Integrating the Healthcare Enterprise

IHE IT Infrastructure
Technical Framework

Volume 2b
(ITI TF-2b)
Transactions Part B –
Sections 3.29 – 3.64

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1 Introduction

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Integrating the Healthcare Enterprise (IHE) is an initiative designed to stimulate the integration of the information systems that support modern healthcare institutions. Its fundamental objective is to ensure that in the care of patients all required information for medical decisions is both correct and available to healthcare professionals. The IHE initiative is both a process and a forum

220 for encouraging integration efforts. It defines a technical framework for the implementation of established messaging standards to achieve specific clinical goals. It includes a rigorous testing process for the implementation of this framework. And it organizes educational sessions and exhibits at major meetings of medical professionals to demonstrate the benefits of this framework and encourage its adoption by industry and users.

225 The approach employed in the IHE initiative is to support the use of existing standards, e.g., HL7[®][1], ASTM, DICOM[®][2], ISO, IETF, OASIS and others as appropriate, rather than to define new standards. IHE profiles further constrain configuration choices where necessary in these standards to ensure that they can be used in their respective domains in an integrated manner between different actors. When clarifications or extensions to existing standards are necessary,

230 IHE refers recommendations to the relevant standards bodies.

This initiative has numerous sponsors and supporting organizations in different medical specialty domains and geographical regions. In North America the primary sponsors are the Healthcare Information and Management Systems Society (HIMSS) and the Radiological Society of North America (RSNA). IHE Canada has also been formed. IHE Europe (IHE-EUR) is supported by a

235 large coalition of organizations including the European Association of Radiology (EAR) and European Congress of Radiologists (ECR), the Coordination Committee of the Radiological and Electromedical Industries (COCIR), Deutsche Röntgengesellschaft (DRG), the EuroPACS Association, Groupement pour la Modernisation du Système d'Information Hospitalier (GMSIH), Société Francaise de Radiologie (SFR), Società Italiana di Radiologia Medica

240 (SIRM), and the European Institute for health Records (EuroRec). In Japan IHE-J is sponsored by the Ministry of Economy, Trade, and Industry (METI); the Ministry of Health, Labor, and Welfare; and MEDIS-DC; cooperating organizations include the Japan Industries Association of Radiological Systems (JIRA), the Japan Association of Healthcare Information Systems Industry (JAHIS), Japan Radiological Society (JRS), Japan Society of Radiological Technology (JSRT),

245 and the Japan Association of Medical Informatics (JAMI). Other organizations representing healthcare professionals are invited to join in the expansion of the IHE process across disciplinary and geographic boundaries.

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

[2] DICOM is the registered trademark of the National Electrical Manufacturers Association for its standards publications relating to digital communications of medical information.

1.1 Overview of the Technical Framework

This document, the IHE IT Infrastructure Technical Framework (ITI TF), defines specific
implementations of established standards to achieve integration goals that promote appropriate
sharing of medical information to support optimal patient care. It is expanded annually, after a
period of public review, and maintained regularly through the identification and correction of
errata. The current version, Rev 14.0 for Final Text, specifies the IHE transactions defined and
implemented as of July 21, 2017. The latest version of the document is always available via the
Internet at http://ihe.net/Technical_Frameworks.

The IHE IT Infrastructure Technical Framework identifies a subset of the functional components
of the healthcare enterprise, called IHE actors, and specifies their interactions in terms of a set of
coordinated, standards-based transactions. It describes this body of transactions in progressively
greater depth. Volume 1 (ITI TF-1) provides a high-level view of IHE functionality, showing the
transactions organized into functional units called integration profiles that highlight their
capacity to address specific IT Infrastructure requirements.

Volumes 2a, 2b, and 2x of the IT Infrastructure Technical Framework provides detailed technical
descriptions of each IHE transaction used in the IT Infrastructure Integration Profiles.

Volume 3 contains content specification and specifications used by multiple transactions. These
volumes are consistent and can be used in conjunction with the Integration Profiles of other IHE
domains.

The other domains within the IHE initiative also produce Technical Frameworks within their
respective areas that together form the IHE Technical Framework. For example, the following
IHE Technical Framework(s) are some of those which are available:

- IHE IT Infrastructure Technical Framework

- IHE Cardiology Technical Framework

- IHE Laboratory Technical Framework

- IHE Patient Care Coordination Technical Framework

- IHE Radiology Technical Framework

Where applicable, references are made to other technical frameworks. For the conventions on
referencing other frameworks, see ITI TF-1: 1.6.3.

1.2 Overview of IT Infrastructure Technical Framework Volumes 2a, 2b, 2x, and 3

The remainder of Section 1 further describes the general nature, purpose and function of the
Technical Framework. Section 2 presents the conventions used in this volume to define IHE
transactions.

Section 3 defines transactions in detail, specifying the roles for each actor, the standards
employed, the information exchanged, and in some cases, implementation options for the
transaction. Section 3 is divided into two parts:

285   •   Volume 2a: Sections 3.1 - 3.28 corresponding to transactions [ITI-1] through [ITI-28].

       •   Volume 2b: Sections 3.29 - 3.64 corresponding to transactions [ITI-29] through [ITI-64].

Volume 2x contains all appendices providing technical details associated with the transactions.

Volume 3, Section 4 contains specifications that are used by multiple transactions.

Volume 3, Section 5 contains Content Specifications.

1.3 Audience

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The intended audience of this document is:

       •   IT departments of healthcare institutions

       •   Technical staff of vendors planning to participate in the IHE initiative

       •   Experts involved in standards development

295   •   Those interested in integrating healthcare information systems and workflows

1.4 Relationship to Standards

The IHE Technical Framework identifies functional components of a distributed healthcare environment (referred to as IHE actors), solely from the point of view of their interactions in the healthcare enterprise. At its current level of development, it defines a coordinated set of
300   transactions based on ASTM, DICOM, HL7, IETF, ISO, OASIS and W3C standards. As the scope of the IHE initiative expands, transactions based on other standards may be included as required.

In some cases, IHE recommends selection of specific options supported by these standards; however, IHE does not introduce technical choices that contradict conformance to these
305   standards. If errors in or extensions to existing standards are identified, IHE's policy is to report them to the appropriate standards bodies for resolution within their conformance and standards evolution strategy.

IHE is therefore an implementation framework, not a standard. Conformance claims for products must still be made in direct reference to specific standards. In addition, vendors who have
310   implemented IHE integration capabilities in their products may publish IHE Integration Statements to communicate their products' capabilities. Vendors publishing IHE Integration Statements accept full responsibility for their content. By comparing the IHE Integration Statements from different products, a user familiar with the IHE concepts of actors and integration profiles can determine the level of integration between them. See ITI TF-2x:
315   Appendix C for the format of IHE Integration Statements.

1.5 Relationship to Real-world Architectures

The IHE actors and transactions described in the IHE Technical Framework are abstractions of the real-world healthcare information system environment. While some of the transactions are traditionally performed by specific product categories (e.g., HIS, Clinical Data Repository,

320 Radiology Information Systems, Clinical Information Systems or Cardiology Information
Systems), the IHE Technical Framework intentionally avoids associating functions or actors with
such product categories. For each actor, the IHE Technical Framework defines only those
functions associated with integrating information systems. The IHE definition of an actor should
therefore not be taken as the complete definition of any product that might implement it, nor

325 should the framework itself be taken to comprehensively describe the architecture of a healthcare
information system.

The reason for defining actors and transactions is to provide a basis for defining the interactions
among functional components of the healthcare information system environment. In situations
where a single physical product implements multiple functions, only the interfaces between the

330 product and external functions in the environment are considered to be significant by the IHE
initiative. Therefore, the IHE initiative takes no position as to the relative merits of an integrated
environment based on a single, all-encompassing information system versus one based on
multiple systems that together achieve the same end. IHE demonstrations emphasize the
integration of multiple vendors' systems based on the IHE Technical Framework.

335 1.6 Comments

IHE International welcomes comments on this document and the IHE initiative. They can be
submitted using the Web-based comment form at http://www.ihe.net/ITI_Public_Comments or
by sending an email to the co-chairs and secretary of the IT Infrastructure domain committees at
iti@ihe.net.

340 1.7 Copyright Permission

Health Level Seven, Inc., has granted permission to the IHE to reproduce tables from the HL7
standard. The HL7 tables in this document are copyrighted by Health Level Seven, Inc.
The National Electrical Manufacturers Association (NEMA) has granted permission to the IHE
to incorporate portions of the DICOM standard.

345 All rights reserved. Material drawn from these documents is credited where used.

2   Conventions

This document has adopted the following conventions for representing the framework concepts and specifying how the standards upon which the IHE IT Infrastructure Technical Framework is based should be applied.

350 ## 2.1 The Generic IHE Transaction Model

Transaction descriptions are provided in Section 3. In each transaction description, the actors, the roles they play, and the transactions between them are presented as use cases.

The generic IHE transaction description includes the following components:

Scope: a brief description of the transaction.

355   Use case roles: textual definitions of the actors and their roles, with a simple diagram relating them, e.g.,:
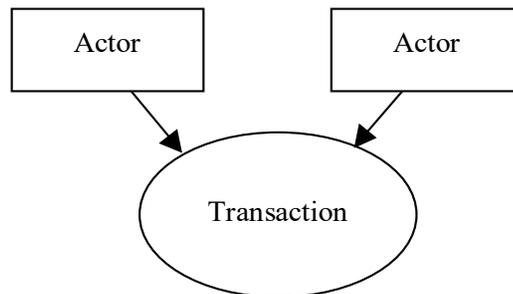
Referenced Standards: the standards (stating the specific parts, chapters or sections thereof) to be used for the transaction.

360   *Interaction Diagram*: a graphical depiction of the actors and messages that support the transaction, with related processing within an actor shown as a rectangle and time progressing downward, similar to:
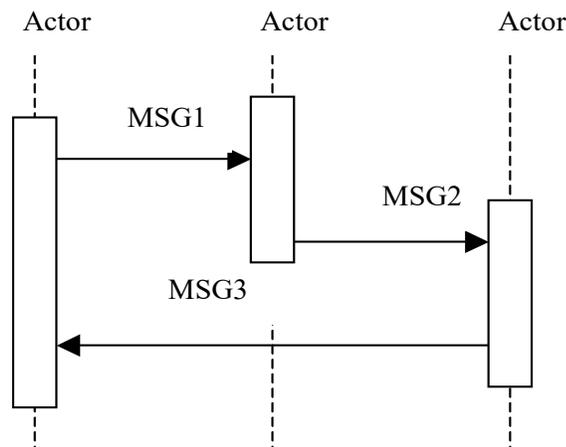
365   The interaction diagrams used in the IHE IT Infrastructure Technical Framework are modeled after those described in Grady Booch, James Rumbaugh, and Ivar Jacobson, *The Unified Modeling Language User Guide*, ISBN 0-201-57168-4. Simple acknowledgment messages are often omitted from the diagrams for brevity. One or more messages may be required to satisfy a transaction. Each message is represented as an arrow starting from

370   the actor initiating the message.

Message definitions: descriptions of each message involved in the transaction, the events that trigger the message, its semantics, and the actions that the message triggers in the receiver.

2.2 HL7 Profiling Conventions

375   See ITI TF-2x: Appendix C for the HL7 profiling conventions as well as the networking implementation guidelines.

2.3 Use of Coded Entities and Coding Schemes

IHE does not produce, maintain or otherwise specify a coding scheme or other resource for controlled terminology (coded entities). Where applicable, coding schemes required by the HL7

380   and DICOM standards take precedence. In the cases where such resources are not explicitly identified by standards, implementations may utilize any resource (including proprietary or local) provided any licensing/copyright requirements are satisfied.

3   IHE Transactions

385   This section defines each IHE transaction in detail, specifying the standards used, the information transferred, and the conditions under which the transaction is required or optional.

3.29 Intentionally Left Blank

3.30 Patient Identity Management [ITI-30]

This section corresponds to transaction ITI-30, "Patient Identity Management" of the IHE IT Infrastructure Technical Framework. Transaction ITI-30 is used by the actors Patient
390   Demographics Supplier and Patient Demographics Consumer.

3.30.1 Scope

This transaction transmits patient demographics in a patient identification domain (i.e., patient identifiers assigned by the same assigning authority).

The term "patient demographics" is intended to convey the patient identification and full identity
395   and also information on persons related to this patient, such as primary caregiver, family doctor, guarantor, next of kin.

The transaction contains events for creating, updating, merging, linking and unlinking patients.

It enables the sending system to qualify the reliability of a patient identity, and the type of identity used (official name, alias for VIP, unknown patient).

400   The transaction can be used in acute care settings for both inpatients (i.e., those who are assigned a bed at the facility) and outpatients (i.e., those who are not assigned a bed at the facility).

The transaction can also be used in a pure ambulatory environment.

3.30.2 Use Case Roles
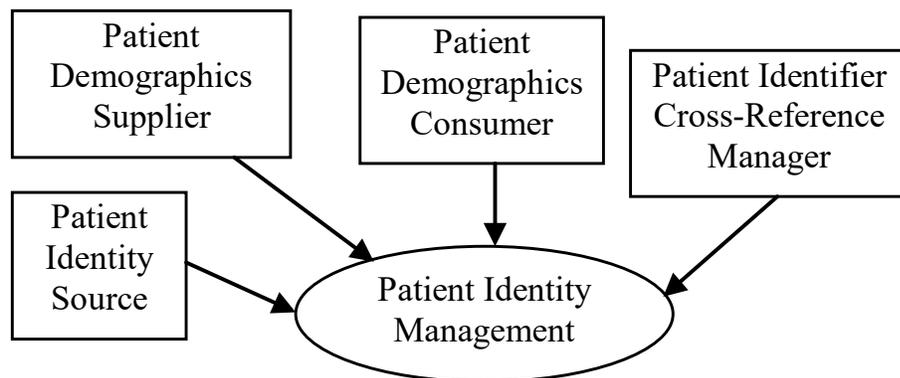
405   **Actor:** Patient Demographics Supplier

Role: Adds and modifies patient demographics.

Actor: Patient Demographics Consumer

Role: Receives patient demographics.

Actor: Patient Identity Source

410   **Role:** Adds and modifies patient demographics.

Actor: Patient Identifier Cross-Reference Manager

Role: Receives patient demographics.

3.30.3 Referenced Standards

HL7 2.5 Chapters 2, 3, 6, 15

415   ### 3.30.4 Message sets and options

Transaction ITI-30 supports two options, "Merge" and "Link/Unlink", in order to accommodate the various methods used by healthcare organizations to reconcile duplicated identities.

Any Patient Demographics Supplier or Patient Demographics Consumer Actor SHALL support at least one of the two options "Merge" and "Link/Unlink" or both, according to the IHE national
420   extensions of this transaction. Any implementation framework will mandate both actors to support the same option (see Sections 3.30.4.1 and 3.30.4.2).

Patient Identity Source and Patient Identity Cross-Reference Manager Actors may support the Pediatric Demographics Option (see Section 3.30.4.3).

3.30.4.1 Required message subset with option "Merge"

425

Event	Trigger	Message Static definition
Create new patient	A28	ADT^A28^ADT_A05
Update patient information	A31	ADT^A31^ADT_A05
Change Patient Identifier List	A47	ADT^A47^ADT_A30
Merge two patients	A40	ADT^A40^ADT_A39

3.30.4.2 Required message subset with option "Link/Unlink"

Event	Trigger	Message Static definition
Create new patient	A28	ADT^A28^ADT_A05
Update patient information	A31	ADT^A31^ADT_A05
Change Patient Identifier List	A47	ADT^A47^ADT_A30
Link Patient Information	A24	ADT^A24^ADT_A24
Unlink Patient Information	A37	ADT^A37^ADT_A37

3.30.4.3 Optionality of Pediatric Demographics Fields

430   The Pediatric Demographics Option does not require Patient Identity Source Actors to include any attributes not already required by the corresponding HL7 message (as is described in the following sections). This minimal set of requirements enables inclusion of the largest range of Patient Identity Source Actor systems.

The Pediatric Demographics Option does place additional requirements on the Patient Identifier
435   Cross-reference Manager Actor, requiring them to accept and consider in matching* a set of HL7 attributes beyond what is required by standard PIX. See Table 3.30.4.3-1 for a description of these additional requirements. For example, we would expect that two patients with all furnished data elements identical except the First Name (e.g., "Maria" vs. "Marina"), and consecutive Birth Order values would not be automatically linked or merged by the Patient Identifier Cross-
440   Reference Manager.

3.30.4.4 Acknowledgement Support

An actor that claims support for the Acknowledgement Support Option shall be capable of using the enhanced acknowledgement mode as defined in the HL7 v2.x standard. See HL7 Volume 2C, Section C.2.3 for further details.

445   ### 3.30.4.5 Ambulatory Patient Data

If the Patient Demographics Supplier supports the Ambulatory Patient Data Option, it SHALL supply the patient address in field PID-11 for ambulatory patients whenever this address is known.

3.30.5 Common HL7 Message Segments

450   This section describes the common HL7 message segments used in transaction ITI-30.

Each table represents a segment. Fields for which a precise usage description is needed, particularly those having usage C (conditional), are commented on below the table. The optional fields are usually not commented on.

3.30.5.1 MSH - Message Header Segment

455   Standard Reference: HL7 Version 2.5, Chapter 2 (Section 2.15, "Message control")

This segment defines the intent, supplier, destination, and some specifics of the syntax of the message. It also uniquely identifies the message itself and dates its production.

Table 3.30-1: MSH - Message Header

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	1	ST	R	[1..1]		00001	Field Separator
2	4	ST	R	[1..1]		00002	Encoding Characters
3	227	HD	R	[1..1]		00003	Sending Application
4	227	HD	R	[1..1]		00004	Sending Facility

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
5	227	HD	R	[1..1]		00005	Receiving Application
6	227	HD	R	[1..1]		00006	Receiving Facility
7	26	TS	R	[1..1]		00007	Date/Time of Message
8	40	ST	X	[0..0]		00008	Security
9	15	MSG	R	[1..1]		00009	Message Type
10	20	ST	R	[1..1]		00010	Message Control Id
11	3	PT	R	[1..1]		00011	Processing Id
12	60	VID	R	[1..1]		00012	Version ID
13	15	NM	O	[0..1]		00013	Sequence Number
14	180	ST	X	[0..0]		00014	Continuation Pointer
15	2	ID	O	[0..1]	0155	00015	Accept Acknowledgement Type
16	2	ID	O	[0..1]	0155	00016	Application Acknowledgement Type
17	3	ID	RE	[1..1]	0399	00017	Country Code
18	16	ID	C	[0..1]	0211	00692	Character Set
19	250	CE	RE	[0..1]		00693	Principal Language of Message
20	20	ID	X	[0..0]	0356	01317	Alternate Character Set Handling Scheme
21	427	EI	RE	[0..*]		01598	Message Profile Identifier

460 **MSH-1 Field Separator**, required: This Technical Framework requires that applications support as the recommended value specified in the HL7 standard, which is | (ASCII 124). See volume 2x: Appendix C.

MSH-2 Encoding Characters, required: This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent
465 separator. This Technical Framework requires that applications support the recommended values for encoding characters as specified in the HL7 standard. The values are ^~\& (ASCII 94, 126, 92, and 38, respectively). See ITI TF-2x: Appendix C.

MSH-3 Sending Application (HD) and **MSH-5 Receiving Application (HD)**, required. See the constrainable profile definition of data type HD.

470 **MSH-4 Sending Facility (HD)** and **MSH-6 Receiving Facility (HD)**, required. See the constrainable profile definition of data type HD.

MSH-9 Message Type (MSG), required:

Components: <Message Code (ID)> ^ <Trigger Event (ID)> ^ <Message Structure (ID)>

Definition: This field contains the message type, trigger event, and the message structure ID for
475 the message. All three components are required.

MSH-10 Message Control Id (ST), required:

Definition: This field contains a number or other identifier that uniquely identifies the message in the context of exchange between trading partners. Each message should be given a unique identifier by the sending system. The receiving system will echo this ID back to the sending system in the Message Acknowledgment segment (MSA). The combination of this identifier and the name of the sending application (MSH-3) should be unique across the healthcare enterprise.

MSH-12 Version ID (VID), required:

Components: <Version ID (ID)> ^ <Internationalization Code (CE)> ^ <International Version ID (CE)>

Definition: This field is matched by the receiving system to its own version to be sure the message will be interpreted correctly.

The first component SHALL be populated with the value "2.5" representing HL7 Version 2.5.

MSH-15 Accept Acknowledgment Type (ID), optional.

As a minimal requirement for all actors, the Original Acknowledgement Mode shall be supported, in which case this field of the message will remain empty.

If an actor declares the "Acknowledgement Support" Option, it shall be able to use Enhanced Acknowledgement Mode.

MSH-16 Application Acknowledgment Type (ID), optional.

As a minimal requirement for all actors, the Original Acknowledgement Mode shall be supported, in which case this field of the message will remain empty.

If an actor declares the "Acknowledgement Support" Option, it shall be able to use Enhanced Acknowledgement Mode.

MSH-17 Country Code (ID), required if available.

Definition: This field contains the country of origin for the message. The values to be used are those of ISO 3166, using the 3-character alphabetic form. Refer to *HL7 Table 0399 - Country code*.

Examples of valid values:

JPN = Japan, USA = United States, GBR = United Kingdom, ITA = Italy, FRA = France, NLD = Netherlands.

MSH-18 Character Set (ID), conditional.

Definition: This field contains the character set for the entire message. Refer to *HL7 Table 0211 - Alternate character sets* for valid values.

Examples of valid values:

ASCII: The printable 7-bit ASCII character set.

8859/1: The printable characters from the ISO 8859/1 Character set used by Western Europe. This character set can still be used, but 8859/15 should be used by preference. This character set

is the forward-compatible version of 8859/1 and includes new characters such as the Euro currency symbol.

ISO IR87: Code for the Japanese Graphic Character set for information interchange (JIS X 0208-
515   1990).

UNICODE UTF-8: UCS Transformation Format, 8-bit form.

Condition predicate: This field shall only be valued if the message uses a character set other than the 7-bit ASCII character set. Though the field is repeatable in HL7, IHE authorizes only one occurrence (i.e., one character set). The character set specified in this field is used for the
520   encoding of all of the characters within the message.

MSH-19 Principal Language of Message (CE), required if available. Coded from ISO 639.

Examples: DE = German, EN = English, ES=Spanish, JA = Japanese, FR = French, NL = Dutch, IT = Italian

MSH-20 Alternate Character Set Handling Scheme (ID), not supported: Character set
525   switching is not allowed here.

MSH-21 Message Profile Identifier (EI), required if available.

This field shall be valued in the messages for which a Message Profile has been officially registered with HL7, and is recommended to be valued for all messages in accordance with IHE Technical Framework transactions. See volume 2x: Appendix C.

530   **3.30.5.2 EVN – Event Type Segment**

Standard Reference: HL7 Version 2.5, Chapter 3, Section 3.4.1

This segment is used to provide generic properties of the trigger event.

