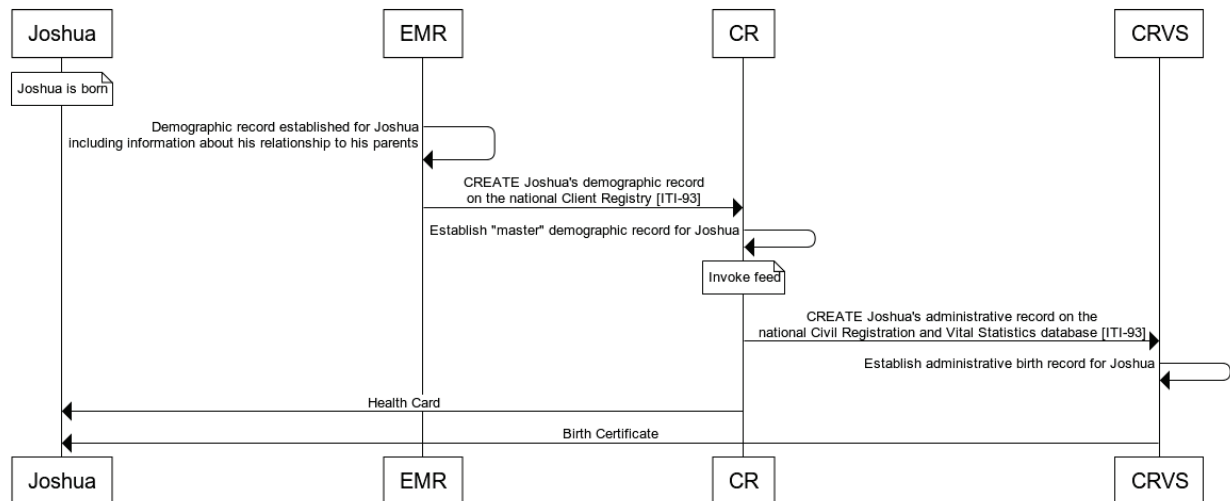


Figure 49.4.2.2.2-1: Process Flow for the Create Patient Identity Use Case

```

310 @startuml
315 participant Joshua
315 participant EMR
315 participant CR
315 participant CRVS
315 Note over Joshua: Joshua is born
315 EMR->EMR: Demographic record established for Joshua\nincluding information about his relationship
315 to his parents
315 EMR->CR: CREATE Joshua's demographic record\non the national Client Registry [ITI-93]
315 CR->CR: Establish "master" demographic record for Joshua
315 Note over CR: Invoke feed
315 CR->CRVS: CREATE Joshua's administrative record on the\nnational Civil Registration and Vital
315 Statistics database [ITI-93]
315 CRVS->CRVS: Establish administrative birth record for Joshua
315 CR->Joshua: Health Card
315 CRVS->Joshua: Birth Certificate
315 @enduml
  
```

Figure 49.4.2.2.2-2: Create Patient Identity Workflow Diagram Pseudocode

330 **Pre-conditions:**

Joshua is born at a care facility. The details about his name, his gender, and his parental relationships are known. These are captured in the care facility's EMR. Since this is a birth and the first time the record is entered in the EMR no queries are made to search for existing records.

Main Flow:

- 335 Joshua's information in the care facility's EMR is communicated to the MOH's national Client Registry (CR). If the information is valid, the patient identity will be created on the CR. Joshua's information in the CR is also communicated to the MOH's national Civil Registration and Vital Statistics (CRVS) database.

Post-conditions:

- 340 If the Create message was valid, his new patient master identity will be established on the MOH's CR and on the MOH's CRVS. In time, Joshua will receive his health card and his birth certificate.

49.4.2.3 Use Case #3: Update Patient Identity

An existing client identity is updated in an identity database.

345 **49.4.2.3.1 Update Patient Identity Use Case Description**

Following a healthy childhood and after completing his schooling, Joshua leaves home to start a new job in a nearby city. As part of starting his new job at his new company, Joshua attends at a local community clinic in the new city to obtain a physical check-up as part of the process to become enrolled in the company's health insurance plan.

- 350 Joshua's identity details are created in the clinic's EMR with his new address and his new mobile phone number. The EMR searches the CR for Joshua's master patient identity and then updates the MOH CR with Joshua's updated identity details.

In Figure 49.4.2.3.2-1 below: The EMR acts as a Patient Identity Supplier. The CR acts as the Patient Identity Manager.

49.4.2.3.2 Update Patient Identity Process Flow

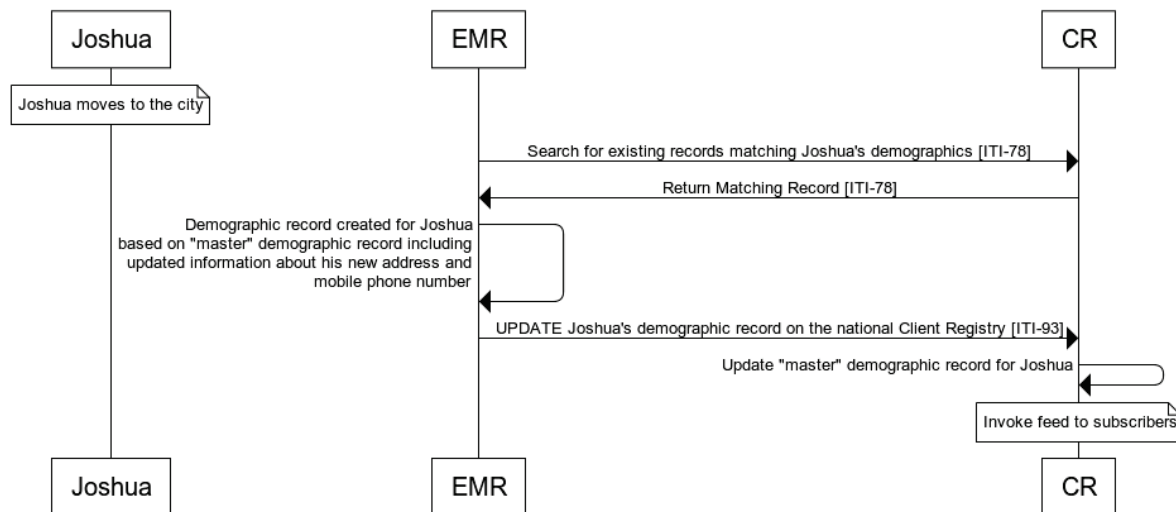


Figure 49.4.2.3.2-1: Process Flow for the Update Patient Identity Use Case

```

@startuml
participant Joshua
participant EMR
participant CR
Note over Joshua: Joshua moves to the city
EMR->>CR: Search for existing records matching Joshua's demographics [ITI-78]
CR-->>EMR: Return Matching Record [ITI-78]
EMR->>EMR: Demographic record created for Joshua\nbased on "master" demographic record\nincluding\nupdated information about his new address and\nmobile phone number
EMR->>CR: UPDATE Joshua's demographic record on the national Client Registry [ITI-93]
CR->>CR: Update "master" demographic record for Joshua
Note over CR: Invoke feed to subscribers
enduml
  
```

Figure 49.4.2.3.2-2: Update Patient Identity Workflow Diagram Pseudocode

Pre-conditions:

Joshua has moved to the city and has a new address and mobile phone number. Joshua's master patient identity is retrieved from the CR into the EMR and these updated details are captured in the community care facility's EMR.