Table 3.30-2: EVN – Event Type segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	3	ID	X	[0..0]	0003	00099	Event Type Code
2	26	TS	R	[1..1]		00100	Recorded Date Time
3	26	TS	C	[0..1]		00101	Date/Time Planned Event
4	3	IS	O	[0..1]	0062	00102	Event Reason Code
5	250	XCN	O	[0..*]	0188	00103	Operator ID
6	26	TS	C	[0..1]		01278	Event Occurred
7	241	HD	RE	[0..1]		01534	Event Facility

535   **EVN-1 Event Type Code (ID)**, Not supported (deprecated in HL7 2.5). The Event Type Code is given in MSH-9 of segment MSH.

EVN-2 Recorded Date Time (TS), Required. Date/time when the event was recorded.

EVN-3 Date/Time Planned Event (TS), Conditional. Date/time when the event was planned.

Condition predicate:

540
- This field shall be populated in events "Pending Transfer" (A15) and "Cancel Pending Transfer" (A26), which are supported by transaction ITI-31.

- The update of a pending transfer uses message A08 and leaves this field empty. The update of the planned date/time of the transfer is only possible through the ZBE segment in message Z99, when using the option "Historic Movement Management" of transaction
545
ITI-31.

- Other planned events of transaction ITI-31, such as "Pending Admit", "Pending Discharge" and the cancels thereof, use a specific field of segment PV2 to give the date/time of the planned event. For consistency of use, IHE recommends that the content of the specific field of PV2 be also copied to EVN-3.

550 National extensions of this transaction may extend the condition above.

EVN-6 Event Occurred (TS): Conditional. This field contains the date/time that the event really occurred.

Condition predicate:

- This field shall not be populated in messages communicating pending events and their
555
cancellations.

- In messages communicating effective events (inserts and updates), this field shall be populated with the real date/time of the notified event.

- In messages communicating cancellations, this field shall be populated with the date/time that was sent in the message that originally communicated the event being cancelled.

560 **EVN-7 Event Facility (HD)**: Required if known to the sender. This field identifies the actual facility where the event occurred as distinct from the sending facility (MSH-4).

3.30.5.3 PID - Patient Identification segment

Standard Reference: HL7 Version 2.5, Chapter 3 (Section 3.4.2)

The PID segment is used by all applications as the primary means of communicating patient
565 identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Table 3.30-3: PID - Patient Identification segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	4	SI	O	[0..1]		00104	Set ID - PID
2	20	CX	X	[0..0]		00105	Patient ID
3	250	CX	R	[1..*]		00106	Patient Identifier List
4	20	CX	X	[0..0]		00107	Alternate Patient ID - PID
5	250	XPN	R	[1..*]		00108	Patient Name

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
6	250	XPN	O (Note 1)	[0..1]		00109	Mother's Maiden Name
7	26	TS	CE (Note 1)	[0..1]		00110	Date/Time of Birth
8	1	IS	CE (Note 1)	[1..1]	0001	00111	Administrative Sex
9	250	XPN	X	[0..1]		00112	Patient Alias
10	250	CE	O	[0..1]	0005	00113	Race
11	250	XAD	CE (Note 1)	[0..*]		00114	Patient Address
12	4	IS	X	[0..1]	0289	00115	County Code
13	250	XTN	O (Note 1)	[0..*]		00116	Phone Number - Home
14	250	XTN	O	[0..*]		00117	Phone Number - Business
15	250	CE	O	[0..1]	0296	00118	Primary Language
16	250	CE	O	[0..1]	0002	00119	Marital Status
17	250	CE	O	[0..1]	0006	00120	Religion
18	250	CX	C	[0..1]		00121	Patient Account Number
19	16	ST	X	[0..1]		00122	SSN Number - Patient
20	25	DLN	X	[0..1]		00123	Driver's License Number - Patient
21	250	CX	O	[0..*]		00124	Mother's Identifier
22	250	CE	O	[0..1]	0189	00125	Ethnic Group
23	250	ST	O	[0..1]		00126	Birth Place
24	1	ID	O (Note 1)	[0..1]	0136	00127	Multiple Birth Indicator
25	2	NM	O (Note 1)	[0..1]		00128	Birth Order
26	250	CE	O	[0..1]	0171	00129	Citizenship
27	250	CE	O	[0..1]	0172	00130	Veterans Military Status
28	250	CE	X	[0..0]	0212	00739	Nationality
29	26	TS	CE	[0..1]		00740	Patient Death Date and Time
30	1	ID	C	[0..1]	0136	00741	Patient Death Indicator
31	1	ID	CE	[0..1]	0136	01535	Identity Unknown Indicator
32	20	IS	CE	[0..*]	0445	01536	Identity Reliability Code
33	26	TS	CE (Note 1)	[0..1]		01537	Last Update Date/Time
34	241	HD	O (Note 1)	[0..1]		01538	Last Update Facility
35	250	CE	CE	[0..1]	0446	01539	Species Code
36	250	CE	C	[0..1]	0447	01540	Breed Code
37	80	ST	O	[0..1]		01541	Strain

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
38	250	CE	O	[0..2]		01542	Production Class Code
39	250	CWE	O	[0..*]		01840	Tribal Citizenship

Note 1:   If the Pediatric Demographics Option is supported, this element in the table above shall be R2 for the Patient Identifier Cross-Reference Manager.

570

In accord with the HL7 Version 2.5 usage of this segment, fields PID-2 (Patient ID), PID-4 (Alternate Patient ID), PID-19 (SSN patient number) and PID-20 (Driver's license number) are superseded by field PID-3, as shown below; field PID-28 (Nationality) is superseded by field PID-26 (Citizenship).

575   **PID-3 – Patient Identifier List (CX)**, required. This field contains a list of identifiers (one or more) used by the healthcare facility to uniquely identify a patient.

As shown in the constrained profile definition of data type CX in ITI TF-2x: Appendix N.1, subfields CX-1 "ID number", CX-4 "Assigning authority" are required, and CX-5 "Identifier Type Code" is required if known for each identifier.

580   This field may be populated with various identifiers assigned to the patient by various assigning authorities.

The authorized values for subfield CX-5 "Identifier Type Code" are given in HL7 Table 0203 (HL7 Version 2.5, Chapter 2A, Section 2A.17.5).

Values commonly used for Identifier Type Code in the context of PID-3 are as follows:

585   BC   Bank card number. Assigning authority is the bank.

BR   Birth Certificate number. Assigning authority is the birth state or national government that issues the Birth Certificate.

DL   Driver's license number. Assigning authority is the state

NH   National Health Plan Identifier. Assigning authority at the national level.

590   PE   Living Subject Enterprise Number. Assigning authority is the enterprise.

PI   Patient Internal Identifier assigned by the healthcare organization.

PPN   Passport number.

PRC   Permanent Resident Card Number

SS   Social Security Number.

595

PID-5 – Patient Name (XPN), required. This field contains one or more names for the patient. At least one name must be provided, with at least the first subfield "Family Name" valued. See the constrained profile definition of data type XPN.

PID-6 – Mother's Maiden Name (XPN), conditional:

600   Condition predicate:

This field is required if known for the Pediatrics Demographic Option. It serves to help link records when other demographic data and search criteria are not exactly the same.

PID-7 – Date/Time of Birth (TS), conditional.

Condition predicate:

605   • This field is required if available (i.e., known to the sender) in the following messages: Creation of a new patient (A28 in ITI-30), inpatient admitted (A01 in ITI-31), registration of an outpatient (A04 in ITI-31), update patient demographics (A31 in ITI-30), update patient demographics in the context of an encounter (A08 in ITI-31).

   • In all other messages, it is optional.

610   • If the exact date of birth is not known, it can be truncated to the year of birth (e.g., 1954) or to the year and month of birth (e.g., 195411).

PID-8 – Administrative Sex (IS), conditional.

Condition predicate:

   • This field is required if available in the following messages: Creation of a new patient
615   (A28 in ITI-30), inpatient admitted (A01 in ITI-31), registration of an outpatient (A04 in ITI-31), update patient demographics (A31 in ITI-30).

   • In all other messages, it is optional.

The authorized values are these, taken from HL7 User-defined Table 0001:

User-defined Table 0001: Administrative Sex

Value	Description	Comment
F	Female	
M	Male	
O	Other	
U	Unknown	
A	Ambiguous	
N	Not applicable	

620

PID-10 – Race (CE), optional: The patient race is information of critical medical importance in practices such as imaging. Therefore this information shall be present if known, except where prohibited. For example, France prohibits inclusion of Patient Race.

PID-11 – Patient Address (XAD), conditional:

625   Condition predicate:

- This field is required if available (if known to the sender) in the following messages: Creation of a new patient (A28 in ITI-30), inpatient admitted (A01 in ITI-31), registration of an outpatient (A04 in ITI-31), update patient demographics (A31 in ITI-30).

- In all other messages, it is optional.

630 **PID-13 – Home Phone Number (XTN)**, conditional.

Condition predicate:

This field is required if known for the Pediatrics Demographic Option. It serves to help locate records when other demographic data and search criteria are not exactly the same.

PID-18 – Patient Account Number (CX), Conditional.

635 HL7 Definition: This field contains the patient account number assigned by accounting to which all charges, payments, etc., are recorded. It is used to identify the patient's account.

Relationship to encounter: A patient account can span more than one enterprise encounter.

Condition predicate: At least one of the fields PID-18 "Patient Account Number" or PV1-19 "Visit Number" shall be valued in the messages of transaction ITI-31 that use the PV1 segment.
640 Additional requirements for the presence of value in these fields may be documented in national extensions of this transaction.

PID-24 – Multiple Birth Indicator (ID), conditional.

Condition predicate:

This field is required if known for the Pediatrics Demographic Option. It serves to help avoid
645 linking records for twins, which are often nearly identical.

PID-25 – Birth Order (NM), conditional.

Condition predicate:

This field is required if known for the Pediatrics Demographic Option. It serves to help avoid linking records for twins, which are often nearly identical.

650 **PID-29 – Patient Death Date and Time (TS)**, conditional:

Condition predicate:

- This field is required in the Patient Discharge message of transaction ITI-31 if the encounter is terminated by the patient's death and the death date is known. It provides the date/time of the patient's death.

655 - In all other Patient Discharge messages, it shall not be populated.

PID-30 – Patient Death Indicator (ID), conditional:

Condition predicate:

- This field is required to be populated with value "Y" in the Patient Discharge message of transaction ITI-31 when the encounter is terminated by the patient's death.

660   •   Otherwise it is optional.

PID-31 – Identity Unknown Indicator (ID), conditional:

Condition predicate:

- This field is required if available (i.e., known to the sender) in the following messages:
665   Creation of a new patient (A28 in ITI-30), inpatient admitted (A01 in ITI-31), registration of an outpatient (A04 in ITI-31), update patient demographics (A31 in ITI-30), update patient demographics in the context of an encounter (A08 in ITI-31).

- In all other messages, it is optional.

The possible values are "Y", and "N" which is the default.

The value "Y" means that the patient identity is unknown. In this case the field PID-3 shall
670 contain one single patient identifier, which is a temporary identifier, and the field PID-32 will contain the value "AL" indicating that the patient name is an alias.

PID-32 – Identity Reliability Code (IS), conditional:

Condition predicate:

- This field is required if available (i.e., known to the sender) in the following messages:
675   Creation of a new patient (A28 in ITI-30), inpatient admitted (A01 in ITI-31), registration of an outpatient (A04 in ITI-31), update patient demographics (A31 in ITI-30) , update patient demographics in the context of an encounter (A08 in ITI-31).

- In all other messages, it is optional.

The field is repeatable. The possible values are taken from HL7 user-defined Table 0445:

680   **User-defined Table 0445: Identity Reliability Code**

Value	Description	Comment (added by IHE for this profile)
AL	Patient/Person Name is an Alias	Used in case of an unidentified patient (e.g., trauma case)

PID-33 – Last Update Date/Time (TS), conditional:

Condition predicate:

- This field is required if available (i.e., known to the sender) in the following messages:
685   Creation of a new patient (A28 in ITI-30), inpatient admitted (A01 in ITI-31), registration of an outpatient (A04 in ITI-31), update patient demographics (A31 in ITI-30), update patient demographics in the context of an encounter (A08 in ITI-31).

- In the cases of messages A08 and A31, the content of this field is equal to the value in EVN-6-event occurred.

690   Note: This field is required if known for the Pediatrics Demographic Option. The condition predicate above satisfies this requirement. It serves to help avoid linking records for twins, which are often nearly identical. It is used in conjunction with PID-34.

PID-34 – Last Update Facility (HD), conditional.

Condition predicate:

695   This field is required if known for the Pediatrics Demographic Option. It serves to help avoid linking records for twins, whose records are often nearly identical, when used in conjunction with PID-33.

PID-35 – Species Code (CE) and **PID-36 – Breed Code (CE)**, conditional:

Condition predicate:

700   •   Required if known to the sender, when the patient is a non-human living subject, in the following messages: Creation of a new patient (A28 in ITI-30), inpatient admitted (A01 in ITI-31), registration of an outpatient (A04 in ITI-31), update patient demographics (A31 in ITI-30), update patient demographics in the context of an encounter (A08 in ITI-31).

705   **3.30.5.4 PV1 - Patient Visit segment**

Standard Reference: HL7 Version 2.5, Chapter 3 (Section 3.4.3)

The PV1 segment is used by Registration/Patient Administration applications to communicate information on an account or visit-specific basis.

Table 3.30-4: PV1 - Patient Visit segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O	[0..1]		00131	Set ID - PV1
2	1	IS	R	[1..1]	0004	00132	Patient Class
3	80	PL	C	[0..1]		00133	Assigned Patient Location
4	2	IS	O	[0..1]	0007	00134	Admission Type
5	250	CX	O	[0..1]		00135	Preadmit Number
6	80	PL	C	[0..1]		00136	Prior Patient Location
7	250	XCN	O	[0..*]	0010	00137	Attending Doctor
8	250	XCN	O	[0..*]	0010	00138	Referring Doctor
9	250	XCN	X	[0..0]	0010	00139	Consulting Doctor
10	3	IS	O	[0..1]	0069	00140	Hospital Service
11	80	PL	C	[0..1]		00141	Temporary Location
12	2	IS	O	[0..1]	0087	00142	Preadmit Test Indicator
13	2	IS	O	[0..1]	0092	00143	Re-admission Indicator
14	6	IS	O	[0..1]	0023	00144	Admit Supplier
15	2	IS	O	[0..*]	0009	00145	Ambulatory Status
16	2	IS	O	[0..1]	0099	00146	VIP Indicator
17	250	XC	O	[0..*]	0010	00147	Admitting Doctor

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	ELEMENT NAME
		N					
18	2	IS	O	[0..1]	0018	00148	Patient Type
19	250	CX	C	[0..1]		00149	Visit Number
20	50	FC	O	[0..*]	0064	00150	Financial Class
21	2	IS	O	[0..1]	0032	00151	Charge Price Indicator
22	2	IS	O	[0..1]	0045	00152	Courtesy Code
23	2	IS	O	[0..1]	0046	00153	Credit Rating
24	2	IS	O	[0..*]	0044	00154	Contract Code
25	8	DT	O	[0..*]		00155	Contract Effective Date
26	12	NM	O	[0..*]		00156	Contract Amount
27	3	NM	O	[0..*]		00157	Contract Period
28	2	IS	O	[0..1]	0073	00158	Interest Code
29	4	IS	O	[0..1]	0110	00159	Transfer to Bad Debt Code
30	8	DT	O	[0..1]		00160	Transfer to Bad Debt Date
31	10	IS	O	[0..1]	0021	00161	Bad Debt Agency Code
32	12	NM	O	[0..1]		00162	Bad Debt Transfer Amount
33	12	NM	O	[0..1]		00163	Bad Debt Recovery Amount
34	1	IS	O	[0..1]	0111	00164	Delete Account Indicator
35	8	DT	O	[0..1]		00165	Delete Account Date
36	3	IS	O	[0..1]	0112	00166	Discharge Disposition
37	47	DLD	O	[0..1]	0113	00167	Discharged to Location
38	250	CE	O	[0..1]	0114	00168	Diet Type
39	2	IS	O	[0..1]	0115	00169	Servicing Facility
40	1	IS	X	[0..1]	0116	00170	Bed Status
41	2	IS	O	[0..1]	0117	00171	Account Status
42	80	PL	C	[0..1]		00172	Pending Location
43	80	PL	O	[0..1]		00173	Prior Temporary Location
44	26	TS	RE	[0..1]		00174	Admit Date/Time
45	26	TS	RE	[0..1]		00175	Discharge Date/Time
46	12	NM	O	[0..1]		00176	Current Patient Balance
47	12	NM	O	[0..1]		00177	Total Charges
48	12	NM	O	[0..1]		00178	Total Adjustments
49	12	NM	O	[0..1]		00179	Total Payments
50	250	CX	O	[0..1]	0203	00180	Alternate Visit ID
51	1	IS	C	[0..1]	0326	01226	Visit Indicator
52	250	XCN	X	[0..*]	0010	01274	Other Healthcare Provider

710   **General conditions of use**:

- All messages of transaction ITI-30 that use this segment, actually use a pseudo-PV1, which is empty. The only field populated is PV1-2 "Patient Class" values "N" (Not Applicable).

715

- The condition predicates described below only apply to the use of this segment in the context of transaction ITI-31.

PV1-2 – Patient Class (IS), required:

Definition: This field is used by systems to categorize patients by site. It does not have a consistent industry-wide definition. It is subject to site-specific variations. Refer to *User-defined Table 0004 - Patient Class* for suggested values.

720   <div align="center">

User-defined Table 0004: Patient Class
</div>

Value	Description	Comment
E	Emergency	
I	Inpatient	
O	Outpatient	
P	Preadmit	
R	Recurring patient	
B	Obstetrics	
C	Commercial Account	
N	Not Applicable	
U	Unknown	

National extensions of the PAM Profile may add further values to this table.

Messages of transaction ITI-31 may use any of the above values. The four first values ("E" Emergency, "I" Inpatient, "O" Outpatient, "P" Preadmit) are in common use in most countries.

725   **Conditions of use**:

- Transaction ITI-30 uses only the value "N" (Not Applicable) in all messages that contain the PV1 segment.

- In transaction ITI-31

  - Change to inpatient (A06) uses value I or another value representing an inpatient.

730

  - Change to outpatient (A07) uses value O or another value representing an outpatient (i.e., not assigned to an inpatient bed).

PV1-3 – Assigned Patient Location (PL), conditional:

Condition predicate:

- This field is required in the Transfer (A02) and Cancel Transfer (A12) messages.

735   •   In all other messages of transaction ITI-31, it is required if known to the sender.

PV1-6 – Prior Patient Location (PL), conditional:

Condition predicate:

- This field is required in the Transfer (A02)
- In all other messages of transaction ITI-31, it is optional.

740   **PV1-7 – Attending Doctor (XCN)**, optional. It is recommended that when this field is populated, the segment PV1/PV2 be followed by a ROL segment containing the details on the role assumed by the attending doctor.

PV1-8 – Referring Doctor (XCN), optional. It is recommended that when this field is populated, the segment PV1/PV2 be followed by a ROL segment containing the details on the
745   role assumed by the referring doctor.

PV1-9 – Consulting Doctor (XCN), not supported (deprecated by HL7). The consulting doctor(s) are entirely described in the appropriate ROL segments following the PV1/PV2.

PV1-11 – Temporary Location (PL), conditional:

Condition predicate: This field is used by the option "Temporary Patient Transfers Tracking" of
750   transaction ITI-31 (messages A09, A10, A32, A33).

PV1-19 – Visit Number (CX), Conditional. This fields contains the unique identifier assigned to the encounter.

Condition predicate: At least one of the fields PID-18 "Patient Account Number" or PV1-19 "Visit Number" shall be valued in the messages of transaction ITI-31 that use the PV1 segment.
755   Additional requirements for the presence of values in these fields may be documented in national extensions of this transaction.

PV1-42 – Pending Location (PL), conditional.

Condition predicate:

- This field is required in the Pending Transfer (A15) and Cancel Pending Transfer (A26)
760   messages.
- In all other messages of transaction ITI-31, it is optional.

PV1-44 – Admit Date / Time (TS), required if available. This field contains the date/time of the beginning of the encounter.

PV1-45 – Discharge Date / Time (TS), required if available. This field contains the date/time of
765   the discharge (end of the encounter).

PV1-51 – Visit Indicator (IS), Conditional.

This field specifies the level on which data are being sent. It is the indicator used to send data at two levels, visit and account. HL7 recommends sending an 'A' or no value when the data in the

message are at the account level, or 'V' to indicate that the data sent in the message are at the visit level.

Condition predicate: This field SHALL be valued with value "V" if the field PV1-19 "Visit Number" is present. The field MAY be omitted otherwise.

3.30.5.5 MRG – Merge segment

Standard Reference: HL7 Version 2.5, Chapter 3 (Section 3.4.9)

This segment contains the supplier patient identifiers list to be merged.

Table 3.30-5: MRG - Merge segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	250	CX	R	[1..*]		00211	Prior Patient Identifier List
2	250	CX	X	[0..0]		00212	Prior Alternate Patient ID
3	250	CX	O	[0..1]		00213	Prior Patient Account Number
4	250	CX	X	[0..0]		00214	Prior Patient ID
5	250	CX	X	[0..0]		01279	Prior Visit Number
6	250	CX	X	[0..0]		01280	Prior Alternate Visit ID
7	250	XPN	O	[0..*]		01281	Prior Patient Name

Each of the patient identifiers appearing in the MRG-1 is to be merged with a target patient identifier of the same type in the PID-3.

The type of identifier is a code given by the 5th component of the CX data type. See the commonly used identifier types in the description of the PID segment above. See also the definition of data type CX in the "Common Data Types" section.

3.30.5.6 ROL – Role segment

Standard Reference: HL7 Version 2.5, Chapter 15 (Section 15.4.7)

The ROL segment communicates information on persons related to the patient.

Table 3.30-6: ROL Segment

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM #	ELEMENT NAME
1	60	EI	C	[0..1]		01206	Role Instance ID
2	2	ID	R	[1..1]	0287	00816	Action Code
3	250	CE	R	[1..1]	0443	01197	Role-ROL
4	250	XCN	R	[1..*]		01198	Role Person
5	26	TS	O	[0..1]		01199	Role Begin Date/Time
6	26	TS	O	[0..1]		01200	Role End Date/Time

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM #	ELEMENT NAME
7	250	CE	O	[0..1]		01201	Role Duration
8	250	CE	O	[0..1]		01205	Role Action Reason
9	250	CE	O	[0..*]		01510	Provider Type
10	250	CE	O	[0..1]	0406	01461	Organization Unit Type
11	250	XAD	O	[0..*]		00679	Office/Home Address/Birthplace
12	250	XTN	O	[0..*]		00678	Phone

ROL-1 – Role Instance ID (EI), optional. This field is in fact optional in the context of ADT messages.

790 **ROL-2 – Action Code (ID)**, required

ROL-3 – Role-ROL (CE), required. This field defines the functional involvement of the person. Values are given in *User-defined Table 0443*:

User-defined Table 0443: Provider role

Value	Description	Used with
AD	Admitting	PV1-17 Admitting doctor
AT	Attending	PV1-7 Attending doctor
CP	Consulting Provider	
FHCP	Family Health Care Professional	
PP	Primary Care Provider	
RP	Referring Provider	PV1-8 Referring doctor
RT	Referred to Provider	

795 **ROL-4 – Role Person (XCN)**, required. Identification of the person playing the role.