Main Flow:

Joshua's information in the care facility's EMR is communicated as an UPDATE to the MOH's national Client Registry (CR).

Post-conditions:

If the EMR message was valid, his existing patient master identity will be updated on the MOH's CR with the new, more up-to-date information that was captured in the community clinic's EMR.

49.4.2.4 Use Case #4: Merge Patient Identities

385 A *duplicate* patient master identity is detected, in an identity database. This duplicate patient master identity is merged with the pre-existing *correct* patient master identity and health data that has been captured against the duplicate patient master identity is corrected to the *surviving* patient master identity.

49.4.2.4.1 Merge Patient Identities Use Case Description

390 Joshua becomes concerned and travels to a different city to visit a Voluntary Counseling and Testing (VCT) clinic to be tested for HIV. He pretends that he has forgotten his health card and provides inaccurate demographic information at the VCT, who set up a new record for him in their EMR. The EMR communicates this demographic information to the MOH's CR where a new demographic record for Joshua is established.

395 Joshua completes the HIV rapid test, which is positive. A confirmatory test is taken, which must be sent to the regional lab for processing. Both the results of the rapid test and the results of the confirmatory test reference Joshua's *duplicate* patient master identity. The test results are saved to the Shared Health Record (SHR) referencing the duplicate patient master identity.

400 When Joshua returns to the clinic to receive his confirmatory lab results, and after receiving counselling regarding confidentiality rules and the importance of care continuity, Joshua corrects his patient master identity. The EMR merges Joshua's two patient master identities to a single patient master identity and sends a merge message to the national CR to do the same. Note: An unmerge would be handled as an administrative function and is out of scope for this profile.

405 The various databases that store health information about Joshua have subscribed to patient update transactions on the national CR. To ensure patient safety for Joshua, these systems ensure that a query using Joshua's resolved patient master identity would, correctly, return all of the health information associated with him -- whether it was originally persisted under his correct (surviving) patient master identity or under the duplicate (subsumed) patient master identity.

In Figure 49.4.2.4.2-1 below, the EMR acts as a Patient Identity Source. The LAB and SHR act as Patient Identity Consumers. The CR acts as the Patient Identity Manager.

49.4.2.4.2 Merge Patient Identities Process Flow

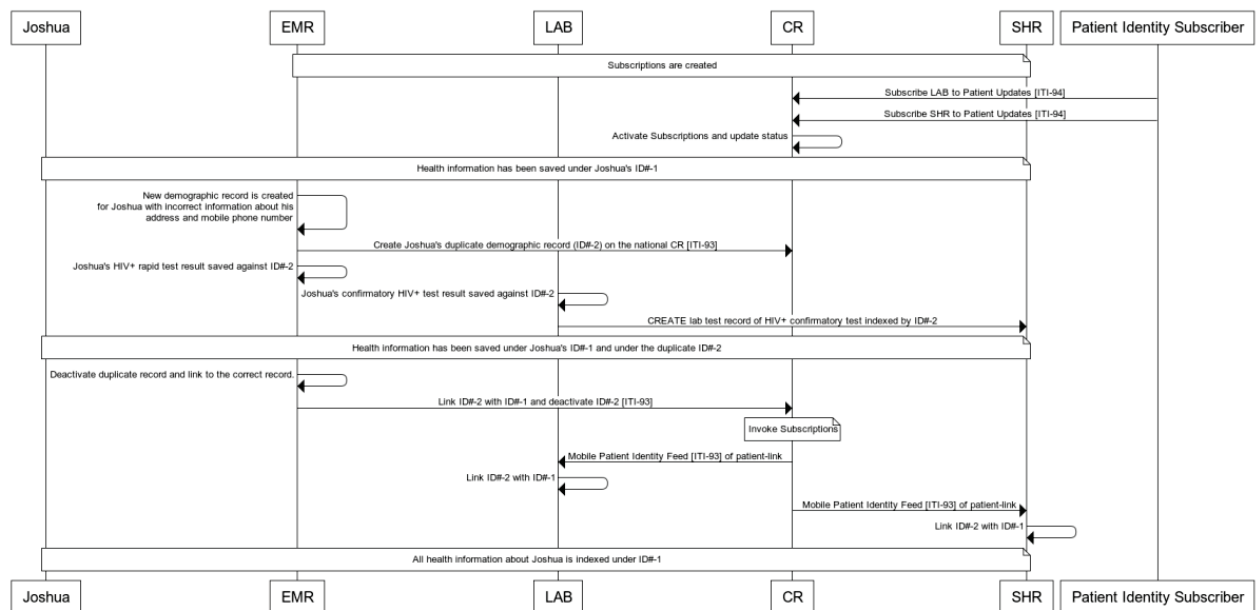


Figure 49.4.2.4.2-1: Process Flow for the Merge Patient Identities Use Case

```

@startuml
participant Joshua
participant EMR
participant LAB
participant CR
participant SHR
participant Patient Identity Subscriber

Note over EMR,LAB,CR,SHR: Subscriptions are created
Patient Identity Subscriber->CR: Subscribe LAB to Patient Updates [ITI-94]
Patient Identity Subscriber->CR: Subscribe SHR to Patient Updates [ITI-94]
CR->CR: Activate Subscriptions and update status

Note over Joshua,EMR,LAB,CR,SHR: Health information has been saved under Joshua's ID#-1
EMR->EMR: New demographic record is created\nfor Joshua with incorrect information about\nhis\naddress and mobile phone number
EMR->CR: Create Joshua's duplicate demographic record (ID#-2) on the national CR [ITI-93]
EMR->EMR: Joshua's HIV+ rapid test result saved against ID#-2
LAB->LAB: Joshua's confirmatory HIV+ test result saved against ID#-2
LAB->SHR: CREATE lab test record of HIV+ confirmatory test indexed by ID#-2

Note over Joshua,EMR,LAB,CR,SHR: Health information has been saved under Joshua's ID#-1 and under\nthe duplicate ID#-2
EMR->EMR: Deactivate duplicate record and link to the correct record.
EMR->CR: Link ID#-2 with ID#-1 and deactivate ID#-2 [ITI-93]
Note over CR: Invoke Subscriptions
CR->LAB: Mobile Patient Identity Feed [ITI-93] of patient-link
LAB->LAB: Link ID#-2 with ID#-1
CR->SHR: Mobile Patient Identity Feed [ITI-93] of patient-link
SHR->SHR: Link ID#-2 with ID#-1

Note over Joshua,EMR,LAB,CR,SHR: All health information about Joshua is indexed under ID#-1
enduml

```

Figure 49.4.2.4.2-2: Merge Patient Identities Workflow Diagram Pseudocode

Pre-conditions:

Systems that maintain patient information subscribe to the Patient Identity Feed on the national Client Registry.

Main Flow:

450 A duplicate patient master identity is detected and when the error is found, the duplicate
identities are merged on the EMR, and a transaction is executed to merge them on the CR. This
triggers sending notifications to the health data systems that have subscribed to updates on the
CR, which include updated information about the patient identities that were merged. Each of
455 these health data systems updates their local health data to reflect the merged patient master
identity.

Post-conditions:

Following the execution of the triggered merge message, each system that maintains health data about the subject of care has updated this local data to reflect the merge of the two patient identities. The subsumed patient identity is deprecated.

460 **49.5 PMIR Security Considerations**

The PMIR Profile is communicating patient identity information including identifiers, addresses, demographics, and contact information. This information includes personal identifiers, and the identity is linked to health information. Care must be taken to protect the privacy of the patient and the security of system.

465 See ITI TF-2x: Appendix Z.8 for general FHIR security considerations.

49.6 PMIR Cross Profile Considerations

None.

470

Appendices

Not applicable.

Volume 2c – Transactions (cont.)

475 *Add Section 3.93*

3.93 Mobile Patient Identity Feed [ITI-93]

3.93.1 Scope

The Mobile Patient Identity Feed transaction sends a FHIR Bundle of new and updated Patient Resources.

480 **3.93.2 Actor Roles**

The roles in this transaction are defined in the following table and may be played by the actors shown here:

Table 3.93.2-1: Actor Roles

Role:	Supplier: Sends a bundle of updates.
Actor(s):	The following actors may play the role of <i>Supplier</i> : Patient Identity Source Patient Identity Manager
Role:	Consumer: Accepts the bundle request and returns a bundle response.
Actor(s):	The following actors may play the role of <i>Consumer</i> : Patient Identity Manager Patient Identity Consumer

3.93.3 Referenced Standards

- 485
- HL7 FHIR standard Release 4 <http://hl7.org/fhir/R4/index.html>

3.93.4 Messages

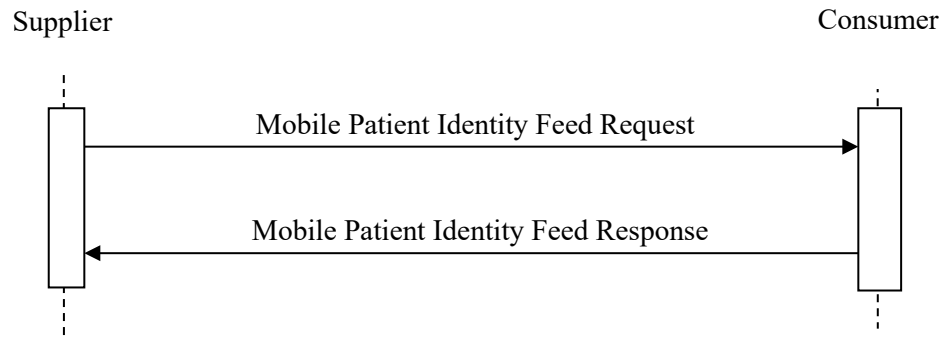


Figure 3.93.4-1: Interaction Diagram

3.93.4.1 Mobile Patient Identity Feed Request Message

490 The Mobile Patient Identity Feed message is a FHIR message with the new and updated Patient Resource(s).

3.93.4.1.1 Trigger Events

A Supplier triggers a Mobile Patient Identity Feed Request to a Consumer when patients are created, updated, merged, or deleted.

495 The Consumer is identified either by a subscription in the Subscribe to Patient Updates [ITI-94] transaction or by a configuration.

3.93.4.1.2 Message Semantics

A Supplier initiates a FHIR message request using HTTP POST as defined at <https://www.hl7.org/fhir/R4/messaging.html> on a Bundle Resource.

500 A Supplier shall create a Bundle Resource of type “message” with the first entry being a MessageHeader Resource. The MessageHeader Resource shall be further constrained as described in Table 3.93.4.1.2.2-1. The remaining entries will be the Patient Resource(s).

505 A Supplier shall be able to send a request for both the JSON and the XML messaging formats as defined in FHIR. A Consumer shall support accepting either the JSON or the XML messaging formats as defined in FHIR depending on the Subscription or configuration of the Consumer. See ITI TF-2x: Appendix Z.6 for more details.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

3.93.4.1.2.1 FHIR Bundle Resource Constraints

510 The Bundle Resource shall be further constrained as described in Table 3.93.4.1.2.1-1. The Element column in Table 3.93.4.1.2.1-1 references the object model defined at <https://www.hl7.org/fhir/R4/bundle.html#resource>.

Table 3.93.4.1.2.1-1: Bundle Resource Constraints

Element & Cardinality	Constraints
type [1..1]	Shall be: message
entry [2..*]	The first resource in the entry list shall be a MessageHeader Resource. The remaining entries shall be unique Patient Resource(s). In other words, the same Patient Resource shall not appear twice in this message.
entry.request.method	Each entry of Patient Resource shall include the request method that shall be used to handle this resource to indicate created, updated, or deleted records: POST PUT DELETE

3.93.4.1.2.2 FHIR MessageHeader Resource Constraints

515 A Supplier shall create a Bundle Resource of type “message” with the first entry being a MessageHeader Resource. The MessageHeader Resource shall be further constrained as described in Table 3.93.4.1.2.2-1. The Element column in Table 3.93.4.1.2.2-1 references the object model defined at <https://www.hl7.org/fhir/R4/messageheader.html#resource>.