3.30.5.7 OBX – Observation/Result segment

Standard Reference: HL7 Version 2.5, Chapter 7 (Section 7.4.2)

In transactions ITI-30 and ITI-31, the OBX segment is primarily used to convey patient height and patient weight. For this reason, this segment is described in this section, although it always
800 appears as optional in transactions ITI-30 and ITI-31.

Table 3.30-7: OBX Segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	4	SI	O	[0..1]		00569	Set ID – OBX
2	2	ID	C	[1..1]	0125	00570	Value Type

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
3	250	CE	R	[1..1]		00571	Observation Identifier
4	20	ST	C	[0..1]		00572	Observation Sub-ID
5	99999	Varies	C	[1..1]		00573	Observation Value
6	250	CE	O	[0..1]		00574	Units
7	60	ST	O	[0..1]		00575	References Range
8	5	IS	O	[0..1]	0078	00576	Abnormal Flags
9	5	NM	O	[0..1]		00577	Probability
10	2	ID	O	[0..1]	0080	00578	Nature of Abnormal Test
11	1	ID	R	[0..1]	0085	00579	Observation Result Status
12	26	TS	O	[0..1]		00580	Effective Date of Reference Range
13	20	ST	O	[0..1]		00581	User Defined Access Checks
14	26	TS	O	[0..1]		00582	Date/Time of the Observation
15	250	CE	O	[0..1]		00583	Producer's ID
16	250	XCN	O	[0..1]		00584	Responsible Observer
17	250	CE	O	[0..1]		00936	Observation Method
18	22	EI	O	[0..1]		01479	Equipment Instance Identifier
19	26	TS	O	[0..1]		01480	Date/Time of the Analysis

OBX-2 Value Type (ID), conditional.

This field contains the type of observation.

805   Example: "NM" for a numeric observation such as patient weight or patient height.

Condition predicate: This field SHALL be valued if OBX-5 "Observation Value" is present. It MAY be valued otherwise.

OBX-3 Observation Identifier (CE), required

The usage of LOINC vocabulary is strongly recommended. Details of this free vocabulary can be
810   found at http://www.loinc.org. The first and third sub-fields, "Identifier" and "Name of Coding System" are required in all transactions. The value of the "Name of Coding System" in the case of LOINC is "LN". Example of the code used with the patient weight:

```
3142-7^BODY WEIGHT (STATED)^LN
```

815

OBX-4 Observation Sub-ID (CE), conditional

This field is used to distinguish between multiple OBX segments with the same observation ID.

Condition predicate: When field OBX-3 "Observation Identifier" has an identical value in two or more OBX segments of the message, field OBX-4 "Observation Sub-ID" SHALL be populated
820   with a distinct value in each of these OBX segments.

OBX-5 Observation Value (Varies), conditional.

This field contains the value of the observation itself.

Condition predicate: This field SHALL be valued if OBX-11 "Observation Result Status" has another value than "X", "D", "N" or "I" and if OBX-8 "Abnormal Flags" is empty. In all other cases this field MAY be valued.

OBX-11 Observation Result Status (ID), required.

This field contains the status of the results. In messages of transactions ITI-30 and ITI-31, this status is most commonly "F" (Final).

Example of use of the OBX segment to carry the patient weight and height:

```
OBX|1|NM|3142-7^BODY WEIGHT (STATED)^LN||62|kg|||||F
OBX|2|NM|8303-0^BODY HEIGHT^LN||1.70|m|||||F
```

3.30.5.8 AL1 – Patient Allergy Information segment

Standard Reference: HL7 Version 2.5, Chapter 3, Section 3.4.6

In transactions ITI-30 and ITI-31, the AL1 segment is used to inform the receiver of patient allergies. For this reason, this segment is described in this section, although it always appears as optional in transactions ITI-30 and ITI-31.

Table 3.30-8: AL1 Segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	4	SI	R	[1..1]		00203	Set ID – AL1
2	250	CE	O	[0..1]	0127	00204	Allergen Type Code
3	250	CE	R	[1..1]		00205	Allergen Code/Mnemonic/Description
4	250	CE	O	[0..1]	0128	00206	Allergen Severity Code
5	15	ST	O	[0..*]		00207	Allergen Reaction Code
6	8	DT	X	[0..0]		00208	Identification Date

One or more AL1 segments may appear in the messages of transactions ITI-30 and ITI-31 if any allergies have been identified for the patient at time of registration.

3.30.6 Interactions

All messages of this transaction shall be acknowledged by the ACK message as stated in ITI TF-2x: Appendix C. For better readability, the acknowledgement messages are not shown on the interaction diagrams of this transaction.

3.30.6.1 Interaction diagram
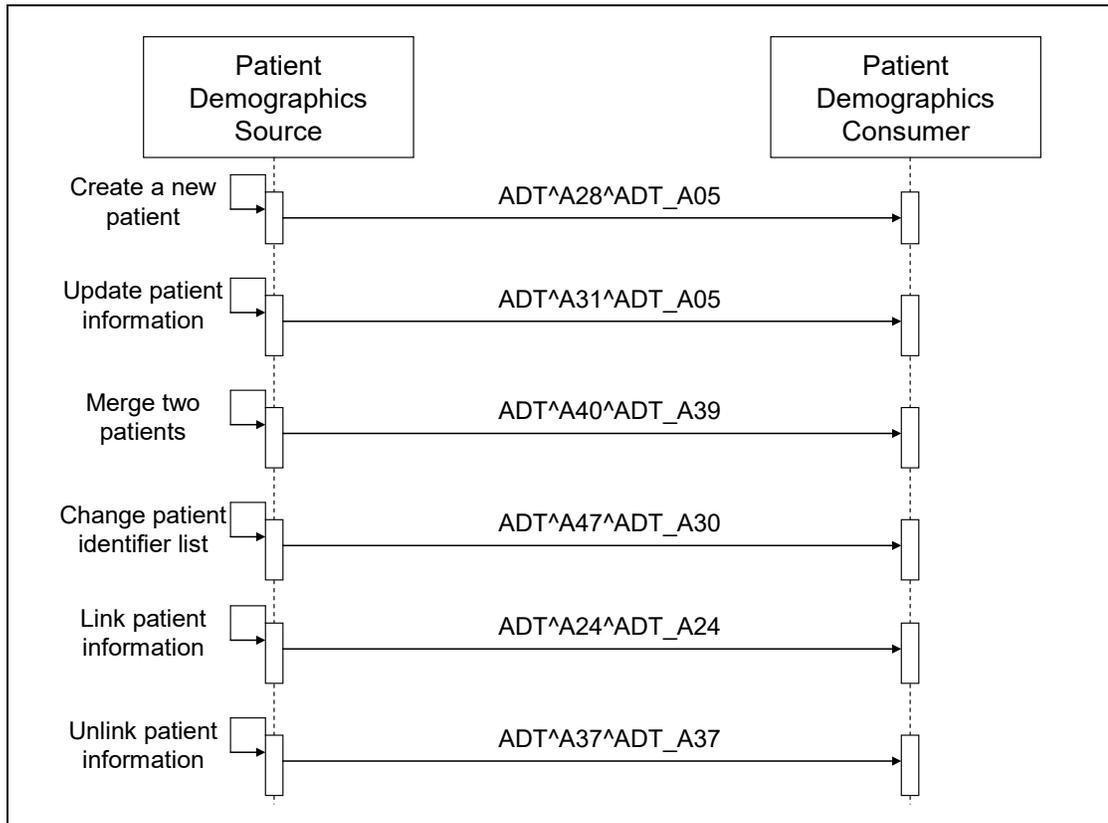
Figure 3.30-1: Interactions of Transaction ITI-30

3.30.6.2 Create New Patient - ADT^A28^ADT_A05

850 **3.30.6.2.1 Trigger Event**

This message is sent by a Patient Demographics Supplier to a Patient Demographics Consumer to communicate the demographics of a new patient, as well as related information.

MSH-9 is valued **ADT^A28^ADT_A05**.

3.30.6.2.2 Message Static Definition

855 **Table 3.30-9: Static definition of ADT^A28^ADT_A05**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3

Segment	Meaning	Usage	Card.	HL7 chapter
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	X	[0..0]	3
ROL	Role	X	[0..0]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6

3.30.6.2.3   Comments on segment usage

The ROL segment following the PID/PD1 segments is used to communicate "person level" providers having an ongoing relationship with the patient, such as "family health care provider" and "primary care provider".

860 The PV1 segment in this message is required in the HL7 message structure, but it is a pseudo PV1 carrying the only required field PV1-2 "Patient Class" with the value "N" meaning "Not applicable". This message does not convey any visit information.

The PV2 segment is not supported here, for the same reason.

The ROL segment following the PV1/PV2 segments is not supported here, for the same reason.

865 One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

The ROL segment following the IN1/IN2/IN3 segments serves to communicate providers related to a specific insurance carrier.

3.30.6.2.4   Expected actions

870   The receiver shall add this new patient to its database, and shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

3.30.6.3 Update patient information - ADT^A31^ADT_A05

3.30.6.3.1   Trigger Event

This message is sent by a Patient Demographics Supplier to a Patient Demographics Consumer
875   to update the demographics of an existing patient.

MSH-9 is valued **ADT^A31^ADT_A05**.

3.30.6.3.2   Message Static Definition

Table 3.30-10: Static definition of ADT^A31^ADT_A05

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	X	[0..0]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			

Segment	Meaning	Usage	Card.	HL7 chapter
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6

3.30.6.3.3   Comments on segment usage

880   To accommodate the situation in which the receiver does not know the patient, this message is populated with complete up-to-date demographics for the patient.

The ROL segment following the PID/PD1 segments is used to communicate "person level" providers having an ongoing relationship with the patient, such as "family health care provider" and "primary care provider".

885   The PV1 segment in this message is required in the HL7 message structure, but it is a pseudo PV1 carrying the only required field PV1-2 "Patient Class" with the value "N" meaning "Not applicable". This message does not convey any visit information.

The PV2 segment is not supported here, for the same reason.

The ROL segment following the PV1/PV2 segments is not supported here, for the same reason.

890   One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

The ROL segment following the IN1/IN2/IN3 segments serves to communicate providers related to a specific insurance carrier.

3.30.6.3.4   Expected actions

895   The receiver shall update the patient record in its database, and shall report the result of this operation (success / error) in an acknowledgment message returned to the sender. If the receiver did not previously have a record for this patient, it shall insert this patient into its database.

3.30.6.4 Merge two patients - ADT^A40^ADT_A39

This message is to be supported with the "Merge" Option of transaction ITI-30.

900   ### 3.30.6.4.1   Trigger Event

The Patient Demographics Supplier notifies to a Patient Demographics Consumer, the merge of records for a patient that was incorrectly filed under two different identifiers. This message is only used to merge two patient identifiers of the same type, or two lists of patient identifiers. It is not used to update other patient demographics information. The A31 trigger event should be used

905   for this purpose.

MSH-9 is valued **ADT^A40^ADT_A39**.

3.30.6.4.2   Message Static Definition

Table 3.30-11: Static definition of ADT^A40^ADT_A39

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
---	--- PATIENT begin	R	[1..1]	
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
MRG	Merge Information	R	[1..1]	3
PV1	Patient Visit	X	[0..0]	3

3.30.6.4.3 Comments on segment usage

This transaction makes unrepeatable the PATIENT segment group: The message can communicate only one merge operation for one patient.

The "incorrect supplier identifier" identified in the MRG segment (*MRG-1 - Prior Patient Identifier List*) is to be merged with the required "correct target identifier" of the same "identifier type code" component identified in the PID segment (*PID-3 - Patient Identifier List*). The "incorrect supplier identifier" would then logically never be referenced in future transactions.

The PV1 segment is not supported by IHE in this message.

3.30.6.4.4 Expected actions

The receiver shall merge the two patients in its database, and shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

If the receiver does not recognize the target patient identifiers, it shall perform a Change Patient Identifier List instead of a Merge. This situation is not an error.

If the receiver does not recognize the supplier patient identifiers to be merged, it shall take no action. This situation is not an error.

If the receiver does not support the Merge Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.30.6.5 Change Patient Identifier List - ADT^A47^ADT_A30

3.30.6.5.1 Trigger Event

The Patient Demographics Supplier notifies the change of a patient identifier list for a patient. That is, a single *PID-3-patient identifier list value* has been found to be incorrect and has been changed.

This message is not used to update other patient demographics information. The A31 trigger event should be used for this purpose.

MSH-9 is valued **ADT^A47^ADT_A30**.

3.30.6.5.2   Message Static Definition

Table 3.30-12: Static definition of ADT^A47^ADT_A30

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
---	--- PATIENT begin	R	[1..1]	
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
MRG	Merge Information	R	[1..1]	3

3.30.6.5.3   Comments on segment usage

The "incorrect supplier identifier" value is stored in the MRG segment (*MRG-1-Prior Patient Identifier List*) and is to be changed to the "correct target patient ID" value stored in the PID segment (*PID-3–Patient Identifier List*).

3.30.6.5.4   Expected actions

The receiver shall correct the identifier in its database, and shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

If the receiver already associates the target patient identifiers with another patient in its database, this is an error condition: A merge (A40) should have been sent instead of a change.

If the receiver does not recognize the supplier patient identifiers to be merged, no further action is required and no error condition exists.

3.30.6.6 Link Patient Information List - ADT^A24^ADT_A24

This message is to be supported with the "Link/Unlink" Option of transaction ITI-30.

3.30.6.6.1   Trigger Event

The Patient Demographics Supplier notifies the link of one patient identifier list (the first PID segment) to another one (the second PID segment). Linking two or more patients does not require the actual merging of patient information; following a link event, the affected patient data records should remain distinct.

This message is not used to update other patient demographics information. The A31 trigger event should be used for that purpose.

MSH-9 is valued to **ADT^A24^ADT_A24**.

3.30.6.6.2   Message Static Definition

Table 3.30-13: Static definition of ADT^A24^ADT_A24

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	X	[0..1]	3
PV1	Patient Visit	X	[0..1]	3
DB1	Disability Information	X	[0..1]	3
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	X	[0..1]	3
PV1	Patient Visit	X	[0..1]	3
DB1	Disability Information	X	[0..1]	3

3.30.6.6.3   Comments on segment usage

The patient identifier list stored in the first PID segment (*PID-3–Patient Identifier List*) is to be linked with the patient identifier list stored in the second PID segment (*PID-3–Patient Identifier List*).

Transaction ITI-30 restricts the use of this message to only the purpose of linking two patient identifier lists. This is why segments PD1, PV1 and DB1 are not supported in this message.

3.30.6.6.4   Expected actions

The receiver links the identifier lists in its database, and reports the result of this operation (success / error) in an acknowledgment message returned to the sender. In case of success, each patient record persists with all its associated information (encounter, clinical, care, insurance, next of kin, etc.).

In case the receiver did not recognize one or both of the patient identifier lists, the linking is still performed (the receiver will record the link without creating any missing patient record) and no error condition exists.

If the receiver does not support the Link/Unlink Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.30.6.7 Unlink Patient Information List - ADT^A37^ADT_A37

3.30.6.7.1   Trigger Event

The Patient Demographics Supplier notifies the receiving system of the unlinking of one patient identifier list (the first PID segment) from another one (the second PID segment).

MSH-9 is valued **ADT^A37^ADT_A37**.

3.30.6.7.2   Message Static Definition

Table 3.30-14: Static definition of ADT^A37^ADT_A37

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	X	[0..1]	3
PV1	Patient Visit	X	[0..1]	3
DB1	Disability Information	X	[0..1]	3
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	X	[0..1]	3
PV1	Patient Visit	X	[0..1]	3
DB1	Disability Information	X	[0..1]	3

3.30.6.7.3   Comments on segment usage

The patient identifier lists stored in the two PID segments (*PID-3–Patient Identifier List*) are to be unlinked.

Transaction ITI-30 restricts the use of this message to only the purpose of unlinking two patient identifier lists. This is why segments PD1, PV1 and DB1 are not supported in this message.

3.30.6.7.4   Expected actions

The receiver unlinks the identifier lists in its database, and reports the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case of success the two patient records are unlinked, each of them keeping its own related information (encounter, clinical, next of kin, insurance…).

In case the receiver did not recognize the link between these two patient identifier lists, no action is performed and no error condition exists.

If the receiver does not support the Link/Unlink Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31 Patient Encounter Management [ITI-31]

This section corresponds to transaction ITI-31 "Patient Encounter Management" of the IHE IT Infrastructure Technical Framework. Transaction ITI-31 is used by the actors Patient Encounter Supplier and Patient Encounter Consumer.

3.31.1 Scope

This transaction enables systems to share encounter information within acute care settings for both inpatients (i.e., those who are assigned an inpatient bed at the facility) and outpatients (i.e., those who are not assigned an inpatient bed at the facility).

The transaction carries events for creating, updating, and canceling patient encounters as well as the movements that take place within these encounters.

The capabilities of this transaction are organized into several optional subsets to address a wide range of needs from the simplest one that only shares the basic encounter information to the most sophisticated one that tracks all patient temporary moves in the healthcare facility.

3.31.2 Use Case Roles
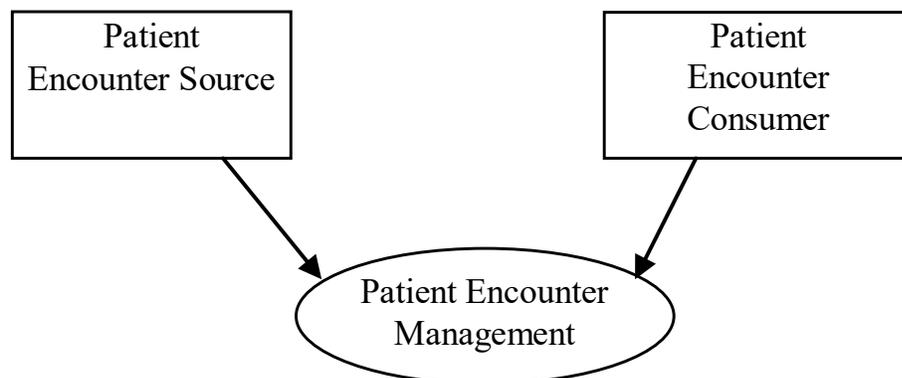
Actor: Patient Encounter Supplier

Role: Sends inserts, cancels and updates of patient encounters and movements.

Actor: Patient Encounter Consumer

Role: Receives patient encounters and movement messages, and takes the appropriate actions.

3.31.3 Referenced Standards

HL7 2.5 Chapters 2, 3, 6, 15

3.31.4 Definition of the concept "Movement"

As stated in Volume 1, a "Movement" is any change of the situation of the patient (location, patient class, attending doctor, etc.) in the context of the encounter.

The concept of "Movement" is a superset of the concept of "Transfer". Like a transfer, a movement is an event that can be planned (pending) and executed (effective). Errors detected in the recording of these pending and effective events can later be corrected through cancellations or updates, which are distinct events. Three actions are associated with Movements:

- **Insert**: This action is the first recording of the Movement.

- **Update**: This action corrects some attributes of a Movement formerly inserted. This action is possible only with the option "Historic Movement Management" of transaction ITI-30.

- **Cancel**: This action cancels a Movement that was erroneously recorded, and requests the receiver to delete this Movement from its database. Only the current Movement can be cancelled.

In some acute care settings, both the billing process and care provision process require precise knowledge of the movements of the inpatient during his or her stay in the hospital. Applications acting as Patient Encounter Supplier or Patient Encounter Consumer, divide the period of the encounter into "sub-encounters" delimited by the Movements. Each of these "sub-encounters" provides a specific context to record and invoice the acts produced within this period. However, if applications on both ends manage sub-encounters, which are periods of time, the messages of transaction ITI-31 communicate Movements as events. Hence, applications manage periods of time, but the messages carry the discrete events that delimit these periods of time.

Illustration:

1. Patient received at Emergency room by attending doctor U. (A04 / patient class E).

2. Doctor U admits the patient (A06 / patient class = I), into location BB, referring him to attending Doctor X.

3. The patient is moved to location GG (A02Transfer), keeping X for attending doctor.

4. The patient is healed and leaves the hospital (A03: Discharge).

These 4 real world events are expressed with 5 trigger events / messages, two of which occur at the same time (step 2). Here the encounter will be divided into 3 sub-encounters:
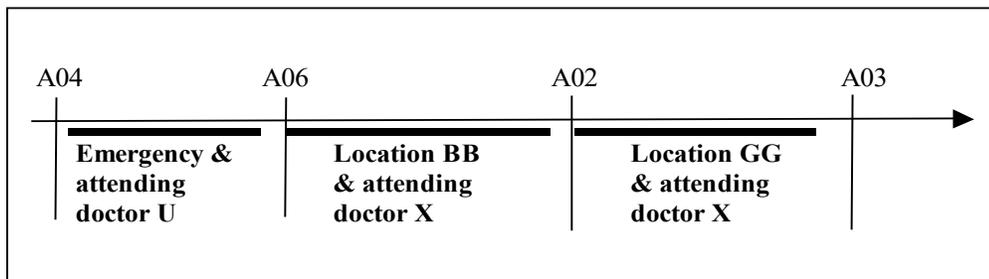
3.31.5 Message sets and options

All messages of this transaction shall be acknowledged by the ACK message as described in ITI TF-2x: Appendix C. For better readability, the acknowledgement messages are not shown on the interaction diagrams of this transaction.

3.31.5.1 Basic Subset

Table 3.31-1: Message Basic Subset for Transaction ITI-31

Category of event	Trigger / Action			
	insert		cancel	
Admit inpatient	A01	ADT^A01^ADT_A01	A11	ADT^A11^ADT_A09
Register outpatient	A04	ADT^A04^ADT_A01		
Discharge patient	A03	ADT^A03^ADT_A03	A13	ADT^A13^ADT_A01

The Basic Subset of transaction ITI-31 is composed of the above events and related messages. A system implementing either Patient Encounter Supplier or Patient Encounter Consumer, shall support these 5 trigger events and messages.
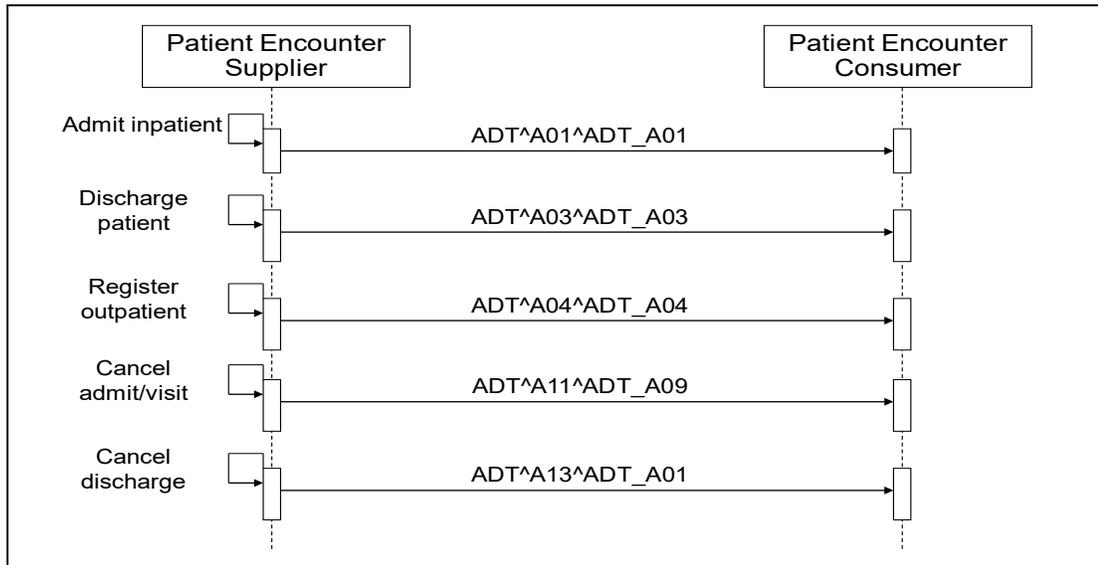
Figure 3.31-1: Interaction Diagram for the Basic Subset

3.31.5.2 Inpatient/Outpatient Encounter Management Option

This option adds support for management of patient class (Outpatient, Emergency, Inpatient, Pre-admitted, etc.) and of patient location (point of care, room, bed, etc.).