Table 3.93.4.1.2.2-1: MessageHeader Resource Constraints

Element & Cardinality	Constraints
eventUri [1..1]	Shall be: urn:ihe:iti:pmir:2019:patient-feed
focus [1..*]	Reference (Patient) The patients being sent in this feed.

Element & Cardinality	Constraints
destination [1..*]	The destination(s) of this feed.
sender [0..1]	Required if known.
enterer [0..1]	Required if known.
author [0..1]	Required if known.
responsible [0..1]	Required if known.

520

3.93.4.1.2.3 FHIR Bundle entry Constraints for Merge

When a merge is needed, the Patient Resource to be deprecated shall be included and shall be constrained as described in Table 3.93.4.1.2.3-1. The Element column in Table 3.93.4.1.2.3-1 references the object model defined at <https://www.hl7.org/fhir/R4/patient.html#resource>.

525

Table 3.93.4.1.2.3-1: Bundle entry Constraints for Merge

Element & Cardinality	Constraints
entry.resource.active	Shall be: "false"
entry.resource.link.type	Shall be: "replaced-by"
entry.resource.link.other	Shall be a reference to the surviving Patient Resource.
entry.request.method	PUT

3.93.4.1.2.4 FHIR Patient Resource Constraints for Related Person

When a Patient needs to be associated to a related person (such as parents), the Patient Resource of the patient master identity shall be constrained as described in Table 3.93.4.1.2.4-1. The Element column in Table 3.93.4.1.2.4-1 references the object model defined at <https://www.hl7.org/fhir/R4/patient.html#resource>.

530

Table 3.93.4.1.2.4-1: Patient Resource Constraints

Element & Cardinality	Constraints
link.type	Shall be: "seealso"
link.other	Shall by a reference to a RelatedPerson Resource.

3.93.4.1.2.5 Example FHIR Bundle Excerpt for a Merge

535 Figure 3.93.4.1.2.5-1 shows a Bundle excerpt to show Patient 123 being replaced by Patient 456
 with no patient identity changes made to the surviving patient identity.

```

540 {
    "resourceType": "Bundle",
    "type": "message",
    "entry": [
      {
        "resourceType": "MessageHeader",
        "eventUri": "urn:ihe:iti:pmir:2019:patient-feed",
        "focus": [
          {
            "reference": "Patient/123"
          }
        ],
        "destination": [
          {
            "endpoint": "http://example.com/patientEndpoint"
          }
        ]
      },
      {
        "resource": {
          "resourceType": "Patient",
          "id": "123",
          "active": false,
          ...
          "link": [
            {
              "other": {
                "reference": "Patient/456"
              },
              "type": "replaced-by"
            }
          ]
        },
        "request": {
          "method": "PUT",
          "url": "Patient/123"
        }
      }
    ]
  }
  
```

Figure 3.93.4.1.2.5-1: Example FHIR Bundle Excerpt for a Merge

3.93.4.1.3 Expected Actions

580 A Consumer shall accept the message and return a Mobile Patient Identity Feed Response message (Section 3.93.4.2) and will process the feed according to its application capabilities.

A Consumer receives a merge (Section 93.4.1.2.4), it shall deprecate the replaced Patient Resource. In addition, other profiles that use this transaction might provide additional requirements such as updating the data it is managing.

A Consumer who is a Patient Identity Manager shall:

- 585 • Create: create Patient Resources when a create is sent.
- Update: persist updates to Patient Resources.
- Delete: See Section 3.93.4.1.3.1.
- Merge: deprecate the Patient Resource when the message includes a replaced-by
590 link.type. The Patient Identity Manager shall set the deprecated Patient active to
 “false” and include a link with type set to “replaced-by” and other set to the
 surviving Patient. See Section 3.93.4.1.3.1.
- Unmerge: not supported by this transactions, so return a correlated
 entry.response.code of 405 when a link.type of “replaced-by” is removed from a
 Patient Resource. (i.e., an attempt to unmerge)

595 3.93.4.1.3.1 Post Merge/Delete Expectations

Based upon policy, a Patient Identity Manager:

When performing a GET on the deprecated or deleted Patient resource ID (e.g., GET [base]/Patient/pat01) return:

- 200 OK and returns the deprecated Patient which is now marked as inactive
- 600 • 404 not found

When performing a SEARCH by the deprecated or deleted Patient Resource ID (e.g., GET [base]/Patient?_id=pat01) return:

- 200 Ok Bundle with the inactive patient which is marked as inactive
- 200 Ok Bundle with no patient resource
- 605 • If merged, 200 Ok Bundle with both the target and old patient resources

3.93.4.2 Mobile Patient Identity Feed Response

3.93.4.2.1 Trigger Events

A Consumer sends the Mobile Patient Identity Feed Response to the Supplier when the Feed Request Message is fully processed.

610 **3.93.4.2.2 Message Semantics**

A Consumer responds to the Mobile Patient Identity Feed Request with an HTTP Status of 2xx with a Bundle Resource with the `type` set to “message” and one `entry` that is a MessageHeader Resource that reports the outcome of processing the Mobile Patient Identity Feed, or an error code, 4xx or 5xx.

615 A Consumer who is a Patient Identity Manager shall return an `entry` for each Patient Resource in the Mobile Patient Identity Feed Request with an `entry.response.status` set depending on the processing of the Patient Resources based on the batch processing rules for FHIR: <http://hl7.org/fhir/http.html#brules>. A status other than 2xx shall also include an `OperationOutcome` in `error.response.outcome` explaining the error.

620 **3.93.4.2.3 Expected Actions**

The Supplier receives the response and continues with its workflow.

3.93.5 Security Considerations

See ITI TF-1: 49.5 for security considerations for the PMIR Profile.

See ITI TF-2x: Appendix Z.8 for common mobile security considerations.

625 The Mobile Patient Identity Feed transaction should have both server authentication and client authentication, so that the client knows that the feed is going to the correct destination (server) and that the destination (server) knows the authenticity of the source (client). The content needs to be protected against integrity failures, and confidentiality failures. The common use of https, with server-side authentication, can address most of these requirements, however common https
630 does not address client authentication. For this client authentication function, one could either use the mutual-authenticated-TLS found in ATNA, or OAuth mechanism found in IUA. Other solutions can be used as appropriate agreement between client and server.

3.93.5.1 Security Audit Considerations

635 The Mobile Patient Identity Feed transaction is a Patient Record Message event as defined in ITI TF-2a: 3.20.4.1.1.1-1.

Note that the same audit message is recorded by both Supplier and Consumer. The difference being the Audit Source element. Both sides record to show consistency between message sent by the Supplier and action taken at the Consumer.

The actors involved shall record audit events according to the following:

640

3.93.5.1.1 Supplier audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110110, DICOM, “Patient Record”)
	EventActionCode	M	EV(message, http://hl7.org/fhir/bundle-type, “message”)
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV(“ITI-93”, “IHE Transactions”, “Mobile Patient Identity Feed”)
Source (Supplier) (1)			
Destination (Consumer) (1)			
Audit Source (Supplier) (1)			
Patient (1..N) Patient Identities in the message			
Message Identity (1)			

645 Where:

Source AuditMessage/ ActiveParticipant	UserID	U	not specialized
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	RoleIDCode	M	EV(110153, DCM, “Source”)
	NetworkAccessPointTypeCode	M	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Destination AuditMessage/ ActiveParticipant	UserID	M	http endpoint URI.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	M	“false”
	RoleIDCode	M	EV(110152, DCM, “Destination”)
	NetworkAccessPointTypeCode	M	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Audit Source AuditMessage/ AuditSourceIdentification	AuditSourceID	U	not specialized
	AuditEnterpriseSiteID	U	not specialized
	AuditSourceTypeCode	U	not specialized

650

Patient (AuditMessage/ ParticipantObjectIdent ification) (1..N)	ParticipantObjectTypeCode	M	“1” (Person)
	ParticipantObjectTypeCodeRole	M	“1” (Patient)
	ParticipantObjectDataLifeCycle	U	<i>not specialized</i>
	ParticipantObjectIDTypeCode	M	<i>not specialized</i>
	ParticipantObjectSensitivity	U	<i>not specialized</i>
	ParticipantObjectID	M	The Patient._id value
	ParticipantObjectName	U	<i>not specialized</i>
	ParticipantObjectQuery	U	<i>not specialized</i>
	ParticipantObjectDetail	U	<i>not specialized</i>

Message Identity (AuditMessage/ ParticipantObjectIdent ification)	ParticipantObjectTypeCode	M	EV(MessageHeader, http://hl7.org/fhir/resource-types, “MessageHeader”)
	ParticipantObjectTypeCodeRole	U	<i>not specialized</i>
	ParticipantObjectDataLifeCycle	U	<i>not specialized</i>
	ParticipantObjectIDTypeCode	U	<i>not specialized</i>
	ParticipantObjectSensitivity	U	<i>not specialized</i>
	ParticipantObjectID	M	MessageHeader._id value
	ParticipantObjectName	M	MessageHeader.eventUri value
	ParticipantObjectQuery	U	<i>not specialized</i>
	ParticipantObjectDetail	U	<i>not specialized</i>

655 3.93.5.1.2 Consumer audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110110, DICOM, “Patient Record”)
	EventActionCode	M	EV(message, http://hl7.org/fhir/bundle-type, “message”)
	EventDateTime	M	<i>not specialized</i>
	EventOutcomeIndicator	M	<i>not specialized</i>
	EventTypeCode	M	EV(“ITI-93”, “IHE Transactions”, “Mobile Patient Identity Feed”)
Source (Supplier) (1)			
Destination (Consumer) (1)			
Audit Source (Consumer) (1)			
Patient (1..N) Patient Identities in the message			
Message Identity (1)			

660

Where:

Source (AuditMessage/ ActiveParticipant)	<i>UserID</i>	<i>U</i>	<i>not specialized</i>
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>U</i>	<i>not specialized</i>
	<i>RoleIDCode</i>	<i>M</i>	EV(110153, DCM, “Source”)
	<i>NetworkAccessPointTypeCode</i>	<i>M</i>	“1” for machine (DNS) name, “2” for IP address
	<i>NetworkAccessPointID</i>	<i>M</i>	The machine name or IP address.

Destination (AuditMessage/ ActiveParticipant)	<i>UserID</i>	<i>M</i>	http endpoint URI.
	<i>AlternativeUserID</i>	<i>U</i>	<i>not specialized</i>
	<i>UserName</i>	<i>U</i>	<i>not specialized</i>
	<i>UserIsRequestor</i>	<i>M</i>	“false”
	<i>RoleIDCode</i>	<i>M</i>	EV(110152, DCM, “Destination”)
	<i>NetworkAccessPointTypeCode</i>	<i>M</i>	“1” for machine (DNS) name, “2” for IP address
	<i>NetworkAccessPointID</i>	<i>M</i>	The machine name or IP address.

Audit Source (AuditMessage/ AuditSourceIdentification)	<i>AuditSourceID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditEnterpriseSiteID</i>	<i>U</i>	<i>not specialized</i>
	<i>AuditSourceTypeCode</i>	<i>U</i>	<i>not specialized</i>

665

Patient (AuditMessage/ ParticipantObjectIdentification) (1..N)	<i>ParticipantObjectTypeCode</i>	<i>M</i>	“1” (Person)
	<i>ParticipantObjectTypeCodeRole</i>	<i>M</i>	“1” (Patient)
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	<i>M</i>	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectID</i>	<i>M</i>	The Patient._id value
	<i>ParticipantObjectName</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>

Message Identity (AuditMessage/ ParticipantObjectIdentification)	<i>ParticipantObjectTypeCode</i>	<i>M</i>	EV(MessageHeader, http://hl7.org/fhir/resource-types, “MessageHeader”)
	<i>ParticipantObjectTypeCodeRole</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectDataLifeCycle</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectIDTypeCode</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectSensitivity</i>	<i>U</i>	<i>not specialized</i>
	<i>ParticipantObjectID</i>	<i>M</i>	MessageHeader._id value
	<i>ParticipantObjectName</i>	<i>M</i>	MessageHeader.eventUri value
	<i>ParticipantObjectQuery</i>	<i>U</i>	<i>not specialized</i>

	<i>ParticipantObjectDetail</i>	<i>U</i>	<i>not specialized</i>
--	--------------------------------	----------	------------------------

Add Section 3.94

670 3.94 Subscribe to Patient Updates [ITI-94]

3.94.1 Scope

The Subscribe to Patient Updates transaction allows a Patient Identity Subscriber to subscribe to a Mobile Patient Resource Feed [ITI-93] depending on the requested criteria.