The following is the required message set to support the "Inpatient/Outpatient Encounter Management" Option:

1070   **Table 3.31-2: Message Subset for Inpatient/outpatient Encounter Management Option**

Category of event	Trigger / Action			
	insert		cancel	
Admit inpatient	A01	ADT^A01^ADT_A01	A11	ADT^A11^ADT_A09
Register outpatient	A04	ADT^A04^ADT_A01		
Discharge patient	A03	ADT^A03^ADT_A03	A13	ADT^A13^ADT_A01
Pre-admit patient	A05	ADT^A05^ADT_A05	A38	ADT^A38^ADT_A38
Change patient class to inpatient	A06	ADT^A06^ADT_A06		
Change patient class to outpatient	A07	ADT^A07^ADT_A06		
Transfer patient	A02	ADT^A02^ADT_A02	A12	ADT^A12^ADT_A12

A system implementing this option shall support these 11 trigger events and messages.

Figure 3.31-2 depicts the messages added by this option to the basic subset.
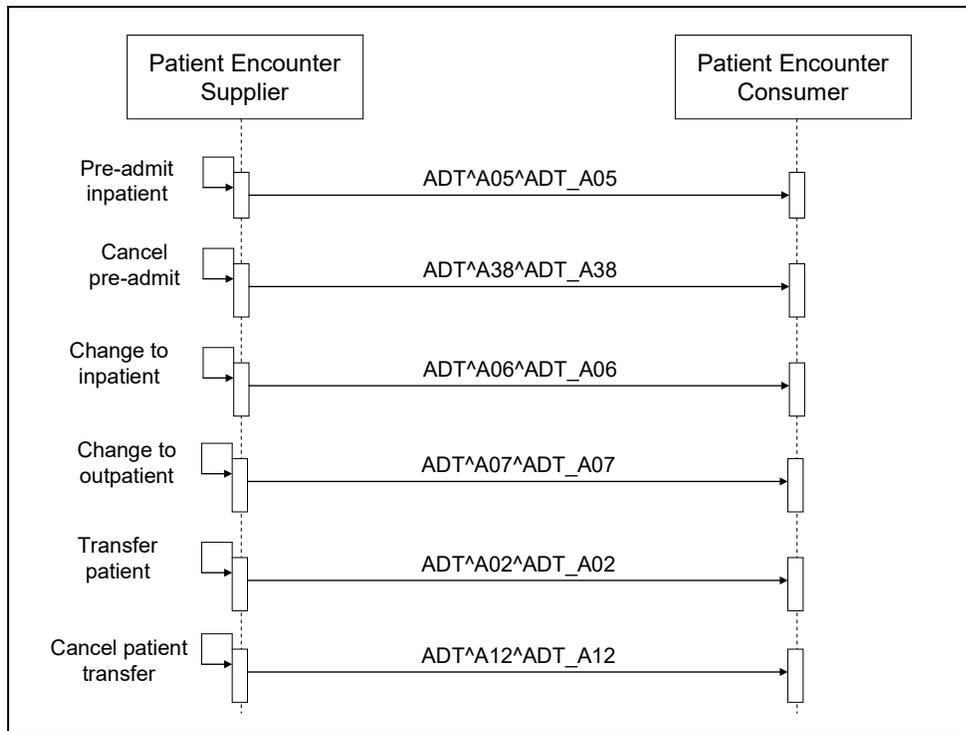
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Figure 3.31-2: Additional Interactions for "Inpatient/Outpatient Encounter Management" Option

3.31.5.3 Pending Event Management Option

This option adds support for management of pending events. This option also requires the
"Inpatient/Outpatient Encounter Management" Option.

The following is the required message set to support the "Pending Event Management" Option:

Table 3.31-3: Message Subset for Pending Event Management Option

Category of event	Trigger / Action			
	insert		cancel	
Admit inpatient	A01	ADT^A01^ADT_A01	A11	ADT^A11^ADT_A09
Register outpatient	A04	ADT^A04^ADT_A01		
Discharge patient	A03	ADT^A03^ADT_A03	A13	ADT^A13^ADT_A01
Pre-admit patient	A05	ADT^A05^ADT_A05	A38	ADT^A38^ADT_A38
Change patient class to inpatient	A06	ADT^A06^ADT_A06		
Change patient class to outpatient	A07	ADT^A07^ADT_A06		
Transfer patient	A02	ADT^A02^ADT_A02	A12	ADT^A12^ADT_A12
Pending admit	A14	ADT^A14^ADT_A05	A27	ADT^A27^ADT_A21
Pending transfer	A15	ADT^A15^ADT_A15	A26	ADT^A26^ADT_A21
Pending discharge	A16	ADT^A16^ADT_A16	A25	ADT^A25^ADT_A21

A system implementing this option shall support these 17 trigger events and messages.

Figure 3.31-3 below depicts the messages added by this option to the basic subset and the
Inpatient/Outpatient Encounter Management Option.

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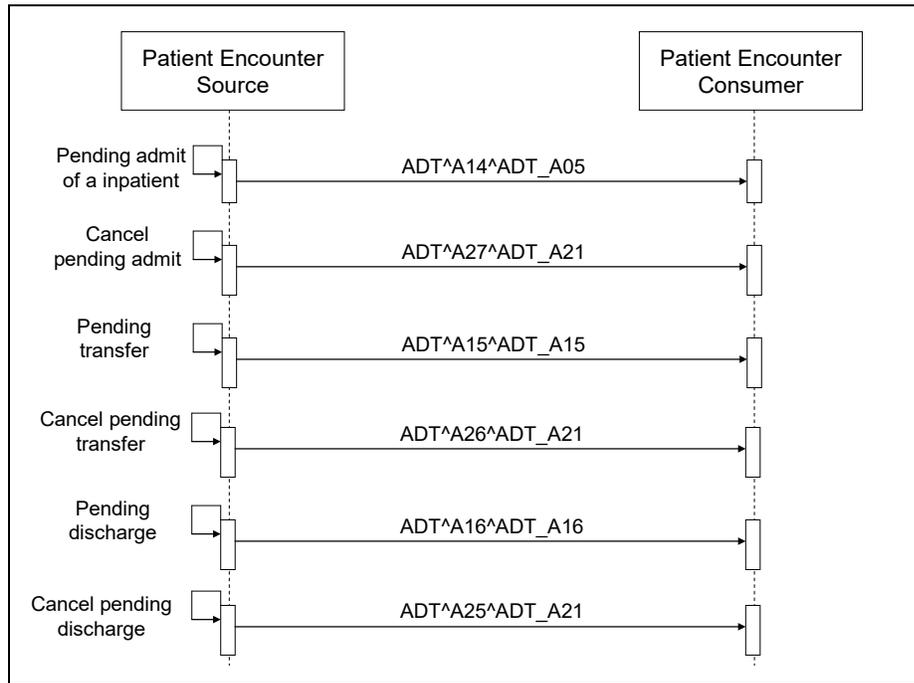
Figure 3.31-3: Additional Interactions for "Pending Event Management" Option

3.31.5.4 Advanced Encounter Management Option

This option provides support to manage changes of attending doctor, leaves of absence, and
1105   accounts.

The following is the required message set to support the "Advanced Encounter Management"
Option:

Table 3.31-4: Message Subset for Advanced Encounter Management Option

Category of event	Trigger / Action			
	insert		cancel	
Admit inpatient	A01	ADT^A01^ADT_A01	A11	ADT^A11^ADT_A09
Register outpatient	A04	ADT^A04^ADT_A01		
Discharge patient	A03	ADT^A03^ADT_A03	A13	ADT^A13^ADT_A01
Change attending doctor	A54	ADT^A54^ADT_A54	A55	ADT^A55^ADT_A52
Leave of absence	A21	ADT^A21^ADT_A21	A52	ADT^A52^ADT_A52
Return from leave of absence	A22	ADT^A22^ADT_A21	A53	ADT^A53^ADT_A52
Move account information	A44	ADT^A44^ADT_A43		

1110   A system implementing this option shall support these 12 trigger events and messages.

Figure 3.31-4 below depicts the messages added by this option to the basic subset.
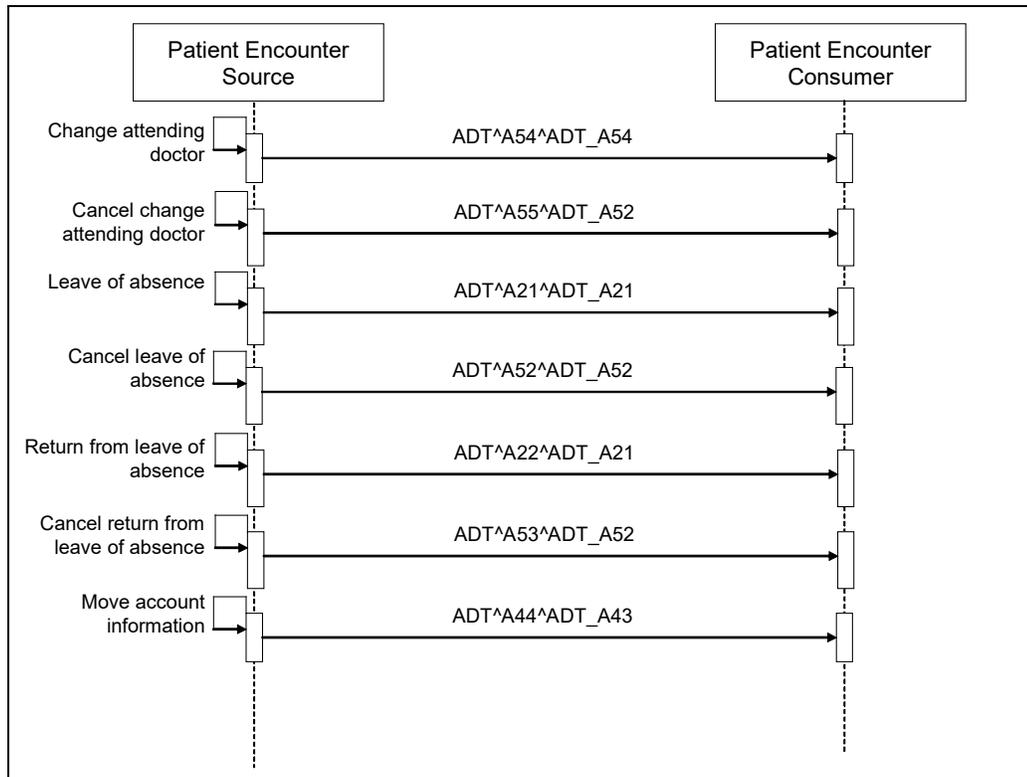
Figure 3.31-4: Additional Interactions for "Advanced Encounter Management" Option

1115 **3.31.5.5 Temporary Patient Transfers Tracking Option**

This option tracks patient moves to and from temporary locations such as radiotherapy, scanner, EKG, and dialysis.

The following is the required message set to support the "Temporary Patient Transfers Tracking" Option:

1120 **Table 3.31-5: Message Subset for Temporary Patient Transfers Tracking Option**

Category of event	Trigger / Action			
	insert		cancel	
Admit inpatient	A01	ADT^A01^ADT_A01	A11	ADT^A11^ADT_A09
Register outpatient	A04	ADT^A04^ADT_A01		
Discharge patient	A03	ADT^A03^ADT_A03	A13	ADT^A13^ADT_A01
Patient departing - Tracking	A09	ADT^A09^ADT_A09	A33	ADT^A33^ADT_A21
Patient arriving - Tracking	A10	ADT^A10^ADT_A09	A32	ADT^A32^ADT_A21

A system implementing this option shall support these 9 trigger events and messages.

Figure 3.31-5 below depicts the messages added by this option to the basic subset.
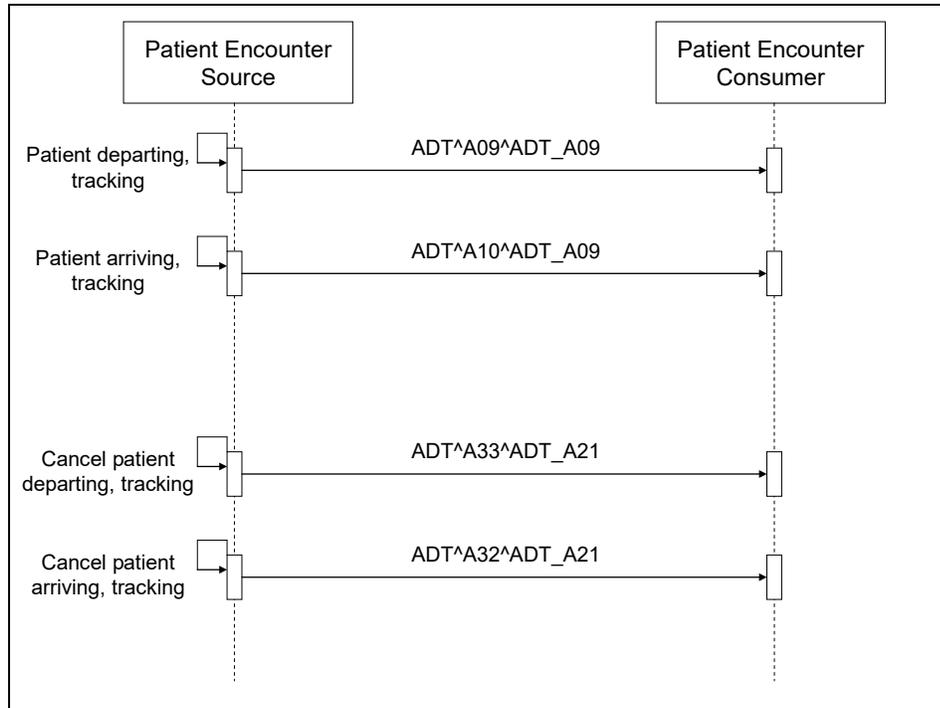
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Figure 3.31-5: Additional Interactions for "Temporary Patient Transfers Tracking" Option

3.31.5.6 Historic Movement Management

This option adds the capability to cancel or update safely any Movement.

The Movement updated can be the current Movement (currently active or pending) or a
Movement in the past (i.e., historic Movement).

The Movement canceled can only be the current Movement (currently active or pending).

This capability is supported by the addition of segment ZBE below PV1/PV2. With this option,
this ZBE segment is required at this position in the messages associated with the following
trigger events: A01, A02, A03, A04, A05, A06, A07, A11, A12, A13, A14, A15, A16, A21,
A22, A25, A26, A27, A38, A52, A53, A54, A55, Z99. In the following sections the ZBE
segment is only shown in the message associated with trigger Z99 which is dedicated to the
Historic Movement Management Option. In the other messages, this segment will appear
whenever this option is active.

This segment ZBE brings the following features:

1140   • It enables unique identification of the Movement (including admission and discharge).

- It carries an action code that describes the action to be performed on this Movement: The three possible actions are:

  - **INSERT**: The receiver must interpret the content of this message as a new Movement.

  - **CANCEL**: This action code is always associated with a "cancel" trigger event. The receiver shall delete the corresponding Movement (matched with its unique identifier). Only the current Movement can be cancelled.

  - **UPDATE**: This action code is associated with the dedicated trigger event Z99 described in Section 3.31.7.30. The receiver shall update the corresponding Movement (matched with its unique identifier), which can be the current Movement or a historic Movement.

- In the case of UPDATE or CANCEL, the ZBE segment carries the code of the original trigger event that was associated with the action INSERT of the related Movement.

- It carries an indicator "Historic Movement" informing whether the action to perform is about the current Movement or a Historic one.

- It provides the starting date/time of the "sub-encounter" that this Movement initiates.

- It carries the ward to which this patient is assigned during this sub-encounter.

This option may apply to any combination of the previous subsets, except Temporary Patient Transfers Tracking (Temporary Patient Transfers do not need to be uniquely identified).

Implementation note: The Patient Encounter Consumer must support transaction log update to maintain integrity of the Movement records.

3.31.5.7 Acknowledgement Support

An actor that claims support for the Acknowledgement Support Option shall be capable of using the enhanced acknowledgement mode as defined in the HL7 v2.x standard. See HL7 Volume 2C, Section C.2.3 for further details.

3.31.5.8 Ambulatory Patient Data

If the Patient Encounter Supplier supports the Ambulatory Patient Data Option, it SHALL supply:

the patient address in field PID-11 for ambulatory patients whenever this address is known

the referring doctor in field PV1-8, if known, when registering an outpatient (MSH-9 Message Type is ADT^A04) or when pre-registering a patient (MSH-9 Message Type is ADT^A05)

the ambulatory status of the patient into field PV1-15 if this information is known.

3.31.5.9 Maintain Demographics Option

This option adds support to manage "Update patient information" and "Merge patient identifier list" in the context of an encounter.

The following is the required message set to support the "Maintain Demographics Option":

Category of event	Trigger / Action				
	insert			cancel	
Admit inpatient	A01	ADT^A01^ADT_A01	A11	ADT^A11^ADT_A09	
Register outpatient	A04	ADT^A04^ADT_A01			
Discharge patient	A03	ADT^A03^ADT_A03	A13	ADT^A13^ADT_A01	
Update patient information	A08	ADT^A08^ADT_A01			
Merge patient identifier list	A40	ADT^A40^ADT_A39			

A Patient Encounter Supplier or Patient Encounter Consumer supporting the Maintain Demographics Option shall support these 7 trigger events and messages.

Figure 3.31-6 depicts the messages added by this option to the basic subset.
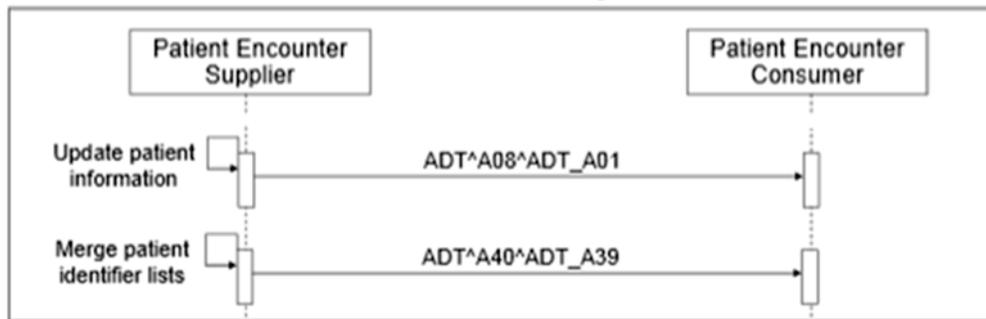
Figure 3.31-6: Additional Interactions for "Maintain Demographics" Option

3.31.6 Common HL7 Message Segments

Messages in transaction ITI-31 use the same common HL7 message segments as those in transaction ITI-30; refer to Section 3.30.5. In addition, messages in transaction ITI-31 use the ZBE segment, described below.

3.31.6.1 ZBE – Movement Action segment

The ZBE segment was introduced in the German extension of the IHE Radiology Technical Framework. It is extended here with three additional fields: ZBE-5, ZBE-6 and ZBE-7. This ZBE segment is required with the "Historic Movement" Option of transaction ITI-31.

The purpose of this segment is to uniquely identify any movement at creation time (action INSERT), so that any further correction brought to this movement (action UPDATE) or cancellation of it (action CANCEL) can be achieved safely and consistently between the two actors Patient Encounter Supplier and Patient Encounter Consumer.

1195

Another security feature offered by this segment is to clearly distinguish current events from events that address a historic (past) movement to avoid any misinterpretation on the part of the receiving application.

1200

Table 3.31-6: ZBE segment description

SEQ	LEN	DT	Usage	Card.	ELEMENT NAME
1		EI	R	[1..*]	Movement ID
2		TS	R	[1..1]	Start Movement Date/Time
3		TS	O	[0..1]	End Movement Date/Time
4		ID	R	[1..1]	Movement Action (INSERT / UPDATE / CANCEL)
5		ID	R	[1..1]	Historical Movement Indicator (values: Y / N)
6		ID	C	[0..1]	Original trigger event code [in the case of an UPDATE of the movement (trigger A08), this field conveys the original trigger event that was sent with the INSERT]
7		XON	O	[0..1]	Responsible Ward (Medical or Nursing Ward, depending of the trigger event of the message)

ZBE-1 – Movement ID (EI): required and repeatable to support cooperative Movement Management. The Movement Identifier list is created with the action INSERT, and then recalled with further actions such as UPDATE or CANCEL.

1205 **ZBE-2 – Start Movement Date/Time (TS)**: Required. It is the date/time of the creation of the Movement, i.e., the effective date time of the event that used action INSERT with this Movement.

ZBE-3 – End Movement Date/Time (TS): Optional.

ZBE-4 – Action (ID): Required. Three possible values:

1210
- INSERT: With any trigger event that inserts a movement.
- UPDATE: With trigger event Z99
- CANCEL: With any "cancel" trigger event.

ZBE-5 –Historic Indicator (ID): Required. Values:

- 'Y' when the message is related to a Historic Movement.

1215
- 'N' when the message is related to the current (last or next) movement.

ZBE-6 – Original Trigger (ID): Conditional.

Condition predicate: This field shall be populated when ZBE-4 contains action UPDATE or CANCEL. In this case, this field is populated with the trigger event that inserted (action INSERT) the movement being currently updated or canceled.

1220 **ZBE-7 – Responsible Ward (XON)**: Optional. This field may be further constrained in national extensions of this transaction. It will, for example, be associated with usage 'RE' in the French extension.

3.31.7 Interactions

The following sections contain the static definitions of the messages belonging to the various
1225 optional sets described above.

The Historic Movement Management Option is not shown in these message tables. The reader is reminded that this option adds the ZBE segment below PV1/PV2.

3.31.7.1 Admit/Visit Notification (ADT^A01^ADT_A01)

3.31.7.1.1 Trigger Event

1230 This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient has arrived at a healthcare facility for an episode of care in which the patient is assigned to an inpatient bed. Such an episode is commonly referred to as "inpatient" care.

MSH-9 is valued **ADT^A01^ADT_A01**.