3.94.2 Actor Roles

675 **Table 3.94.2-1: Actor Roles**

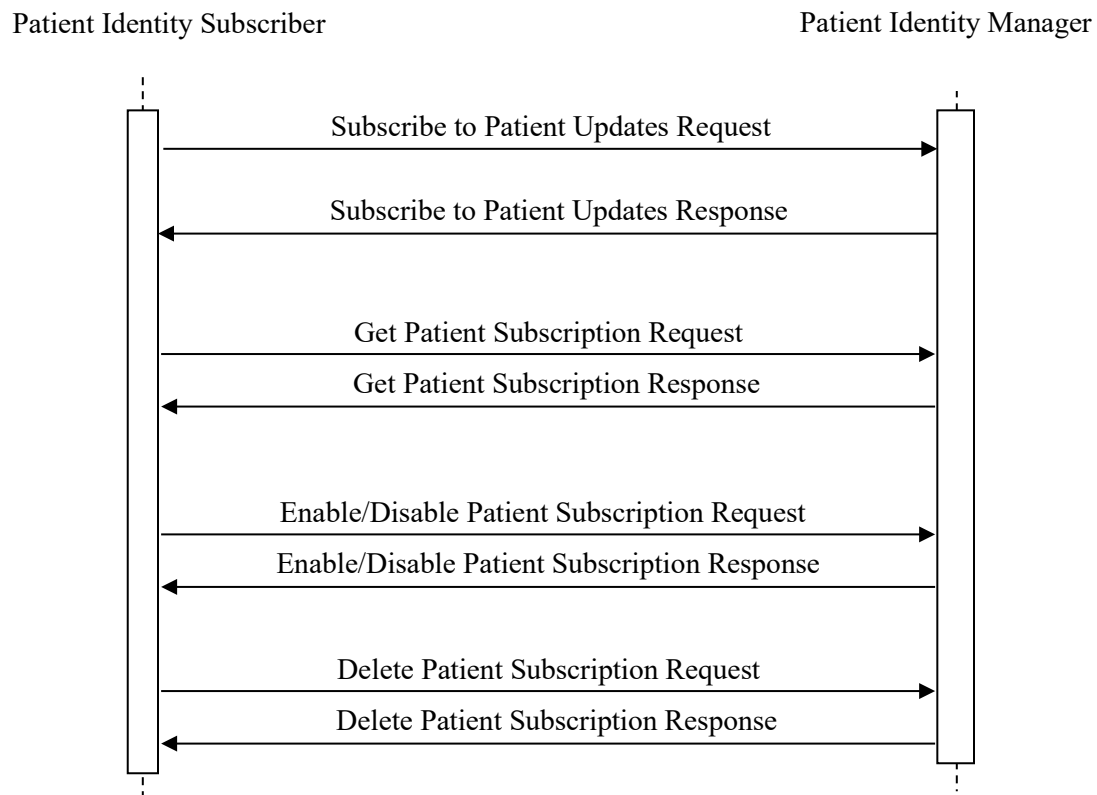
Actor:	Patient Identity Subscriber
Description:	Sends a Subscription request to the Patient Identity Manager
Actor:	Patient Identity Manager
Description:	Accepts a Subscription request and returns where the Subscription can be accessed.

3.94.3 Referenced Standards

- HL7 FHIR standard Release 4 <http://hl7.org/fhir/R4/index.html>

3.94.4 Messages

680 The Patient Identity Manager shall support all these interactions. The Patient Identity Subscriber shall utilize the Subscribe to Patient Updates Request and may utilize other interactions as required by its application workflow.

**Figure 3.94.4-1: Interaction Diagram**

685 3.94.4.1 Subscribe to Patient Updates Request Message

The Subscribe to Patient Updates message is a FHIR create operation on a Subscription Resource.

3.94.4.1.1 Trigger Events

690 A Patient Identity Subscriber triggers a Subscribe to Patient Updates Request to a Patient Identity Manager according to the business rules in its system. These business rules are outside the scope of this transaction.

3.94.4.1.2 Message Semantics

695 A Patient Subscriber initiates a FHIR create request using HTTP POST as defined at <https://www.hl7.org/fhir/R4/http.html#create> on a Subscription Resource as defined at <https://www.hl7.org/fhir/R4/subscription.html>.

A Patient Identity Manager shall support accepting a request for both the JSON and the XML messaging formats as defined in FHIR. A Patient Subscriber shall send either the JSON or the XML messaging formats as defined in FHIR. See ITI TF-2x: Appendix Z.6 for more details.

See ITI TF-2x: Appendix W for informative implementation material for this transaction.

700 3.94.4.1.2.1 FHIR Subscription Resource Constraints

A Patient Identity Subscriber shall create a Subscription Resource. The Subscription Resource shall be further constrained as described in Table 3.94.4.1.2.1-1. The Element column in Table 3.94.4.1.2.1-1 references the object model defined at

<https://www.hl7.org/fhir/R4/subscription.html#resource>.

705 **Table 3.94.4.1.2.1-1: Subscription Resource Constraints**

Element & Cardinality	Constraints
<code>channel.type</code> [1..1]	The type shall be “message”
<code>channel.endpoint</code> [1..1]	The endpoint must be a defined URL.
<code>channel.payload</code> [1..1]	The payload shall be either: application/fhir+json application/fhir+xml
<code>status</code> [1..1]	The status shall be “requested”
<code>contact</code> [0..*]	The contact for the subscription.
<code>contact.system</code> [1..1]	The system of the contact value.
<code>contact.value</code> [1..1]	The value where the contact can be reached.
<code>criteria</code> [1..1]	See Section 3.94.4.1.2.1.1

3.94.4.1.2.1.1 Criteria Constraints

The values for `criteria` enable Consumers to limit results based on what Patients they are concerned with.

710 The Patient Identity Subscriber shall support the ability to subscribe to the Mobile Patient Identity Feed [ITI-93] with at least one `criteria`. The Patient Identity Manager shall support processing subscriptions with all `criteria`. The `criteria` list includes:

- Patient – to subscribe to all Patient updates
- 715 • Patient?_id=X – to subscribe to updates for a single Patient where X is the id of the Patient Resource
- Patient?organization=X – to subscribe to updates for Patients related to a single Organization
- 720 • Patient?identifier=X – to subscribe to updates for Patients based on their identifier. Since X is a token parameter type, a subscriber may limit by system, value, or both. See <http://hl7.org/fhir/search.html#token>.

3.94.4.1.3 Expected Actions

A Patient Identity Manager shall accept the request, and return an HTTP 201 response when the Subscription is created or an error code with an `OperationOutcome` if an error occurs as per <https://www.hl7.org/fhir/http.html#create>.

- 725 A Patient Identity Manager shall store the Subscription Resource and manage the subscription to enable the Mobile Patient Identity Feed [ITI-93]. How it creates and manages the subscription is not specified by IHE. When the subscription has been activated, the Subscription Resource status shall be changed to “active.”

- 730 If an error occurs at any time with an active subscription, the Patient Identity Manager shall update the Subscription Resource and set the status to “error” and the error element with the error message. The Patient Identity Subscriber may use the Get Patient Subscription Request to get the current status of the Subscription. See Section 3.94.4.3.

3.94.4.2 Subscribe to Patient Updates Response

3.94.4.2.1 Trigger Events

- 735 A Patient Identity Manager sends the Subscribe to Patient Updates Response to the Patient Subscriber when the subscription request is received.

3.94.4.2.2 Message Semantics

- 740 A Patient Identity Manager responds to the Subscribe to Patient Updates Request with an HTTP Status of 201 with the `Location` header set to the created Subscription Resource or an error as defined at <https://www.hl7.org/fhir/http.html#create>.

3.94.4.2.3 Expected Actions

A Patient Identity Subscriber has received the response and continues with its workflow. It may maintain the returned id if the Subscription Resource needs to be queried, disabled, or deleted later.

745 **3.94.4.3 Get Patient Subscription Request/Response Message**

A Patient Identity Subscriber can retrieve from the Patient Identity Manager the current details of a subscription by accessing the `Location` returned by the Subscribe to Patient Updates Response as defined at <https://www.hl7.org/fhir/http.html#read> on the Subscription Resource.

A Patient Identity Manager shall return the current Subscription Resource.

750 **3.94.4.4 Enable/Disable Patient Subscription Request/Response Message**

A Patient Identity Subscriber can enable or disable a subscription on the Patient Identity Manager by accessing the `Location` returned by the Subscribe to Patient Updates Response as defined at <https://www.hl7.org/fhir/http.html#update> on the Subscription Resource. This can be used to temporarily disable the subscription by changing the `status` to “off” or re-enable a subscription by changing the `status` to “requested.”

A Patient Identity Manager shall disable a subscription when the `status` is “off.”

The Patient Identity Manager shall handle changes with a `status` of “requested” as per Section 3.94.4.1.3.

3.94.4.5 Delete Patient Subscription Request/Response Message

760 A Patient Identity Subscriber can delete a subscription from the Patient Identity Manager by accessing the `Location` returned by the Subscribe to Patient Updates Response as defined at <https://www.hl7.org/fhir/http.html#delete> on the Subscription Resource.

A Patient Identity Manager shall stop sending the Mobile Patient Identity Feed to the Patient Identity Consumer endpoint defined in the `Subscription.channel`.

765 **3.94.5 Security Considerations**

See ITI TF-1: Section 49.5 for security considerations for the PMIR Profile.

See ITI TF-2x: Appendix Z.8 for common mobile security considerations.

770 The subscription is made by the Patient Subscriber, which must be authorized at the Patient Identity Manager to request subscriptions. This authorization is valid at the time the Subscribe to Patient Update transaction request/response. The timeout associated with the client authorization does not impact the life of the subscription. However, the Patient Subscriber identity has no impact on the resulting Mobile Patient Identity Feed endpoint authentication or authorization. There is no communication of security credentials for the Mobile Patient Identity Feed transaction within the Subscribe to Patient Update transactions.

775 **3.94.5.1 Security Audit Considerations**

The Subscribe to Patient Updates transaction is a REST Information event as defined in ITI TF-2a: 3.20.4.1.1.1-1.

780

Note that the same audit message is recorded by both Patient Identity Subscriber and Patient Identity Manager, the difference being the Audit Source element. Both actors audit this transaction to show consistency between the request by the Patient Identity Subscriber and the action taken by the Patient Identity Manager.

The actors involved shall record audit events according to the following:

3.94.5.1.1 Patient Identity Subscriber audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV("rest", http://terminology.hl7.org/CodeSystem/audit-event-type, "rest")
	EventActionCode	M	code - one of (create, read, update, delete) system - http://hl7.org/fhir/restful-interactions
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized
	EventTypeCode	M	EV("ITI-94", "IHE Transactions", "Subscribe to Patient Updates")
Source (Patient Subscriber) (1)			
Human Requestor (0..n)			
Destination (Patient Identity Manager) (1)			
Audit Source (Patient Subscriber) (1)			
Patient (0..1) Patient if specific.			
Query Parameters (1)			

785

Where:

Source AuditMessage/ ActiveParticipant	UserID	U	not specialized
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Human Requestor (if known) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	U	not specialized
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	U	not specialized
	NetworkAccessPointID	U	not specialized

Destination (AuditMessage/ ActiveParticipant)	UserID	M	http endpoint URI.
	AlternativeUserID	U	not specialized
	UserName	U	not specialized
	UserIsRequestor	M	“false”
	RoleIDCode	M	EV(110152, DCM, “Destination”)
	NetworkAccessPointTypeCode	M	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Audit Source (AuditMessage/ AuditSourceIdentification)	AuditSourceID	U	not specialized
	AuditEnterpriseSiteID	U	not specialized
	AuditSourceTypeCode	U	not specialized

790

Patient (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“1” (Person)
	ParticipantObjectTypeCodeRole	M	“1” (Patient)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	not specialized
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	M	The Patient._id value
	ParticipantObjectName	U	not specialized
	ParticipantObjectQuery	U	not specialized
	ParticipantObjectDetail	U	not specialized

Query Parameters (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	“2” (system object)
	ParticipantObjectTypeCodeRole	M	“24” (query)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	EV(“ITI-94, “IHE Transactions”, “Subscribe to Patient Update”)
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	C	Subscription._id value – when known (empty on create)
	ParticipantObjectName	U	not specialized
	ParticipantObjectQuery	M	the Subscription.criteria value
	ParticipantObjectDetail	U	not specialized