3.31.7.1.2 Message Static Definition

1235 **Table 3.31-7: Static definition of message ADT^A01^ADT_A01**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6

Segment	Meaning	Usage	Card.	HL7 chapter
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6
PDA	Patient Death and Autopsy	O	[0..1]	3

3.31.7.1.3   Comments on segment usage

Providers with an ongoing relationship with the patient may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments. Providers

1240   specific to a particular insurance carrier may be communicated in ROL segments immediately following the IN1/IN2/IN3 segments.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.1.4   Expected actions

1245   The receiver shall update the patient's status to indicate that the patient has been admitted.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement (new admission) conflicts with an existing current movement for the patient (an admission is already opened for this patient) the message is discarded and an error

1250   condition is raised.

3.31.7.2 Cancel Admit/Visit Notification – ADT^A11^ADT_A09

3.31.7.2.1   Trigger Event

This message is sent by a Patient Encounter Supplier to cancel a previous notification to a Patient Encounter Consumer as a notification that a patient has been admitted for an inpatient stay (via

1255   trigger event A01) or registered for an outpatient visit (via trigger event A04). See Section 3.31.5.8 for the message to be used to cancel a pre-admit notification, and Section 3.31.5.14 for the message to be used to cancel a pending admit notification.

MSH-9 is valued **ADT^A11^ADT_A09**.

3.31.7.2.2   Message Static Definition

1260   **Table 3.31-8: Static definition of message ADT^A11^ADT_A09**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
DG1	Diagnosis Information	X	[0..0]	6

3.31.7.2.3   Comments on segment usage

None.

3.31.7.2.4   Expected actions

The receiver shall reset the patient's status in its system to the value existing immediately before 1265   the admit or visit notification was received.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (i.e., no inpatient nor outpatient visit has been opened for this patient) the message is discarded but no error condition 1270   is raised.

3.31.7.3 Register a Patient (ADT^A04^ADT_A01)

3.31.7.3.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient has arrived at a healthcare facility for an episode of care in which the patient is not 1275   assigned to a bed. Examples of such episodes include outpatient visits, ambulatory care encounters, and emergency room visits.

MSH-9 is valued **ADT^A04^ADT_A01**.

3.31.7.3.2   Message Static Definition

Table 3.31-9: Static definition of message ADT^A04^ADT_A01

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6
PDA	Patient Death and Autopsy	O	[0..1]	3

1280   ### 3.31.7.3.3   Comments on segment usage

Field *PV1-44-admit date/time* is used to carry the date and time that the encounter started.

Providers with an ongoing relationship with the patient may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments. Providers

1285   specific to a particular insurance carrier may be communicated in ROL segments immediately following the IN1/IN2/IN3 segments.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.3.4   Expected actions

1290   The receiver shall update the patient's status to indicate that the visit has started.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case an inpatient encounter is already opened, the outpatient encounter is still recorded by the receiver. This is not a situation of conflict and no error condition is raised.

1295   ## 3.31.7.4 Discharge/End Visit (ADT^A03^ADT_A03)

3.31.7.4.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient's stay at a healthcare facility has ended. Inpatient encounters are generally closed by an A03. Outpatient encounters may or may not be closed by an A03, depending on the
1300   healthcare organization policies.

MSH-9 is valued **ADT^A03^ADT_A03**.

3.31.7.4.2   Message Static Definition

Table 3.31-10: Static definition of message ADT^A03^ADT_A03

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	X	[0..0]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	

Segment	Meaning	Usage	Card.	HL7 chapter
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
OBX	Observation/Result	O	[0..*]	7
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
PDA	Patient Death and Autopsy	O	[0..1]	3

3.31.7.4.3   Comments on segment usage

Field *PV1-3-assigned patient location* is used to indicate the patient's last location prior to discharge (or end of visit).

Field *PV1-45-discharge date/time* is used to carry either the date and time of discharge (for an inpatient) or the date and time that the visit ended (for an outpatient).

Providers with an ongoing relationship with the patient may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments. Providers specific to a particular insurance carrier may be communicated in ROL segments immediately following the IN1/IN2/IN3 segments.

Within a Patient Discharge message, if the encounter has been terminated by the patient's death, then the field PID-30 Patient Death Indicator shall be populated. In this case PID-29 Patient Death Date and Time shall be populated as well, provided that the value is known.

3.31.7.4.4   Expected actions

The receiver shall update the patient's status to "discharged" (or "visit ended").

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no inpatient nor outpatient visit opened for this patient) the message is discarded but no error condition is raised.

3.31.7.5 Cancel Discharge/End Visit – ADT^A13^ADT_A01

3.31.7.5.1 Trigger Event

1325 This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel a previous notification (via trigger event A03) that a patient's stay at a healthcare facility had ended.

MSH-9 is valued **ADT^A13^ADT_A01**.

3.31.7.5.2 Message Static Definition

1330 **Table 3.31-11: Static definition of message ADT^A13^ADT_A01**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6

Segment	Meaning	Usage	Card.	HL7 chapter
PDA	Patient Death and Autopsy	O	[0..1]	3

3.31.7.5.3   Comments on segment usage

Field *PV1-3-patient location* shall contain the patient's location after the cancellation has been processed. This may be different from the patient's location prior to the discharge/end visit notification.

1335 ### 3.31.7.5.4   Expected actions

The receiver shall reset the patient's status to its value prior to the receipt of the discharge/end visit message, and shall update the patient's location to the value in field PV1-3-patient location.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

1340 In case this Movement conflicts with the current situation of the patient (no prior discharge received) the message is discarded but no error condition is raised.

3.31.7.6 Update Patient Information (ADT^A08^ADT_A01)

3.31.7.6.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer
1345 that some non-movement-related information (such as address, date of birth, etc.) has changed for a patient. It is used when information about the patient has changed not related to any other trigger event.

MSH-9 is valued **ADT^A08^ADT_A01**.

3.31.7.6.2   Message Static Definition

1350 **Table 3.31-12: Static definition of message ADT^A08^ADT_A01**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3

Segment	Meaning	Usage	Card.	HL7 chapter
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6
PDA	Patient Death and Autopsy	O	[0..1]	3

3.31.7.6.3   Comments on segment usage

Providers with an ongoing relationship with the patient may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments. Providers
1355   specific to a particular insurance carrier may be communicated in ROL segments immediately following the IN1/IN2/IN3 segments.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.6.4   Expected actions

1360   The receiver shall update the patient record in its database to contain the information in the message.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no active encounter for
1365   this patient, or the patient is unknown) the message is discarded but no error condition is raised.

3.31.7.7 Pre-Admit (ADT^A05^ADT_A05)

3.31.7.7.1 Trigger Event

This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to communicate information that has been collected about a patient to be admitted as an inpatient 1370 (or to be registered as an outpatient).

MSH-9 is valued **ADT^A05^ADT_A05**.

3.31.7.7.2 Message Static Definition

Table 3.31-13: Static definition of message ADT^A05^ADT_A05

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	X	[0..0]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6

Segment	Meaning	Usage	Card.	HL7 chapter
PDA	Patient Death and Autopsy	O	[0..1]	3

3.31.7.7.3   Comments on segment usage

1375   Field *PV2-8-expected admit date/time* is used to carry the expected date and time when the patient is to be admitted (or registered).

Providers with an ongoing relationship with the patient may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments. Providers

1380   specific to a particular insurance carrier may be communicated in ROL segments immediately following the IN1/IN2/IN3 segments.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.7.4   Expected actions

1385   The receiver shall update the patient's status to pre-admitted.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

There is no particular potential conflict between this Movement and any previously received message related to the same patient.

1390   If the receiver does not support the Inpatient/Outpatient Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.8 Cancel Pre-Admit – ADT^A38^ADT_A38

3.31.7.8.1   Trigger Event

This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel

1395   a previous notification (via trigger event A08) that a patient was to be updated to pre-admitted (or pre-registered) status.

MSH-9 is valued **ADT^A38^ADT_A38**.

3.31.7.8.2   Message Static Definition

Table 3.31-14: Static definition of message ADT^A38^ADT_A38

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3

Segment	Meaning	Usage	Card.	HL7 chapter
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..*]	6

1400 ### 3.31.7.8.3   Comments on segment usage

None.

3.31.7.8.4   Expected actions

The receiver shall reset the patient's status to its value prior to the receipt of the pre-admit message.

1405 The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no pre-admit registered for this patient, or the patient is unknown) the message is discarded but no error condition is raised.

1410 If the receiver does not support the Inpatient/Outpatient Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.9 Change Outpatient to Inpatient (ADT^A06^ADT_A06)

3.31.7.9.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer
1415 that it has been decided to admit a patient that was formerly in a non-admitted status, such as Emergency.

MSH-9 is valued **ADT^A06^ADT_A06**.

3.31.7.9.2   Message Static Definition

Table 3.31-15: Static definition of message ADT^A06^ADT_A06

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15

Segment	Meaning	Usage	Card.	HL7 chapter
MRG	Merge Information	C	[0..1]	3
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	X	[0..0]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6

3.31.7.9.3 Comments on segment usage

The new patient location should appear in *PV1-3 - Assigned Patient Location* while the old patient location (if different) should appear in *PV1-6 - Prior Patient Location*.

Condition predicate on use of the segment MRG:

A change from outpatient to inpatient status may be accompanied by the closing of the outpatient account and the opening of an inpatient account. This may be expressed by populating the outpatient account number into *MRG-3-prior account number* and the inpatient account number into *PID-18-patient account number*. The use of the MRG segment in this case is strictly conventional and is not intended to communicate an actual merge.

Providers with an ongoing relationship with the patient may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments. Providers

specific to a particular insurance carrier may be communicated in ROL segments immediately following the IN1/IN2/IN3 segments.

1435 One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.9.4   Expected actions

The receiver shall update the patient's class to "inpatient," and if necessary shall update the patient's location to the value in field *PV1-3-patient location*.

1440 If the MRG segment is included, the receiver shall update the patient's account number from the value in *MRG-3-prior account number* to the value in *PID-18-patient account number*.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no active outpatient
1445 encounter is known for this patient, or the patient is unknown) the message is still processed and initiates a new inpatient encounter for a possibly new patient, and no error condition is raised.

If the receiver does not support the Inpatient/Outpatient Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.10   Change Inpatient to Outpatient (ADT^A07^ADT_A06)

1450 #### 3.31.7.10.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient is no longer in an "admitted" status, but is still being seen for an episode of care.

MSH-9 is valued **ADT^A07^ADT_A06**.

3.31.7.10.2   Message Static Definition

1455 **Table 3.31-16: Static definition of message ADT^A07^ADT_A06**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
MRG	Merge Information	C	[0..1]	3
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	X	[0..0]	3
ROL	Role	O	[0..*]	15

Segment	Meaning	Usage	Card.	HL7 chapter
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6

3.31.7.10.3 Comments on segment usage

The new patient location should appear in *PV1-3 - Assigned Patient Location* while the old patient location (if different) should appear in *PV1-6 - Prior Patient Location*.

Condition predicate on use of the segment MRG:

1460   A change from inpatient to outpatient status may be accompanied by the closing of the inpatient account and the opening of an outpatient account. This may be expressed by populating the inpatient account number into *MRG-3-prior account number* and the outpatient account number into *PID-18-patient account number*. The use of the MRG segment in this case is strictly conventional and is not intended to communicate an actual

1465   merge.

Providers with an ongoing relationship with the patient may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments. Providers specific to a particular insurance carrier may be communicated in ROL segments immediately

1470   following the IN1/IN2/IN3 segments.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.10.4 Expected actions

The receiver shall update the patient's class to "outpatient," and if necessary shall update the patient's location to the value in field *PV1-3-patient location*.

If the MRG segment is included, the receiver shall update the patient's account number from the value in *MRG-3-prior account number* to the value in *PID-18-patient account number*.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no active inpatient encounter is known for this patient, or the patient is unknown) the message is still processed and initiates a new outpatient encounter for a possibly new patient, and no error condition is raised.

If the receiver does not support the Inpatient/Outpatient Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.11 Transfer a Patient (ADT^A02^ADT_A02)

3.31.7.11.1 Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient is being transferred from one location to another. The new location will be reflected in the institution's bed census.

MSH-9 is valued **ADT^A02^ADT_A02**.

3.31.7.11.2 Message Static Definition

Table 3.31-17: Static definition of message ADT^A02^ADT_A02

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
PDA	Patient Death and Autopsy	O	[0..1]	3

3.31.7.11.3   Comments on segment usage

The new patient location should appear in *PV1-3 - Assigned Patient Location* while the old
patient location should appear in *PV1-6 - Prior Patient Location*.

1495

Providers with an ongoing relationship with the patient may be communicated in ROL segments
immediately following the PID/PD1 segments. Providers specific to an episode of care may be
communicated in ROL segments immediately following the PV1/PV2 segments.

One or more OBX segments may be present to carry "permanent observations" such as the
1500 patient weight or height.

Segment DG1 should be used to communicate diagnosis information only if it is necessary to
communicate with a receiver that is using a version of HL7 prior to V2.5.

3.31.7.11.4   Expected actions

The receiver shall update the patient's location to the value in field *PV1-3-patient location*.

1505 The receiver shall report the result of this operation (success / error) in an acknowledgment
message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no active inpatient
encounter is known for this patient, or the patient is unknown or the known patient location was
not the one declared in PV1-6) the message is still processed, the new situation is registered (the
1510 encounter and the patient are created if needed) and no error condition is raised.

If the receiver does not support the Inpatient/Outpatient Encounter Management Option of this
transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.12   Cancel Transfer – ADT^A12^ADT_A12

3.31.7.12.1   Trigger Event

1515 This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel
a previous notification (via trigger event A02) that a patient was being moved from one location
to another.

MSH-9 is valued **ADT^A12^ADT_A12**.

3.31.7.12.2   Message Static Definition

1520 **Table 3.31-18: Static definition of message ADT^A12^ADT_A12**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3

Segment	Meaning	Usage	Card.	HL7 chapter
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
DG1	Diagnosis Information	X	[0..0]	6

3.31.7.12.3 Comments on segment usage

Field *PV1-3-patient location* shall contain the patient's location prior to the transfer.

3.31.7.12.4 Expected actions

The receiver shall reset the patient's location to the value in field *PV1-11-temporary location* or to the value in field *PV1-3-patient location*, as appropriate.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no transfer previously notified, or encounter unknown, or patient unknown) the message is discarded, and no error condition is raised.

If the receiver does not support the Inpatient/Outpatient Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.13   Pending Admit (ADT^A14^ADT_A05)

3.31.7.13.1 Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that it is planned to admit a patient.

MSH-9 is valued **ADT^A14^ADT_A05**.

3.31.7.13.2 Message Static Definition

Table 3.31-19: Static definition of message ADT^A14^ADT_A05

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3

Segment	Meaning	Usage	Card.	HL7 chapter
PV2	Patient Visit – Additional Info	X	[0..0]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6
PDA	Patient Death and Autopsy	O	[0..1]	3

1540

3.31.7.13.3   Comments on segment usage

Field *PV2-8-expected admit date/time* is used to carry the expected date and time when the patient is to be admitted.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

1545

3.31.7.13.4   Expected actions

The receiver shall update the patient's status to "pending admit".

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

There is no particular potential conflict between this Movement and any previously received
1550   message related to the same patient.

If the receiver does not support the Pending Event Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.14 Cancel Pending Admit – ADT^A27^ADT_A21

3.31.7.14.1 Trigger Event

1555   This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel a previous notification (via trigger event A14) that a patient was expected to be admitted.

MSH-9 is valued **ADT^A27^ADT_A21**.

3.31.7.14.2 Message Static Definition

Table 3.31-20: Static definition of message ADT^A27^ADT_A21

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7

1560   #### 3.31.7.14.3 Comments on segment usage

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.14.4 Expected actions

The receiver shall reset the patient's status to its value prior to the receipt of the "pending admit"
1565   message.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no pending admit previously notified, or patient unknown) the message is discarded, and no error condition is
1570   raised.

If the receiver does not support the Pending Event Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.15   Pending Transfer (ADT^A15^ADT_A15)

3.31.7.15.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that it is planned to transfer a patient.

MSH-9 is valued **ADT^A15^ADT_A15**.

3.31.7.15.2   Message Static Definition

Table 3.31-21: Static definition of message ADT^A15^ADT_A15

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
DG1	Diagnosis Information	O	[0..*]	6

3.31.7.15.3   Comments on segment usage

Providers with an ongoing relationship may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

Segment DG1 should be used to communicate diagnosis information only if it is necessary to communicate with a receiver that is using a version of HL7 prior to V2.5.

The planned date for this pending transfer is given in field EVN-3 of segment EVN. See Section 3.30.5.2.

3.31.7.15.4   Expected actions

The receiver shall record that a transfer is pending for this patient.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

1595 In case this Movement conflicts with the current situation of the patient (no active inpatient encounter, or patient unknown) the message is discarded, and no error condition is raised.

If the receiver does not support the Pending Event Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.16 Cancel Pending Transfer – ADT^A26^ADT_A21

3.31.7.16.1 Trigger Event

1600 This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel a previous notification (via trigger event A25) that it was planned to transfer a patient.

MSH-9 is valued **ADT^A26^ADT_A21**.

3.31.7.16.2 Message Static Definition

Table 3.31-22: Static definition of message ADT^A26^ADT_A21

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7

1605 #### 3.31.7.16.3 Comments on segment usage

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

The planned date for the pending transfer that is cancelled, is given in field EVN-3 of segment EVN. See Section 3.30.5.2.

1610 #### 3.31.7.16.4 Expected actions

The receiver shall reset the patient's status to the value immediately before the Pending Transfer message was received.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

1615 In case this Movement conflicts with the current situation of the patient (no pending transfer known, or no active inpatient encounter, or patient unknown) the message is discarded, and no error condition is raised.

If the receiver does not support the Pending Event Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.17   Pending Discharge (ADT^A16^ADT_A16)

3.31.7.17.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that it is planned to discharge a patient.

MSH-9 is valued **ADT^A16^ADT_A16**.

3.31.7.17.2   Message Static Definition

Table 3.31-23: Static definition of message ADT^A16^ADT_A16

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	RE	[0..1]	3
ROL	Role	O	[0..*]	15
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6

3.31.7.17.3 Comments on segment usage

Field *PV2-9-expected discharge date/time* is used to carry the expected date and time when the patient is to be discharged.

1630 One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.17.4 Expected actions

The receiver shall update the patient's status to "pending discharge".

The receiver shall report the result of this operation (success / error) in an acknowledgment
1635 message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no active inpatient encounter, or patient unknown) the message is discarded, and no error condition is raised.

If the receiver does not support the Pending Event Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

1640 ### 3.31.7.18 Cancel Pending Discharge – ADT^A25^ADT_A21

3.31.7.18.1 Trigger Event

This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel a previous notification (via trigger event A16) that a patient was expected to be discharged.

MSH-9 is valued **ADT^A25^ADT_A21**.

1645 ### 3.31.7.18.2 Message Static Definition

Table 3.31-24: Static definition of message ADT^A25^ADT_A21

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7

3.31.7.18.3 Comments on segment usage

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.18.4   Expected actions

The receiver shall reset the patient's status to its value prior to the receipt of the "pending discharge" message.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no pending discharge known, or no active inpatient encounter, or patient unknown) the message is discarded, and no error condition is raised.

If the receiver does not support the Pending Event Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.19   Change Attending Doctor – ADT^A54^ADT_A54

3.31.7.19.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that there has been a change in the doctor responsible for the patient's treatment.

MSH-9 is valued **ADT^A54^ADT_A54**.

3.31.7.19.2   Message Static Definition

Table 3.31-25: Static definition of message ADT^A54^ADT_A54

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ROL	Role	O	[0..*]	15

3.31.7.19.3   Comments on segment usage

Field *PV1-7-attending doctor* shall contain the new attending doctor.

Providers with an ongoing relationship may be communicated in ROL segments immediately following the PID/PD1 segments. Providers specific to an episode of care may be communicated in ROL segments immediately following the PV1/PV2 segments.

Field *ROL-4-role begin date/time* and *ROL-5-role end date/time* are used to communicate the begin and end date and time of the attending doctor (or of the admitting, consulting, and/or

referring doctor, as appropriate and as designated in *ROL-7-role code*). When segment ROL is
used to communicate this information, field *ROL-2-action code* should be valued UP.

3.31.7.19.4   Expected actions

The receiver shall record the patient's new attending doctor.

The receiver shall report the result of this operation (success / error) in an acknowledgment
message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no active inpatient or
outpatient encounter, or patient unknown) the message is discarded, but no error condition is
raised. If the receiver does not support the Advanced Encounter Management Option of this
transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.20   Cancel Change Attending Doctor – ADT^A55^ADT_A52

3.31.7.20.1   Trigger Event

This message is sent by a Patient Encounter Supplier to cancel a previous notification to a Patient
Encounter Consumer of a change to the patient's attending doctor.

MSH-9 is valued **ADT^A55^ADT_A52**.

3.31.7.20.2   Message Static Definition

Table 3.31-26: Static definition of message ADT^A55^ADT_A52

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3

3.31.7.20.3   Comments on segment usage

Field *PV1-7-attending doctor* shall contain the patient's attending doctor prior to the notification
of change.

3.31.7.20.4   Expected actions

The receiver shall reset the patient's attending doctor to the value in field *PV1-7-attending
doctor*.

The receiver shall report the result of this operation (success / error) in an acknowledgment
message returned to the sender.

1700 In case this Movement conflicts with the current situation of the patient (no active inpatient or outpatient encounter, or patient unknown) the message is discarded, but no error condition is raised.

If the receiver does not support the Advanced Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.21   Patient Goes on a Leave of Absence – ADT^A21^ADT_A21

1705 #### 3.31.7.21.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient has left the healthcare institution temporarily.

MSH-9 is valued **ADT^A21^ADT_A21**.

3.31.7.21.2   Message Static Definition

1710
Table 3.31-27: Static definition of message ADT^A21^ADT_A21

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7

3.31.7.21.3   Comments on segment usage

Field *EVN-6-event occurred* shall contain the date and time that the patient actually left the institution. *PV2-47-expected LOA return* shall contain the date and time that the patient is expected to return from the leave of absence.

1715 One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.21.4   Expected actions

The receiver shall record that the patient has left the institution on a leave of absence.

The receiver shall report the result of this operation (success / error) in an acknowledgment
1720 message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no active encounter, or patient unknown) the message is discarded, but no error condition is raised.

If the receiver does not support the Advanced Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.22 Cancel Leave of Absence for a Patient – ADT^A52^ADT_A52

3.31.7.22.1 Trigger Event

This message is sent by a Patient Encounter Supplier to cancel a previous notification to a Patient Encounter Consumer that a patient had left the healthcare institution temporarily.

MSH-9 is valued **ADT^A52^ADT_A52.**

3.31.7.22.2 Message Static Definition

Table 3.31-28: Static definition of message ADT^A52^ADT_A52

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3

3.31.7.22.3 Comments on segment usage

Field *EVN-6-event occurred* shall contain the date and time that the leave of absence was cancelled.

3.31.7.22.4 Expected actions

The receiver shall cancel the patient's leave of absence.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no leave of absence previously notified, or no active encounter, or patient unknown) the message is discarded, but no error condition is raised.

If the receiver does not support the Advanced Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.23   Patient Returns from a Leave of Absence – ADT^A22^ADT_A21

1745   #### 3.31.7.23.1   Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient has returned from a leave of absence.

MSH-9 is valued **ADT^A22^ADT_A21**.

3.31.7.23.2   Message Static Definition

1750   **Table 3.31-29: Static definition of message ADT^A22^ADT_A21**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7

3.31.7.23.3   Comments on segment usage

Field *EVN-6-event occurred* shall contain the date and time that the patient actually returned from the leave of absence. *PV2-47-expected LOA return* shall contain the date and time that the patient was expected to return from the leave of absence.

1755   One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.23.4   Expected actions

The receiver shall record that the patient has returned from the leave of absence.

The receiver shall report the result of this operation (success / error) in an acknowledgment
1760   message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no leave of absence previously notified, or no active encounter, or patient unknown) the message is discarded, but no error condition is raised.

If the receiver does not support the Advanced Encounter Management Option of this transaction,
1765   it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.24 Cancel Patient Return from a Leave of Absence – ADT^A53^ADT_A52

3.31.7.24.1 Trigger Event

This message is sent by a Patient Encounter Supplier to cancel a previous notification to a Patient Encounter Consumer that a patient had returned from a leave of absence.

MSH-9 is valued **ADT^A53^ADT_A52**.

3.31.7.24.2 Message Static Definition

Table 3.31-30: Static definition of message ADT^A53^ADT_A52

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3

3.31.7.24.3 Comments on segment usage

Field *EVN-6-event occurred* shall contain the date and time that the return from leave of absence was cancelled. *PV2-47-expected LOA return* shall contain the date and time that the patient is expected to return from the leave of absence.

3.31.7.24.4 Expected actions

The receiver shall cancel the patient's return from leave of absence.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this Movement conflicts with the current situation of the patient (no return from leave of absence previously notified, or no active encounter, or patient unknown) the message is discarded, but no error condition is raised.

If the receiver does not support the Advanced Encounter Management Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.25 Move account information – ADT^A44^ADT_A43

3.31.7.25.1 Trigger Event

This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that an account previously associated with one patient is now associated with another patient.

MSH-9 is valued **ADT^A44^ADT_A43**.

3.31.7.25.2 Message Static Definition

Table 3.31-31: Static definition of message ADT^A44^ADT_A43

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
---	--- PATIENT begin	R	[1..*]	
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
MRG	Merge Information	R	[1..1]	3
---	--- PATIENT end			

3.31.7.25.3 Comments on segment usage

1795 None.

3.31.7.25.4 Expected actions

The receiver shall associate the account in *MRG-3-prior patient account number* with the patient in *PID-3-patient identifier list*, and shall remove associations of that account with the patient in *MRG-1-prior patient identifier list*.

1800 The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this message conflicts with the current situation (account unknown or supplier patient unknown) the message is discarded, but no error condition is raised.

If the receiver does not support the Advanced Encounter Management Option of this transaction, 1805 it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.26 Patient Departing – Tracking (ADT^A09^ADT_A09)

3.31.7.26.1 Trigger Event

This message is only used within the context of the "Temporary Patient Transfers Tracking" Option.

1810 This message is sent by a Patient Encounter Supplier to notify a Patient Encounter Consumer that a patient has departed a location without the patient's official bed census location having changed. The HL7 standard describes three situations that qualify as non-census location changes: (a) patient tracking (i.e., pre-notification before an official transfer), (b) the patient is in transit between locations for some time, (c) a notification of temporary location change. This 1815 IHE transaction only uses the latter: notification of temporary location change.

MSH-9 is valued **ADT^A09^ADT_A09**.

3.31.7.26.2   Message Static Definition

Table 3.31-32: Static definition of message ADT^A09^ADT_A09

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
DG1	Diagnosis Information	O	[0..*]	6

3.31.7.26.3   Comments on segment usage

1820   If the patient has left for a non-temporary location (tracking), then field *PV1-3-patient location* shall contain the patient's new location and field *PV1-6-prior patient location* shall contain the patient's old location.

If the patient will be in transit for some time, then field *PV1-42-pending location* shall contain the new location and field *PV1-6-prior patient location* shall contain the patient's old location.

1825   If the patient is moving to a temporary location, then field *PV1-11-temporary location* shall contain the new temporary location. If the patient is moving from a temporary location, then field *PV1-43-prior temporary location* shall contain the old temporary location. If the patient is moving from a permanent location, then field *PV1-6-prior patient location* shall contain the old permanent location.

1830   One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

Segment DG1 should be used to communicate diagnosis information only if it is necessary to communicate with a receiver that is using a version of HL7 prior to V2.5.

3.31.7.26.4   Expected actions

1835   The receiver shall reset the patient's location to the value in field *PV1-11-temporary location*, field *PV1-42-pending location*, or field *PV1-3-patient location*, as appropriate.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this message conflicts with the current situation, the message is discarded but no error
1840   condition is raised.

If the receiver does not support the Temporary Patient Location Tracking Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.27 Cancel Patient Departing – Tracking – ADT^A33^ADT_A21

3.31.7.27.1 Trigger Event

1845 This message is only used within the context of the "Temporary Patient Transfers Tracking" Option. This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel a previous notification (via trigger event A09) that a patient has departed a location without the patient's official bed census location having changed.

MSH-9 is valued **ADT^A33^ADT_A21**.

1850 #### 3.31.7.27.2 Message Static Definition

Table 3.31-33: Static definition of message ADT^A33^ADT_A21

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7

3.31.7.27.3 Comments on segment usage

If the patient was in a non-temporary location, then field *PV1-3-patient location* shall contain the patient's location prior to the erroneous A09 event. If the patient was in a temporary location,
1855 then field *PV1-11-temporary location* shall contain the patient's location prior to the erroneous A09 event.

One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.27.4 Expected actions

1860 The receiver shall reset the patient's location to the value in field *PV1-11-temporary location* or to the value in field *PV1-3-patient location*, as appropriate.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

1865 In case this message conflicts with the current situation, the message is discarded but no error condition is raised.

If the receiver does not support the Temporary Patient Location Tracking Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.28 Patient Arriving – Tracking – ADT^A10^ADT_A09

3.31.7.28.1 Trigger Event

1870 This message is only used within the context of the "Temporary Patient Transfers Tracking" Option.

This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer as a notification that a patient has arrived at a new location without the patient's official bed census location having changed. The HL7 standard describes three varieties of these non-census
1875 location changes involving three different kinds of notification: (a) an unofficial notification of location change prior to the official notification of patient tracking, (b) the patient is in transit between locations for some time, (c) a notification of a temporary location change. This IHE transaction only uses the latter: notification of temporary location change.

MSH-9 is valued **ADT^A10^ADT_A09**.

1880 #### 3.31.7.28.2 Message Static Definition

Table 3.31-34: Static definition of message ADT^A10^ADT_A09

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
DG1	Diagnosis Information	X	[0..0]	6

3.31.7.28.3 Comments on segment usage

If the patient is arriving at a temporary location, field *PV1-11-temporary location* shall indicate this temporary location. If the patient is moving from one temporary location to another, then
1885 field *PV1-43-prior temporary location* may also be used.

If the patient is arriving at a permanent location from a temporary location, field *PV1-3-patient location* shall be used for the new location and field *PV1-43-prior temporary location* shall be used for the old location.

One or more OBX segments may be present to carry "permanent observations" such as the
1890   patient weight or height.

3.31.7.28.4 Expected actions

The receiver shall update the patient's location to the value in field *PV1-11-temporary location*
or to the value in field *PV1-3-patient location*, as appropriate.

The receiver shall report the result of this operation (success / error) in an acknowledgment
1895   message returned to the sender.

In case this message conflicts with the current situation, the message is discarded but no error
condition is raised.

If the receiver does not support the Temporary Patient Location Tracking Option of this
transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

1900   ### 3.31.7.29 Cancel Patient Arriving – Tracking – ADT^A32^ADT_A21

3.31.7.29.1 Trigger Event

This message is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to cancel
a previous notification (via trigger event A10) that a patient arrived at a location without the
patient's official bed census location having changed, as for example when the patient arrives at
1905   a diagnostic or treatment service.

MSH-9 is valued **ADT^A32^ADT_A21**.

3.31.7.29.2 Message Static Definition

Table 3.31-35: Static definition of message ADT^A32^ADT_A21

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7

3.31.7.29.3 Comments on segment usage

1910   If the patient was in a non-temporary location, then field *PV1-3 - Assigned Patient Location* may
contain (if known) the original patient location prior to the erroneous A10 (patient arriving-
tracking) event. If the patient was in a temporary location, then field *PV1-11 - Temporary*

Location may contain (if known) the original patient location prior to the erroneous A10 (patient arriving-tracking) event.

1915 One or more OBX segments may be present to carry "permanent observations" such as the patient weight or height.

3.31.7.29.4 Expected actions

If field *PV1-3 - Assigned Patient Location* is populated, the receiver shall reset the patient's permanent location to the value contained in that field. If field *PV1-11 - Temporary Location* is
1920 populated, the receiver shall reset the patient's permanent location to the value contained in that field.

The receiver shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

In case this message conflicts with the current situation, the message is discarded but no error
1925 condition is raised.

If the receiver does not support the Temporary Patient Location Tracking Option of this transaction, it shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.30 Update Patient Movement Information – ADT^Z99^ADT_A01

3.31.7.30.1 Trigger Event

1930 This message is only used within the context of the "Historic Movement Management" Option.

It is sent by a Patient Encounter Supplier to a Patient Encounter Consumer to communicate an update of a Movement, which can be the current Movement or a historic one.

MSH-9 is valued **ADT^Z99^ADT_A01**.

3.31.7.30.2 Message Static Definition

1935 **Table 3.31-36: Static definition of message ADT^Z99^ADT_A01**

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
ROL	Role	O	[0..*]	15
NK1	Next of Kin / Associated Parties	O	[0..*]	3
PV1	Patient Visit	R	[1..1]	3
PV2	Patient Visit – Additional Info	O	[0..1]	3
ZBE	Movement segment	R	[1..1]	
ROL	Role	O	[0..*]	15

Segment	Meaning	Usage	Card.	HL7 chapter
DB1	Disability Information	O	[0..*]	3
OBX	Observation/Result	O	[0..*]	7
AL1	Allergy Information	O	[0..*]	3
DG1	Diagnosis Information	O	[0..*]	6
DRG	Diagnosis Related Group	O	[0..1]	6
---	--- PROCEDURE begin	O	[0..*]	
PR1	Procedures	R	[1..1]	6
ROL	Role	O	[0..*]	15
---	--- PROCEDURE end			
GT1	Guarantor	O	[0..*]	6
---	--- INSURANCE begin	O	[0..*]	
IN1	Insurance	R	[1..1]	6
IN2	Insurance Additional Info.	O	[0..1]	6
IN3	Insurance Additional Info - Cert.	O	[0..1]	6
ROL	Role	O	[0..*]	15
---	--- INSURANCE end			
ACC	Accident Information	O	[0..1]	6
UB1	Universal Bill Information	O	[0..1]	6
UB2	Universal Bill 92 Information	O	[0..1]	6
PDA	Patient Death and Autopsy	O	[0..1]	3

3.31.7.30.3 Comments on segment usage

The ZBE segment is mandatory in this message. See the description of this segment in Section 3.31.6.1.

3.31.7.30.4 Expected actions

Otherwise, the receiver shall update the Movement in its database, and shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

If the receiver does not know the Movement to be updated (identified by ZBE-3 in the ZBE segment), it discards the message and raises an error condition.

A receiver not supporting the Historic Movement Management Option shall application-reject the message (see ITI TF-2x: C.2.3).

3.31.7.31   Merge two patients - ADT^A40^ADT_A39

3.31.7.31.1 Trigger Event

The Patient Encounter Supplier notifies the merge of records for a patient that was incorrectly filed under two different identifiers. This message is only used to merge two patient identifiers of the same type, or two lists of patient identifiers, it is not supposed to update other patient demographics information. The A08 trigger event should be used for this purpose.

MSH-9 is valued **ADT^A40^ADT_A39**.

3.31.7.31.2 Message Static Definition

Table 3.31-37: Static definition of message ADT^Z40^ADT_A39

Segment	Meaning	Usage	Card.	HL7 chapter
MSH	Message Header	R	[1..1]	2
SFT	Software Segment	O	[0..*]	2
EVN	Event Type	R	[1..1]	2
---	--- PATIENT begin	R	[1..1]	
PID	Patient Identification	R	[1..1]	3
PD1	Additional Demographics	O	[0..1]	3
MRG	Merge Information	R	[1..1]	3
PV1	Patient Visit	X	[0..0]	3

3.31.7.31.3 Comments on segment usage

This transaction makes unrepeatable the PATIENT segment group: The message can communicate only one merge operation for one patient.

The "incorrect supplier identifier" identified in the MRG segment (*MRG-1-Prior Patient Identifier List*) is to be merged with the required "correct target identifier" of the same "identifier type code" component identified in the PID segment (*PID-3-Patient Identifier List*). The "incorrect supplier identifier" would then logically never be referenced in future transactions.

The PV1 segment is not supported by IHE in this message.

3.31.7.31.4 Expected actions

The receiver shall merge the two patients in its data base, and shall report the result of this operation (success / error) in an acknowledgment message returned to the sender.

If the receiver does not recognize the target patient identifiers, it shall perform a Change Patient Identifier List instead of a Merge.

If the receiver does not recognize the supplier patient identifiers to be merged, it shall take no action. This situation is not an error.

3.32 Distribute Document Set on Media [ITI-32]

This section corresponds to transaction ITI-32 of the IHE IT Infrastructure Technical Framework. Transaction ITI-32 is used by the Portable Media Creator to create the media content and by Portable Media Importer to read the media content.

3.32.1 Scope

1975 In the Distribute Document Set on Media transaction the Portable Media Creator sends information to media reading actors by means of Interchange Media where it stores the information.

3.32.2 Use Case Roles
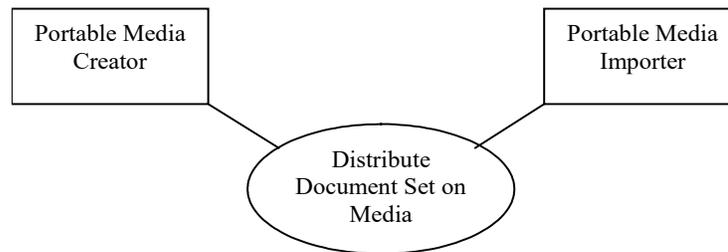
1980 **Actor:** Portable Media Creator

Role: Assemble the media content and store it on the media to be distributed.

Actor: Portable Media Importer

Role: Read the Document Submission Set content of distributed media in order to access the document(s) and the relevant metadata and perform import of the documents on the media.

1985 ### 3.32.3 Referenced Standard

ITI TF-3: 4 Metadata used in Document Sharing profiles

DICOM PS 3.10 Media Storage and File Format for Data Interchange (DICOM file format). http://dicom.nema.org/

DICOM PS 3.12 Media Formats and Physical Media for Data Interchange, Annex F - 120mm
1990 CD-R media, Annex R - USB Connected Removable Devices, Annex V - ZIP File Over Media, and Annex W - Email Media. http://dicom.nema.org/

XHTML™ 1.0 The Extensible HyperText Markup Language (Second Edition). A Reformulation of HTML 4 in XML 1.0. W3C Recommendation 26 January 2000, revised 1 August 2002. http://www.w3.org/TR/xhtml1.

1995 XHTML™ Basic. W3C Recommendation 19 December 2000. http://www.w3.org/TR/xhtm-basic.

MDN: RFC3798 Message Disposition Notification. http://www.rfc-editor.org/rfc/rfc3798.txt

3.32.4 Interaction Diagram

Portable
Media
Creator

Portable
Media
Importer

Distribute Document
Set on Media
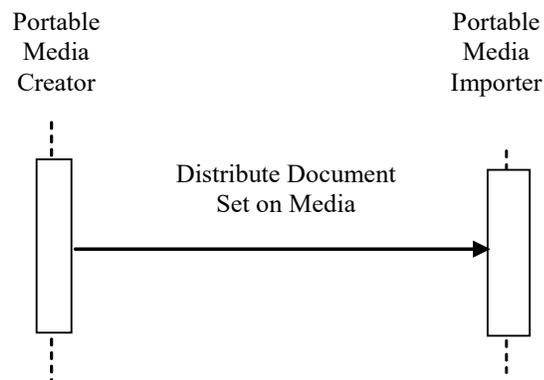
2000 **3.32.4.1 Distribute Document Set on Media**

This transaction defines the interchange of XDS document submission sets on media. It specifies the requirements for a directory structure, and the physical media where stored.

The file directory structure restrictions and file organization are specified below. These are based on industry standard file systems with restrictions chosen based on experience with demonstrated **2005** interoperability in the field of reliable exchange. These are defined in Part 10 of the DICOM standard and summarized below.

The media that are supported are:

- CD-R media. The physical media specification used for the storage on CD-R is a restricted subset of the widely used CD-R media. The restrictions were chosen to ensure **2010** interoperability and media reliability. The standard directory and file structure can be recorded to the CD-R media by widely available software, but this software must be set to comply with the interoperability restrictions on recording format. This media specification relies on the healthcare experience gained by CD-R media widely used in radiology and cardiology. It is defined by Annex F in Part 12 of the DICOM standard and **2015** is also used in the IHE Radiology PDI Profile for the interchange of images,

- USB Removable Devices. This media specification encompasses a wide range of USB connected flash media, removable storage devices, etc. The standard directory and file structure can be recorded onto any of these media by any system that supports the USB Removable Device type defined by the USB Implementers Forum. This specification is **2020** defined in Annex R in Part 12 of the DICOM standard.

- Email transport of ZIP files. This media specification defines the encoding of the directory and file structure as an ordinary ZIP file (maintaining the directory structure) and attaches that ZIP file to an email message. Some additional constraints are added to the email message header to facilitate recognizing the message. This specification is **2025** defined in the annexes to part 12 of the DICOM standard called: ZIP File Media and Email media. The ZIP over Email Response Option enables the Portable Media Importer to send an acknowledgment message to the Portable Media Importer.

3.32.4.1.1 Trigger Events

The user at the Portable Media Creator wishes to transport information by the creation and transport of interchange media. The Portable Media Creator assembles the Interchange Media content and stores it on the media.

If the ZIP over Email Response Option is supported, the Portable Media Importer shall detect whether the Import was successful or not.

3.32.4.1.2 Message Semantics

The message semantics of this transaction are described in terms of content specifications for the media.

The Portable Media Creator shall be able to include one or multiple Submission Set(s), including document(s) and associated metadata. Additionally it shall include a **README.TXT** file and an **INDEX.HTM** and associated files for use to display the media content using a simple browser. It may include other files and directories that the Portable Media Importer will ignore.

3.32.4.1.2.1 Media File system and File Naming Restrictions

The following restrictions are needed to ensure broad interoperability:

- Strict ISO 9660 Level 1 compliance for filenames and directories, even on non-CDR media.

- Strict ISO 9660 Level 1 compliance for recording methods on CDR media. This means no packet writing.

- Filenames should not be in lower case, nor have lower case equivalent file names encoded as Joliet or Rock Ridge extensions to the ISO 9660 file system.

- Only file and folder names referenced by the DICOMDIR file are restricted to 8 characters with no extension. Specifically, it is not permitted to name DICOM files based on their SOP Instance UID, since that would exceed the 8 character limit and use the illegal period character, and it is not permitted to add a ".dcm" extension or similar.

  Note: Refer to RAD TF-3: Appendix E of the IHE Radiology Technical Framework for a reference to common implementation misinterpretations and/or errors that are detrimental to interoperability.

#### 3.32.4.1.2.2 Content Organization Overview
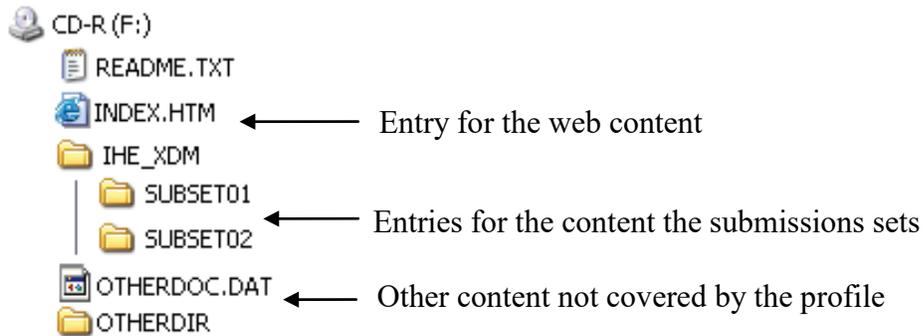
Figure 3.32.4.1-1: General structure of the media

The media shall contain at the "root" directory level, as shown in the figure above:

2060
- An IHE_XDM directory.

- Two files for helping to access the content of the media: *README.TXT* and *INDEX.HTM*

- An Autorun file or equivalent shall not be present in the root directory. Executable files may be present, but shall not be configured to start automatically.

As shown in the figure above, the *IHE_XDM* directory shall contain one sub-directory per
2065 submission set included on the media.

There may be other files present on the media for other purposes, (e.g., use in compliance with the IHE Radiology Portable Data for Imaging (PDI) Profile). The presence or absence of these files shall not affect performance of this transaction.
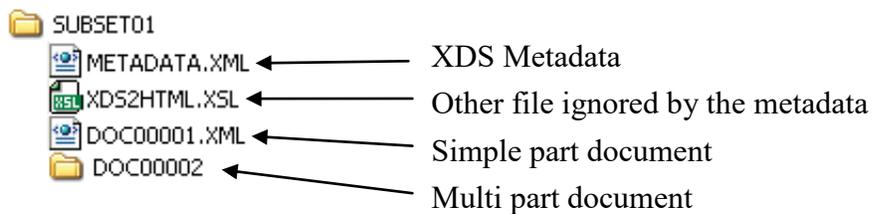
2070
Figure 3.32.4.1-2: Structure of a submission set directory on the media

As shown on the figure above, each submission set directory shall contain:

- A *METADATA.XML* file containing the XDS Registry metadata, as described in ITI TF-3: 4.3.1.2.2. This shall include the metadata as specified in ITI TF-3: Table 4.3.1-3
2075 Metadata Attribute Optionality. This may include XDSFolder objects, associations, and other metadata contents. There is no relationship between an XDSFolder and a media directory, although some people do call media directories "folders". The metadata for the submission set shall include unique and different submissionTime.

2080
- One file for each "simple part" document referenced in the metadata as an XDSDocumentEntry

- One sub-directory for each "multipart" document referenced in the metadata as an XDSDocumentEntry (see ITI TF-3: Table 4.2.3.2-1, attribute mimeType set to "multipart/related")

- Potentially other files and directories that are ignored by the Portable Media Importer

2085 The "multipart" document shall be structured as one sub-directory containing all the parts as file, including the "start" part corresponding to the main file to be open by the "multipart" document viewer. An example of "multipart" document is shown in Figure 3.32.4.1-3.