3.94.5.1.2 Patient Identity Manager audit message:

	Field Name	Opt	Value Constraints
Event (AuditMessage/ EventIdentification)	EventID	M	EV(“rest”, http://terminology.hl7.org/CodeSystem/audit-event-type, “rest”)
	EventActionCode	M	code - one of (create, read, update, delete) system - http://hl7.org/fhir/restful-interactions
	EventDateTime	M	not specialized
	EventOutcomeIndicator	M	not specialized

	EventTypeCode	M	EV(“ITI-94”, “IHE Transactions”, “Subscribe to Patient Updates”)
Source (Patient Subscriber) (1)			
Human Requestor (0..n)			
Destination (Patient Identity Manager) (1)			
Audit Source (Patient Identity Manager) (1)			
Patient (0..1) Patient if specific.			
Query Parameters (1)			

795 Where:

Source AuditMessage/ ActiveParticipant	UserID	<u>U</u>	<i>not specialized</i>
	AlternativeUserID	U	<i>not specialized</i>
	UserName	U	<i>not specialized</i>
	UserIsRequestor	U	<i>not specialized</i>
	RoleIDCode	M	EV(110153, DCM, “Source”)
	NetworkAccessPointTypeCode	M	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Human Requestor (if known) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	U	<i>not specialized</i>
	UserName	U	<i>not specialized</i>
	UserIsRequestor	U	<i>not specialized</i>
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	U	<i>not specialized</i>
	NetworkAccessPointID	U	<i>not specialized</i>

Destination AuditMessage/ ActiveParticipant	UserID	M	http endpoint URI.
	AlternativeUserID	U	<i>not specialized</i>
	UserName	U	<i>not specialized</i>
	UserIsRequestor	M	“false”
	RoleIDCode	M	EV(110152, DCM, “Destination”)
	NetworkAccessPointTypeCode	M	“1” for machine (DNS) name, “2” for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Audit Source AuditMessage/ AuditSourceIdentification	AuditSourceID	U	<i>not specialized</i>
	AuditEnterpriseSiteID	U	<i>not specialized</i>
	AuditSourceTypeCode	U	<i>not specialized</i>

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Patient (AuditMessage/ ParticipantObjectI dentification)	ParticipantObjectTypeCode	M	“1” (Person)
	ParticipantObjectTypeCodeRole	M	“1” (Patient)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	not specialized
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	M	The Patient._id value
	ParticipantObjectName	U	not specialized
	ParticipantObjectQuery	U	not specialized
	ParticipantObjectDetail	U	not specialized

Query Parameters (AuditMessage/ ParticipantObjectI dentification)	ParticipantObjectTypeCode	M	“2” (system object)
	ParticipantObjectTypeCodeRole	M	“24” (query)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	EV(“ITI-94, “IHE Transactions”, “Subscribe to Patient Update”)
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	C	Subscription._id value
	ParticipantObjectName	U	not specialized
	ParticipantObjectQuery	M	the Subscription.criteria value
	ParticipantObjectDetail	U	not specialized

Replace Section 3.78.2

(Note: This section is currently in the PDQm Trial Implementation Supplement)

805 3.78.2 Actor Roles

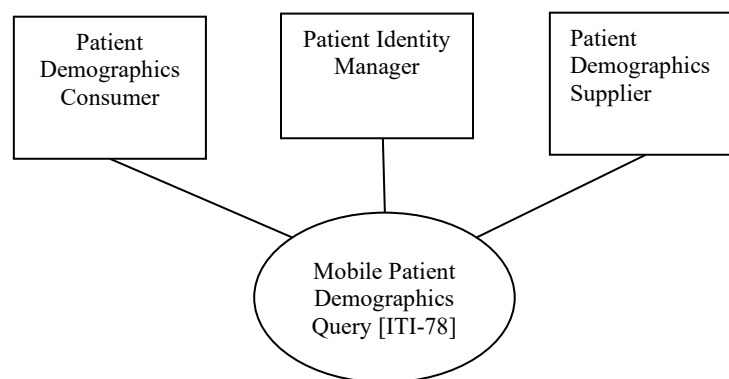
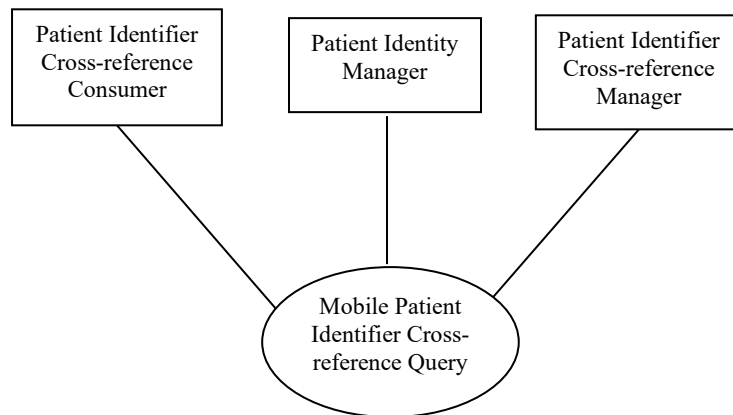


Figure 3.78.2-1: Use Case Diagram

Table 3.78.2-1: Actor Roles

Role:	Patient Demographics Consumer: Requests a list of patients matching the supplied set of demographics criteria (example: ID or Name) from the Patient Demographics Supplier. The Patient Demographics Consumer populates its attributes with demographic information received from the Patient Demographics Supplier.
Actor(s):	The following actors may play the role of Patient Demographics Consumer: Patient Demographics Consumer
Role:	Patient Demographics Supplier: Returns demographic information for all patients matching the demographics criteria provided by the Patient Demographics Consumer.
Actor(s):	The following actors may play the role of Patient Demographics Supplier: Patient Demographics Supplier Patient Identity Manager

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*Replace Section 3.83.2**(Note: This section is currently in the PIXm Trial Implementation Supplement)***3.83.2 Actor Roles**

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Figure 3.83.2-1: Use Case Diagram

Table 3.83.2-1: Actor Roles

Role:	Patient Identifier Cross-reference Consumer: Requests, from the Patient Identifier Cross-reference Manager, a list of patient identifiers matching the supplied Patient Identifier.
Actor(s):	The following actors may play the role of Patient Identifier Cross-reference Consumer: Patient Identifier Cross-reference Consumer
Role:	Patient Identifier Cross-reference Manager: Returns Cross-referenced Patient Identifiers for the patient that cross-matches the Patient Identifier criteria provided by the Patient Identifier Cross-reference Consumer.
Actor(s):	The following actors may play the role of Patient Identifier Cross-reference Manager: Patient Identifier Cross-reference Manager Patient Identity Manager