DOC00002
    DOC00002.XML ← Start part (main file)
    DOC2HTML.XSL ← Other part (file)
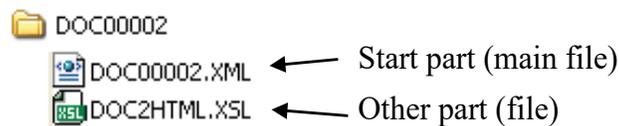
2090 **Figure 3.32.4.1-3: Structure on the media of a directory which is functionally equivalent to "XDS multipart document"**

The URI element of the metadata describing a file that is present on this media shall point to the file containing the document, through a relative URL which corresponds to the file name for simple part document and to the concatenation of the sub-directory and the main file name for
2095 "multipart" document (e.g., DOC00002/DOC00002.XML). Note that in cases where the files are not located within this media directory for the Submission Set, it is possible that the relative URL may begin with "../" so that a single copy the document can be present for multiple purposes.

In Figure 3.32.4.1-2, the METADATA.XML file of the Submission Set stored in the SUBSET01
2100 directory will contain many XDSDocumentEntry objects having their elements set as follows (see ITI TF-3: Table 4.1-5, URI attribute for details):

<ExtrinsicObject id="Document1" mimeType="text/xml"... (with URI set to "DOC00001.XML")

<ExtrinsicObject id="Document2" mimeType="text/xml"... (with URI set to "DOC00002/DOC00002.XML")

The file named *INDEX.HTM* in the root directory shall be encoded in compliance with the
2105 XHTML Basic recommendation from W3C. It may contain a description of the submission sets, including especially:

- Patient ID and demographics

- Source Facility information

Note: XDM Distribute Document Set on Media transaction does not require that all the submission sets included in the
2110 media are relative to the same patient.

It may also describe other content which is on the media, including the means to launch any executable that may be present on the media.

There shall also be a *README.TXT* file located in the root directory that shall contain:

- Contact information regarding the Institution that created the media.

2115
- Information regarding the Application that created the media.

  - Name of the product application and software version

  - Contact information of the vendor of the application that created the media

- General information about the overall organization of the interchange media. This is not intended to be specific to the content stored on this instance of interchange media, which

2120
  if necessary should be placed in the *INDEX.HTM* file.

  - Information regarding the Media Viewer application (if a Media Viewer is contained)

    - Operating system(s) supported

    - Name of the product application and software version

    - Contact information of vendor that provided the Media Viewer application

2125
    - Disclaimer statement about the intended usage of the application

    - List of minimum requirements

    - Additional information regarding the usage of the application

Note that generally the *README.TXT* file is independent of the clinical content of the media, i.e., the same *README.TXT* may be included on all media created by that application at that

2130
institution. Experience has shown that this kind of *README.TXT* file is very valuable for resolving problems.

In addition, if the Portable Media Creator implements support for the Web Content Option of the PDI Profile then the *INDEX.HTM* file must meet the requirements of the PDI Profile Web Content Option.

2135
The *INDEX.HTM* file located in the root directory shall contain:

- An informative header containing:

- Identification of the institution that created the interchange media

- Optionally, a disclaimer statement about privacy/security from the institution that created the interchange media

2140
- a link to an entry point for accessing the web content of the IHE_PDI directory

- a link to the *README.TXT* file

- a link to additional non-constrained data (if it exists)

- a manifest which lists the data that can be imported by a Portable Media Importer (i.e., all DICOM content on the media)

2145   • a manifest which lists any patient-related data contained on the CD that cannot be imported (i.e., additional non-constrained content that doesn't have an importable DICOM equivalent on the media).

    • a link to a launch point for a DICOM viewer, if present on the interchange media

3.32.4.1.2.3 Response message

2150 If the ZIP over Email Response Option is supported and a response was requested, the Portable Media Importer shall send a response, based on the [MDN] mechanism, depending of the success of the Import operation:

    • Success: the MDN "disposition-type" field is set to "displayed"

    • Error: the MDN "disposition-type" field is set to "deleted" and the MDN "disposition-
2155   modifier" is set to "Error: xxxx" where "xxxx" is the text detailing the error.

    Note 1:   Older implementations of MDN might use "processed" instead of "display". The current RFC has removed this option but Portable Media Creator should be prepared to receive it. If they receive it, they have to look in the error field to see whether there is an error.

    Note 2:   The general mechanism for use of Email is described in ITI TF-2x: Appendix T (Informative)

2160 ### 3.32.4.1.3 Media Identification

The Portable Media Creator may add a human-readable identification on the outside of the physical medium, reflecting the originating institution, the time of the creation and content of the media. The method of media marking is outside the scope of this transaction.

If the ZIP over Email Response Option is supported, Portable Media Creator shall be
2165 configurable to include in its message header the request for a response:

    • "Disposition-Notification-To:", followed by the email address to which Portable Media Importer shall send the response

Then, the Portable Media Importer shall acknowledge this operation by sending a MDN response to the email address included in the message.

2170 And finally, the Portable Media Creator shall consider that the import is successful unless:

    • the disposition-modifier contains the word "error" or "failure", case insensitive.

Note: This transaction does not specify how errors should be processed because the variety of appropriate responses is too great.

If the ZIP over Email Option is supported, the subject line of the email shall contain the phrase:

2175   • XDM/1.0/DDM

    Note: In case the same Email complies also with the DICOM Email, it is recommended that the subject contains the phrase: XDM/1.0/DDM+DICOM-ZIP

3.32.4.1.4 Expected Actions

The Portable Media Importer shall verify the integrity of the media by comparing their size and hash with the value of the corresponding entries in the METADATA.XML file of the relevant submission set directory. Mismatching documents shall be indicated to the user. Media faults shall be indicated to the user.

If the XDM Portable Media Importer is grouped with a Content Consumer of one or more IHE Content Profiles, that actor is able to perform its processing on the documents it is designed to support.

> Note: This awkward phrasing means that ability to process data on portable media is described by saying that the processing actor is grouped with a Portable Media Importer.

3.32.4.1.4.1 Basic Patient Privacy Enforcement Option

If the Basic Patient Privacy Enforcement Option is implemented:

1. The Portable Media Creator shall populate the confidentialityCode in the document metadata with the list of values that identify the sensitivity classifications that apply to the associated document. All documents submitted shall have confidentiality codes. The confidentiality codes for different documents in the same submission may be different.

2. The Portable Media Creator shall be able to be configured with the Patient Privacy Policies, Patient Privacy Policy Identifiers (OIDs) and associated information necessary to understand and enforce the policies. The details of this are product specific and not specified by IHE.

3. The Portable Media Creator may have user interface or business rule capabilities to determine the appropriate confidentiality codes for each document. The details of this are product specific and not specified by IHE.

4. The Portable Media Importer shall be able to be configured with the Patient Privacy Policies, Patient Privacy Policy Identifiers (OIDs) and associated information necessary to understand and enforce the policies. The meanings of the codes on the media must be provided out of band, e.g., by telephone, fax, or email. The detail of how this is done is product specific and not specified by IHE. If the documents are transferred internally within the organization or to other members of the recipient's affinity domain, appropriate internal confidentiality codes shall be applied.

5. The Portable Media Creator shall be able to publish the consent documents and any applicable digital signatures that apply to the collection of content that it has created on portable media.

6. The Portable Media Importer shall have the ability to coerce the confidentiality code in the metadata associated with the document from the codes used by the Exporter to the codes used by the Importer.

The Portable Media Importer shall abide by the XDS Affinity Domain Policies represented by the confidentialityCode in the metadata associated with the document. The Portable Media Creator likely will have user access controls or business rule capabilities to determine the details

of how confidentiality codes apply to query results. The details of this are product specific and not specified by IHE. These rules shall reduce the query results to only those that are appropriate to the current situation for that actor and user.

2220 ### 3.32.5 Security considerations

In the case of physical media, encryption of the CD-R or USB shall not be used.

If the ZIP over Email Option is supported, the transaction shall be secured by S/MIME (see IHE ATNA) and comply with the security process as defined in the DICOM Part 15 Appendix (Secure Use of ZIP File Media over Email). The security process requires the use of S/MIME
2225 to both encrypt and sign the message. The encryption is used to maintain confidentiality during the transport. The signature is used to maintain integrity during transport and indicates that the sender is authorized to send the message.

The Portable Media Importer shall check the hash value and size as found in the XDS metadata to detect corruption within the metadata or media. The Portable Media Importer shall notify the
2230 user if any errors are detected.

3.32.5.1 Audit Record Considerations

The Distribute Document Set on Media Transaction is a PHI-Export for the Portable Media Creator and a PHI-Import for the Portable Media Importer as defined in ITI TF-2a: Table 3.20.4.1.1.1-1.

2235 ### 3.32.5.1.1 Portable Media Creator Audit Message

The audit message for a Portable Media Creator shall comply with the specifications in Section 3.41.5.1, with the following exceptions.

1. Event / EventTypeCode shall be ("ITI-32", "IHE Transactions", "Distribute Document Set on Media").

2240 2. Source / UserID is not specialized.

3. Destination / UserID is not specialized.

4. Destination / MediaIdentifier is required.

5. Destination / MediaIdentifier / MediaType is required. The value shall be taken from CID 405, in DICOM PS 3.16.

2245 6. SubmissionSet / ParticipantObjectIDTypeCode shall be ("ITI-32", "IHE Transactions", "Distribute Document Set on Media").

3.32.5.1.2 Portable Media Importer Audit Message

The audit message for a Portable Media Importer shall comply with the specifications in Section 3.41.5.2, with the following exceptions.

2250 1. Event / EventTypeCode shall be ("ITI-32", "IHE Transactions", "Distribute Document Set on Media").

2. Source / UserID is not specialized.

3. Source / MediaIdentifier is required.

4. Source / MediaIdentifier / MediaType is required. The value shall be taken from CID
2255 405, in DICOM PS 3.16.

5. Destination / UserID is not specialized.

6. SubmissionSet / ParticipantObjectIDTypeCode shall be ("ITI-32", "IHE Transactions", "Distribute Document Set on Media").

2260 ## 3.33 Intentionally Left Blank

3.34 Retrieve Form [ITI-34]

This section corresponds to transaction ITI-34 of the IHE IT Infrastructure Technical Framework. Transaction ITI-34 is used by the Form Filler and Form Manager or Form Processor Actors.

3.34.1 Scope

This transaction involves a Form Filler requesting a form from a Form Manager or Form Processor. The Form Filler has a formID, and possibly additional workflow information, obtained by a means that is outside the scope of this transaction. The Form Filler may also provide a form instance id to reference a previously submitted form. The Form Manager or Form Processor will return a form or URL corresponding to the given formID, and optionally a form instance id, or else it returns an error response. Forms are defined and constrained below by the format options.

3.34.2 Use Case Roles
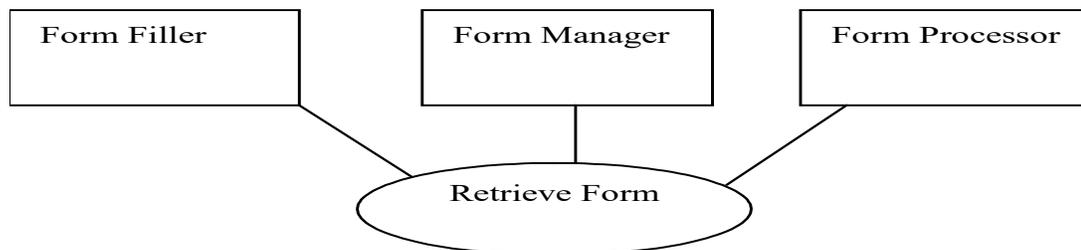
Actor: Form Filler

Role: A forms display and editing system capable of allowing form fields to be completed.

Actor: Form Manager

Role: A system that provides forms based upon requests that provide specific formIDs, and optionally additional work flow data. . Form data is submitted to a Form Receiver.

Actor: Form Processor

Role: A system that provides forms based upon requests that provide specific formIDs, and optionally additional work flow data. Form data from this actor shall be submitted back to itself.

3.34.3 Referenced Standards

Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

IETF RFC1738, Uniform Resource Locators (URL), December 1994, http://www.faqs.org/rfcs/rfc1738.html

IETF RFC2616 HyperText Transfer Protocol HTTP/1.1

2290   Extensible Markup Language (XML) 1.0 (Second Edition). W3C Recommendation 6 October 2000. http://www.w3.org/TR/REC-xml.

ITI TF-2x: Appendix V Web Services for IHE Transactions

XForms 1.1, W3C Working Draft. http://www.w3.org/TR/2004/WD-xforms11-20041115/

XHTML™ 1.0 The Extensible HyperText Markup Language (Second Edition).A Reformulation
2295   of HTML 4 in XML 1.0. W3C Recommendation 26 January 2000, revised 1 August 2002. http://www.w3.org/TR/xhtml1.

XHTML™ Basic. W3C Recommendation 19 December 2000. http://www.w3.org/TR/xhtm-basic.

http://www.w3.org/TR/xhtml-basic

2300

3.34.4 Interaction Diagram
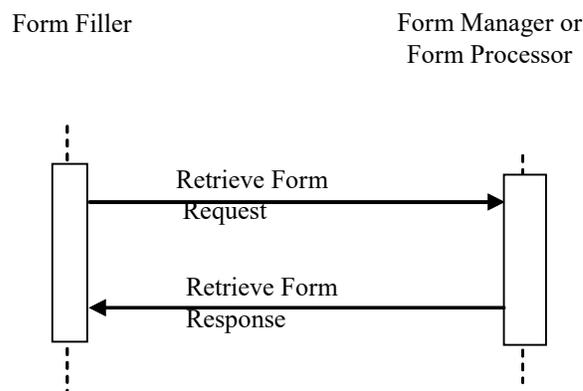
3.34.4.1 Retrieve Form Request

Retrieve Form involves a Form Filler requesting a form from a Form Manager or Form
2305   Processor. The Form Filler shall supply workflow data and prepopulation data. The Form Filler may also supply a form instance id.

The Retrieve Form Request shall provide an archiveURL value, as a nil value or as a URL pointing to a Form Archiver. See Section 3.34.4.1.2 for details.

The Form Filler requests that Form Filler or Form Processor use context information in the
2310   selection and/or creation of the returned form by supplying the prepopData argument with well-formed xml representing the Form Filler context. Specification of the prepopData schema is left to content profiles. This value may be nil.

The Form Filler supplies any additional workflow information to be used in the selection and/or creation of the form using the context element of the workflowData parameter. Specification of this context element is left to content profiles.

The response to a Retrieve Form Request returns the form, or reference to a form, and may return a form instance id.

3.34.4.1.1 Trigger Events

The Form Filler, based upon human decision or application of a rule for automatic operation, requests a form hosted by a Form Manager or Form Processor.

3.34.4.1.2 Message Semantics

Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions. The following parameters are specified for this transaction.

Parameter Name	REQ	Description	Value
prepopData	R	The xml context information supplied by a Form Filler for use in pre-populating form fields	This value shall be nil or a well-formed xml document.
workflowData	R	The xml representation of workflow specific values.	This value is a well-formed xml document.as defined below.
formID	R	The identifier of a form.	A string identifying the form
encodedResponse	R	Tells the Form Manager whether or not to return an encoded response	{true,false}
responseContentType	O	An XML attribute of encodedResponse which specifies the type of expected encoded response	A string whose value is defined by content profiles. Shall not be specified when the value of encodedResponse is "false"
archiveURL	R	Tells the Form Manager whether or not the Form Filler is exercising the Archive Option	the URL of any Form Filler identified Form Archiver or the null string
context	R	The xml specifics of workflow context	Defined by content profiles; may be nil
instanceID	R	An id value of a previously submitted instance of data.	A string identifying an instance of previously submitted data; may be nil.

The contents of the prepopData parameter is defined in a prepopData schema specified by IHE content profiles. When there is no prepopData the attribute xsi:nil shall be set to "true" (see the support materials).

The content of workflowData parameter shall minimally be:

2330

```
       <workflowData>
             <formID>a String identifying the form</formID>
             <encodedResponse>false</encodedResponse>
             <archiveURL />
2335         <context/>
             <instanceID/>
       </workflowData>
```

The responseContentType attribute may be specified only when the value of the encodedResponse parameter is "true". The value for responseContentType attribute specifies the
2340 encoding of the response from the Form Manager or Form Processor. Acceptable values are defined by content profiles. An example of its use is to specify whether the expected response is an XML form definition or an XHTML form. Below is an example of its use:


```
       <workflowData>
2345         <formID>a String identifying the form</formID>
             <encodedResponse>false</encodedResponse>
             <archiveURL />
             <context/>
             <instanceID/>
2350   </workflowData>
```


See the schema provided with the support materials (ftp://ftp.ihe.net/TF_Implementation_Material/ITI/). The workflowData may be extended by IHE content profiles with further definition of the <context> element.

2355 **3.34.4.1.3 Expected Actions**

Upon receipt of the Retrieve Form request, the Form Manager or Form Processor shall parse the request and shall return the requested response in the RetrieveFormResponse element, or errors with SOAP Faults. The Form Manager shall return the form or URL based on the values of: a) the encodedResponse; b) the formID; c) any additional workflowData; d) the optionally supplied
2360 instanceID.

If encodedResponse is 'true', then the response from the Form Manager or Form Processor shall be either a Structured (XML) or Unstructured (non-XML) element. When the encodedResponse parameter is 'true', all anchor addresses that are not fragment identifiers shall be composed of absolute URIs.

2365 If the responseContentType attribute is specified, then the response from the Form Manager or Form Processor shall be a Structured element with appropriate content type, for example, XML form definition or an XHTML form. The Form Manager or Form Processor shall not throw an error if it receives the optional responseContentType attribute.

If encodedResponse is 'false', then the response from the Form Manager or Form Processor shall
2370 be a URL element that can be used directly by a web browser for retrieval and operation of the form.

The Form Manager or Form Processor may assign and return a value for a form instanceID.

When the Form Filler provides a valid URL in the archiveURL parameter of the request, the Form Manager or Form Processor shall return a form that shall perform an Archive Form
2375 transaction upon form submission, in addition to any predefined actions associated with the form submission. As shown in Section 3.36 Archive Form, this additional archival transaction is between Form Filler and Form Archiver Actors.

When the Form Filler supplies data in the prepopData parameter, the Form Manager or Form Processor may use this information to determine the form to be returned and to pre-populate the
2380 fields of the form. The exact use of the prepopData, and the structure, is deferred to the publication of an IHE content profile.

The Form Manager or Form Processor shall use the values within the workflowData parameter, as well as the optionally supplied instanceID, to determine the form to be returned and to pre-populate the fields of the form.

2385 The value of the formID has been previously assigned by the Form Manager or Form Processor to identify a form to be returned to the Form Filler using one of the named format options. A Form Manager or Form Processor may support multiple named options, but for each formID there is only one named option that is supported.

The Form Manager or Form Processor shall use the SOAP Faults defined in Table 3.34.4.1.3-1
2390 when appropriate. Form Fillers shall be capable of accepting other values beyond the ones specified here.

Table 3.34.4.1.3-1: SOAP Faults

Description of error	Code	Reason Text
There is missing information, such as no formID	Sender	Required Information Missing
No form is available	Sender	Unknown formID

An example of a SOAP Fault is:

2395
```
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
              xmlns:xml="http://www.w3.org/XML/1998/namespace">
  <env:Body>
    <env:Fault>
      <env:Code>
2400      <env:Value>env:Sender</env:Value>
      </env:Code>
      <env:Reason>
        <env:Text xml:lang="en">Required Information Missing</env:Text>
      </env:Reason>
2405    </env:Fault>
  </env:Body>
</env:Envelope>
```

3.34.4.1.4 Security Considerations

As noted in the mitigations section of ITI TF-1: 17.5 Security Considerations, endpoints are free to implement TLS as needed for additional privacy and protection. Content profiles, based upon the nature of the data, may require use of ATNA.

3.34.4.2 Retrieve Form Response

3.34.4.2.1 Trigger Events

This message is triggered by a Form Manager or Form Processor responding to a Retrieve Form request.

3.34.4.2.2 Message Semantics

The form or URL is returned.

The following parameters are specified for the response of this transaction:

Element Name	REQ	Description	Constraints
form	R	The xml element container for the form. The form element Shall contain one of: {Structured, Unstructured, URL} and may also contain an instanceID.	An element of type urn:ihe:iti:rfd:2007:formDataType, thus it has only child elements and no value.
form/Structured	O [Note 1]	The xml element container for the return of encoded, structured form content.	xs:any This element may be further constrained by content profiles. May only be present when the Form Request has encodedResponse value of true.
form/Unstructured	O [Note 1]	The xml element container for the return of encoded, unstructured, base64 encoded form content.	xs:base64Binary This element may be further constrained by content profiles. May only be present when the Form Request has encodedResponse value of true.
form/URL	O [Note 2]	The xml element container for the return of a pointer to the form.	xs:anyURI Required when the Form Request has encodedResponse value of false.
form/instanceID	O	The xml element containing the value of a form instance	xs:string
contentType	R	Has no meaning when the Form Request encodedResponse value is false.	xs:string Required; may be nil. The value may be constrained by content profiles.

Element Name	REQ	Description	Constraints
responseCode	R	Not defined.	xs:string Required; may be nil The value may be constrained by content profiles.

2420   Note 1: When the Form Request has encodedResponse value of true, then one of the two fields is required, and the URL field is forbidden.

Note 2: When the Form Request has encodedResponse value of false, then the URL field is required, and Structured and Unstructured are forbidden.

3.34.4.2.3 Expected Actions

2425   The Form Filler shall retrieve from the URLvalue returned if the Retrieve Form encodedResponse value was false.

Regardless of the Retrieve Form encodedResponse value, the Form Filler may fill any form fields needed for form submission, and may display the form for user interaction.

3.34.4.2.3.1 XHTML Handling

2430   A Form Manager or Form Processor shall return a form. If the form is returned as a URL, because encodedResponse is false on the request, the form shall be formatted as XHTML using XHTML Basic and W3C HTML Compatibility Guidelines provided in the Appendix C of the W3C XHTML 1.0 Recommendation. If the form is returned as Structured content, it shall be capable of being transformed into XHTML. In all cases, the returned form shall support the
2435   Submit and all required Archive transactions.

3.34.4.2.3.2 XForm Option

A Form Manager or Form Processor that supports the XForms Option shall additionally be capable of returning a form, whether returned as the response or referenced by a returned URL, that conforms to XForms 1.1. The host language for the XForm shall be XHTML Basic
2440   according to the W3C HTML Compatibility Guidelines provided in the Appendix C of the W3C XHTML 1.0 Recommendation. The returned form shall support the Submit and all required Archive transactions.

3.34.5 Protocol Requirements

The Retrieve Form request and response shall be transmitted using Synchronous Web Services
2445   Exchange, according to the requirements specified in ITI TF-2x: Appendix V.

The Retrieve Form transaction shall use SOAP 1.2.

WSDL Namespace Definitions

ihe	urn:ihe:iti:rfd:2007
soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2005/08/addressing
xsd	http://www.w3.org/2001/XMLSchema

These are the requirements for the Retrieve Form transaction presented in the order in which they would appear in the WSDL definition:

2450
- The following types shall be imported (xds:import) in the /definitions/types section:
    - Namespace="urn:ihe:iti:rfd:2007", schema="RFD.xsd"
- The /definitions/message/part/@element attribute of the Retrieve Form Request message shall be defined as: "ihe:RetrieveFormRequest"

2455
- The /definitions/message/part/@element attribute of the Retrieve Form Response message shall be defined as: "ihe:RetrieveFormResponse"
- The /definitions/portType/operation/input/@wsaw:Action attribute for the Retrieve Form Request message shall be defined as "urn:ihe:iti:2007:RetrieveForm"
- The /definitions/portType/operation/output/@wsaw:Action attribute for the Retrieve Form Response message shall be defined as: "urn:ihe:iti:2007:RetrieveFormResponse"

2460
- The /definitions/binding/operation/soap12:operation/@soapActionRequired attribute shall be defined as "false"

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.34.5.1 Sample SOAP Messages.

2465 An informative WSDL for the Form Manager and a full XML Schema Document for the RFD types is available online on the IHE FTP site. See ITI TF-2x: Appendix W.

3.34.5.1 Sample SOAP Messages

The samples in the following two sections show a typical SOAP request and its relative SOAP response. The sample messages also show the WS-Addressing headers <Action/>,

2470 <MessageID/>, .; these WS-Addressing headers are populated according to ITI TF-2x: Appendix V: Web Services for IHE Transactions. Some of the body of the SOAP message is omitted for brevity.

3.34.5.1.1 Sample Retrieve Form SOAP Request

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
 <soap:Header>
    <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>
    <wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
    <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
2007:RetrieveForm</wsa:Action>
 </soap:Header>
 <soap:Body>
   <RetrieveFormRequest xmlns="urn:ihe:iti:rfd:2007">
    <prepopData>...some xml content...</prepopdata>
    <workflowData>
```

2475

2480

2485

```
2490
            <formID>1</formID>
            <encodedResponse>false</encodedResponse>
            <archiveURL />
            <context />
            <instanceID />
          </workflowData>
        </RetrieveFormRequest>
      </soap:Body>
2495  </soap:Envelope>
```

3.34.5.1.2 Sample Retrieve Form SOAP Response

```
2500  <soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Header>
                   <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>

2505  <wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
              <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
      2007:RetrieveFormResponse</wsa:Action>
        </soap:Header>
        <soap:Body>
2510      <RetrieveFormResponse xmlns="urn:ihe:iti:rfd:2007">
            <form>
              <URL>http://somehost/xxx/services/someForm</URL>
              <instanceID>1.2.3.4.5</instanceID>
            </form>
2515      <contentType />
          <responseCode />
        </RetrieveFormResponse>
      </soap:Body>
      </soap:Envelope>
2520
```

3.35 Submit Form [ITI-35]

This section corresponds to transaction ITI-35 of the IHE IT Infrastructure Technical Framework. Transaction ITI-35 is used by the Form Filler and Form Receiver or Form Processor Actors.

2525 ### 3.35.1 Scope

This transaction involves a Form Filler submitting a form to a Form Receiver or Form Processor.

3.35.2 Use Case Roles
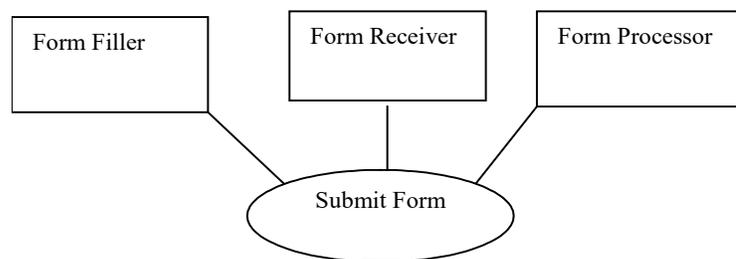
2530

Actor: Form Filler

Role: A forms display and editing system capable of allowing form fields to be completed.

Actor: Form Receiver

2535 **Role:** A system that receives submitted form data from forms constructed by Form Managers.

Actor: Form Processor

Role: A system that receives submitted form data from forms constructed by this same instance of the Form Processor.

3.35.3 Referenced Standards

2540 Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

IETF RFC1738, Uniform Resource Locators (URL), December 1994, http://www.faqs.org/rfcs/rfc1738.html

IETF RFC2616 HyperText Transfer Protocol HTTP/1.1

2545 Extensible Markup Language (XML) 1.0 (Second Edition). W3C Recommendation 6 October 2000. http://www.w3.org/TR/REC-xml.

ITI TF-2x: Appendix V Web Services for IHE Transactions

3.35.4 Interaction Diagram
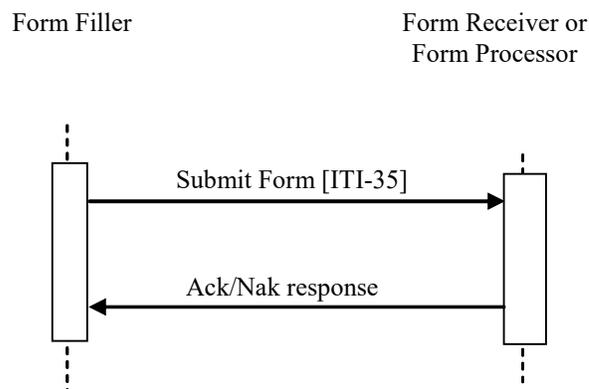
2550

3.35.4.1 Submit Form

This transaction is initiated by a Form Filler submitting form instance data, using XML as a format, to a Form Receiver or Form Processor.

3.35.4.1.1 Trigger Events

2555 The Submit Form transaction is triggered by the submission action from within the form.

3.35.4.1.2 Message Semantics

The Submit Form transaction shall carry a SubmitFormRequest element, with submitted form data as XML child elements of the SubmitFormRequest element. Content profiles may further constrain the content of the SubmitFormRequest element.

2560 See the schema provided with the support materials (see ITI TF-2x: Appendix W).

3.35.4.1.3 Expected Actions

Upon receipt of the Submit Form request, the Form Receiver or Form Processor shall return a SubmitFormResponse element, or errors with SOAP Faults, for example if the posted data cannot be recognized.

2565 The Form Filler may display the results of the response from the Form Receiver or Form Processor.

The Form Receiver or Form Processor shall use the SOAP Faults defined in Table 3.35.4.1.3-1 when appropriate. Form Fillers shall be capable of accepting other values beyond the ones specified here.

2570

Table 3.35.4.1.3-1: SOAP Faults

Description of error	Code	Reason Text
Cannot recognize the posted data	Sender	Required Information Missing

An example of a SOAP Fault is:

```
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
        xmlns:xml="http://www.w3.org/XML/1998/namespace">
<env:Body>
  <env:Fault>
    <env:Code>
      <env:Value>env:Sender</env:Value>
    </env:Code>
    <env:Reason>
      <env:Text xml:lang="en">Required Information Missing</env:Text>
    </env:Reason>
  </env:Fault>
</env:Body>
</env:Envelope>
```

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3.35.4.2 Submit Form Response

3.35.4.2.1 Trigger Events

This message is triggered by a Form Filler submitting form instance data.

3.34.4.2.2 Message Semantics

2590   The Submit Form Response shall return a SubmitFormResponseType element containing:

- A responseCode string that may be constrained by Content Profiles

- An optional content element containing formData, as is returned by RetrieveFormResponse

- An optional contentType string that may be constrained by Content Profiles.

2595   See the schema provided with the support materials (see ITI TF-2x: Appendix W).

3.35.4.2.3 Expected Actions

The Form Filler may display the results of the response from the Form Receiver or Form Processor. The form behavior may be further profiled by content domain profiles.

3.35.5 Protocol Requirements

2600   Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

The Submit Form transaction shall use SOAP 1.2.

WSDL Namespace Definitions

ihe	urn:ihe:iti:rfd:2007
soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2005/08/addressing
xsd	http://www.w3.org/2001/XMLSchema

2605

These are the requirements for the Submit Form transaction presented in the order in which they would appear in the RFD Submit Form WSDL definition:

- The following types shall be imported (xds:import) in the /definitions/types section:

  - Namespace="urn:ihe:iti:rfd:2007", schema="RFD.xsd"

2610
- The /definitions/message/part/@element attribute of the Submit Form Request message shall be defined as: "ihe:SubmitFormRequest"

- The /definitions/message/part/@element attribute of the Submit Form Response message shall be defined as: "ihe:SubmitFormResponse"

- Refer to Table 3.35.5-1 for additional attribute requirements.

2615

Table 3.35.5-1: Additional Attribute Requirements

Attribute	Value
/definitions/portType/operation@name	SubmitForm
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2007:SubmitForm
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2007:SubmitFormResponse
/definitions/binding/operation/wsoap12:operation/@soapActionRequired	false

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.35.5.1 Sample SOAP Messages.

2620 For informative WSDL see ITI TF-2x: Appendix W.

The <ihe:SubmitFormRequest> element is defined as:

- One or more <xs:any> elements

This allows the Form Manager to construct forms that submit form data using any XML representation.

2625 The <ihe:SubmitFormResponseType> element is defined as:

- An optional <ihe:content> element which is of type <ihe:formDataType> as also used in the Retrieve Form Response. If present it shall contain:

- One of the following:

  - <ihe:Structured> containing XML encoding of a form

2630
  - <ihe:Unstructured> containing base64Binary encoding of a form

  - <ihe:URL> containing the URL of a form

  - An optional <ihe:instanceID> of type xs:string.

- An optional <ihe:contentType> element, of type xs:string.

- A required <ihe:responseCode> element of type xs:string.

2635 ### 3.35.5.1 Sample SOAP Messages

The samples in the following two sections show a typical SOAP request and its relative SOAP response. The sample messages also show the WS-Addressing headers <Action/>,

<MessageID/>, .; these WS-Addressing headers are populated according to ITI TF-2x: Appendix V: Web Services for IHE Transactions. Some of the body of the SOAP message is omitted for
2640 brevity.

3.35.5.1.1 Sample Submit Form SOAP Request

```
<?xml version='1.0' encoding='UTF-8'?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
2645 xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Header>
            <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>
            <wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
            <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
2650 2007:SubmitForm</wsa:Action>
        </soap:Header>
        <soap:Body>
            <SubmitFormRequest xmlns="urn:ihe:iti:rfd:2007">
                    …
2655            </SubmitFormRequest>
        </soap:Body>
</soap:Envelope>
```

3.35.5.1.2 Sample Submit Form SOAP Response

```
<?xml version='1.0' encoding='UTF-8'?>
2660 <soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Header>
            <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>
2665            <wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
                <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
2007:SubmitFormResponse</wsa:Action>
        </soap:Header>
        <soap:Body>
2670            <SubmitFormResponseType xmlns="urn:ihe:iti:rfd:2007">
                    <content>
                            <URL>http://somehost/xxx/services/someForm</URL>
```

```
                              <instanceID>1.2.3.4.5</instanceID>
                          </content>
2675                   <contentType />
                       <responseCode />
                 </SubmitFormResponseType>
           </soap:Body>
     </soap:Envelope>
```

2680 ### 3.35.6 Security Considerations

As noted in the mitigations section of ITI TF-1: 17.5 Security Considerations, endpoints are free to implement TLS as needed for additional privacy and protection. Content profiles, based upon the nature of the data, may require use of ATNA.

2685
3.36 Archive Form [ITI-36]

This section corresponds to transaction ITI-36 of the IHE IT Infrastructure Technical Framework. Transaction ITI-36 is used by the Form Filler and Form Archiver Actors.

3.36.1 Scope

This transaction involves a Form Filler submitting form instance data to a Form Archiver.

2690

3.36.2 Use Case Roles
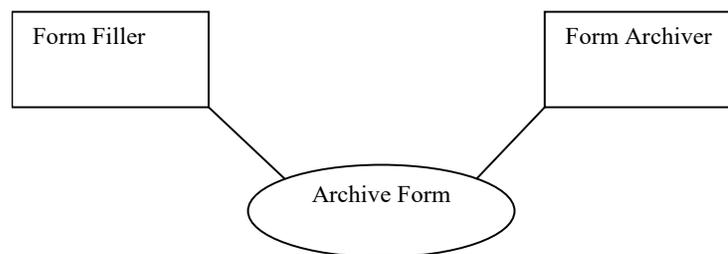
2695   **Actor:** Form Filler

Role: A forms display and editing system capable of allowing form fields to be completed.

Actor: Form Archiver

Role: A system that receives submitted forms for archival purposes.

3.36.3 Referenced Standards

2700   Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

IETF RFC1738, Uniform Resource Locators (URL), December 1994, http://www.faqs.org/rfcs/rfc1738.html

IETF RFC2616 HyperText Transfer Protocol HTTP/1.1

2705   Extensible Markup Language (XML) 1.0 (Second Edition). W3C Recommendation 6 October 2000. http://www.w3.org/TR/REC-xml.

3.36.4 Interaction Diagram

Form Filler   Form
                                               Archiver

Archive Form [ITI-36]

Ack/Nak response
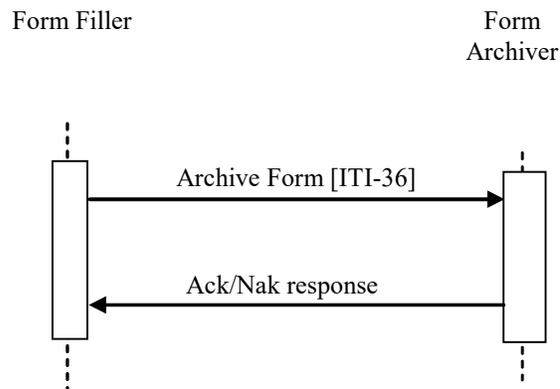
2710
3.36.4.1 Archive Form

This transaction is initiated by a Form Filler submitting a data to a Form Archiver for archival
purposes.

3.36.4.1.1 Trigger Events

The Form Filler shall use this transaction to submit data to a Form Archiver for archival
2715   purposes. The Archive Form transaction may be initiated by a Form Filler, or it may be triggered
as a secondary submission action from within a form.

3.36.4.1.2 Message Semantics

The Archive Form transaction shall carry an ArchiveFormRequest element, with submitted form
data as XML child elements of the ArchiveFormRequest element. Content profiles may further
2720   constrain the content of the ArchiveFormRequest element.

See the schema provided with the support materials (see ITI TF-2x: Appendix W).

3.36.4.1.3 Expected Actions

Upon receipt of the Archive Form request, the Form Archiver shall return an
ArchiveFormResponse element, or errors with SOAP Faults, for example if the posted data
2725   cannot be recognized.

The Form Filler may display the results of the response from the Form Archiver.

The Form Archiver shall use the SOAP Faults defined in Table 3.36.4.1.3-1 when appropriate.
Form Fillers shall be capable of accepting other values beyond the ones specified here.

2730

Table 3.36.4.1.3-1: SOAP Faults

Description of error	Code	Reason Text
Cannot recognize the posted data	Sender	Required Information Missing

An example of a SOAP Fault is:

```
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
        xmlns:xml="http://www.w3.org/XML/1998/namespace">
2735    <env:Body>
    <env:Fault>
        <env:Code>
            <env:Value>env:Sender</env:Value>
        </env:Code>
2740        <env:Reason>
            <env:Text xml:lang="en">Required Information Missing</env:Text>
        </env:Reason>
    </env:Fault>
</env:Body>
2745    </env:Envelope>
```

3.36.4.2 Archive Form Response

3.36.4.2.1 Trigger Events

This message is triggered by a Form Filler archiving form instance data.

2750 ### 3.36.4.2.2 Message Semantics

An ArchiveFormResponse element is returned, which contains:

- A responseCode string that may be constrained by Content Profiles

See the schema provided with the support materials (see ITI TF-2x: Appendix W).

3.36.4.2.3 Expected Actions

2755 The Form Filler may display the results of the response from the Form Archiver. The form behavior may be further profiled by content domain profiles.

3.36.5 Protocol Requirements

The Archive Form request and response shall be transmitted using Synchronous Web Services 2760 Exchange, according to the requirements specified in ITI TF-2x: Appendix V.

The Archive Form transaction shall use SOAP 1.2.

WSDL Namespace Definitions

ihe	urn:ihe:iti:rfd:2007
soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2005/08/addressing
xsd	http://www.w3.org/2001/XMLSchema

These are the requirements for the Archive Form transaction presented in the order in which they would appear in the Archive Form WSDL definition:

- The following types shall be imported (xds:import) in the /definitions/types section:

  - Namespace="urn:ihe:iti:rfd:2007", schema="RFD.xsd"

- The /definitions/message/part/@element attribute of the Archive Form Request message shall be defined as: "ihe:ArchiveFormRequest"

- The /definitions/message/part/@element attribute of the Archive Form Response message shall be defined as: "ihe:ArchiveFormResponse"

- Refer to Table 3.36.5 for additional attribute requirements.

Table 3.36.5: Additional Attribute Requirements

Attribute	Value
/definitions/portType/operation@name	ArchiveForm
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2007:ArchiveForm
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2007:ArchiveFormResponse
/definitions/binding/operation/wsoap12:operation/@soapActionRequired	false

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.36.5.1 Sample SOAP Messages.

For informative WSDL see ITI TF-2x: Appendix W.

The <ihe:ArchiveFormRequest> element is defined as:

- One or more <xs:any> elements

This allows the Form Manager to construct forms that archive form data using any XML representation.

The <ihe:ArchiveFormResponse> element is defined as:

- A required <ihe:responseCode> element of type xs:string.

2785 ### 3.36.5.1 Sample SOAP Messages

The samples in the following two sections show a typical SOAP request and its relative SOAP response. The sample messages also show the WS-Addressing headers <Action/>,

<MessageID/>, .; these WS-Addressing headers are populated according to ITI TF-2x: Appendix V: Web Services for IHE Transactions. Some of the body of the SOAP message is omitted for
2790 brevity.

3.36.5.1.1 Sample Archive Form SOAP Request

```
<?xml version='1.0' encoding='UTF-8'?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
2795 xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Header>
            <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>
            <wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
            <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
2800 2007:ArchiveForm</wsa:Action>
        </soap:Header>
        <soap:Body>
            <ArchiveFormRequest xmlns="urn:ihe:iti:rfd:2007">
                …
2805            </ArchiveFormRequest>
        </soap:Body>
</soap:Envelope>
```

3.36.5.1.2 Sample Archive Form SOAP Response

```
<?xml version='1.0' encoding='UTF-8'?>
2810 <soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Header>
            <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>
2815            <wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
            <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
2007:ArchiveFormResponse</wsa:Action>
        </soap:Header>
        <soap:Body>
2820        <ArchiveResponse xmlns="urn:ihe:iti:rfd:2007">
                <responseCode />
            </ArchiveFormResponse>
        </soap:Body>
</soap:Envelope>
```

2825

3.36.6 Security Considerations

As noted in the mitigations section of ITI TF-1: 17.5 Security Considerations, endpoints are free to implement TLS as needed for additional privacy and protection. Content profiles, based upon the nature of the data, may require use of ATNA.

2830

3.37 Retrieve Clarifications [ITI-37]

This section corresponds to transaction ITI-37 of the IHE IT Infrastructure Technical Framework. Transaction ITI-37 is used by the Form Filler and Form Manager or Form Processor Actors.

2835 **3.37.1 Scope**

This transaction involves a Form Filler requesting a set of clarifications from a Form Manager or Form Processor. A Form Filler supporting the Retrieve Clarifications Option shall perform this request periodically, based upon a duration defined by or agreed upon with the Form Manager / Form Receiver or Form Processor. Note that not all use cases will need to support this option.

2840 The Form Filler has an orgID, obtained by a means that is outside the scope of this transaction, and the Form Manager or Form Processor will either return a form that contains either the data to be clarified or a set of links to other forms that can be retrieved using the Retrieve Form transaction. All updates / clarifications / new data are submitted to the Form Receiver using the Submit Form transaction.

2845 **3.37.2 Use Case Roles**
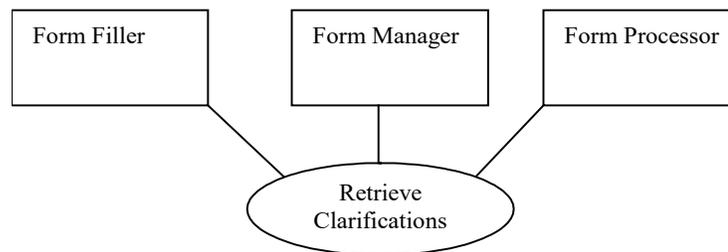
Actor: Form Filler

Role: A forms display and editing system capable of allowing form fields to be completed.

2850 **Actor:** Form Manager

Role: A system that provides clarification information based upon requests that provide specific orgIDs.

Actor: Form Processor

Role: A system that provides clarification information based upon requests that provide specific
2855 orgIDs.

3.37.3 Referenced Standards

IETF RFC1738, Uniform Resource Locators (URL), December 1994,
http://www.faqs.org/rfcs/rfc1738.html

IETF RFC2616 HyperText Transfer Protocol HTTP/1.1

2860   Extensible Markup Language (XML) 1.0 (Second Edition). W3C Recommendation 6 October 2000. http://www.w3.org/TR/REC-xml.

ITI TF-2x: Appendix V Web Services for IHE Transactions

XForms 1.1, W3C Working Draft. http://www.w3.org/TR/2004/WD-xforms11-20041115/

2865   **3.37.4 Interaction Diagram**
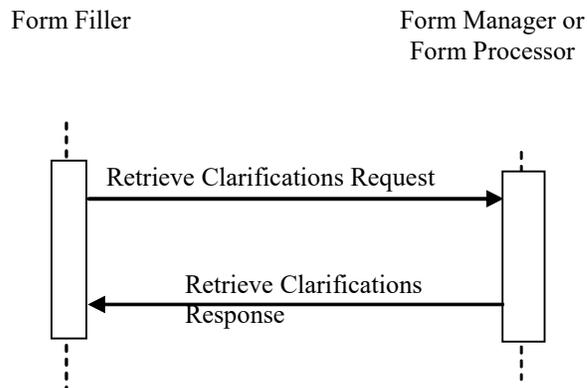
3.37.4.1 Retrieve Clarifications Request

This transaction is initiated whenever a Form Filler which supports the Retrieve Clarifications Option needs to obtain clarification information relevant to the organization or site.

2870   **3.37.4.1.1 Trigger Events**

The Retrieve Clarification event is triggered by the need for information on current clarifications to be made available within an EHR system. The transaction does not specify when the Retrieve Clarification happens, only that this transaction is available when information regarding clarifications is needed from a Form Manager or Form Processor. It is the responsibility of the
2875   Form Filler that supports this option to periodically execute this transaction.

3.37.4.1.2 Message Semantics

Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

The following parameters are specified for this transaction.

2880

Parameter Name	REQ	Description	Value
clarificationData	R	The xml representation of clarification specific values.	This value is a well-formed xml document.as defined below.

Parameter Name	REQ	Description	Value
orgID	R		A string identifying the organization
encodedResponse	R	Tells the Form Manager whether or not to return an encoded response	{true,false}
archiveURL	R	Tells the Form Manager whether or not the Form Filler is exercising the Archive Option	the URL of any Form Filler identified Form Archiver; may be nil
context	R	The xml specifics of workflow context	Defined by content profiles; may be nil

The clarificationData may be extended by IHE content profiles with further definition of the <context> element. The content of clarificationData shall minimally be:
<clarificationData>
2885   <orgID>a String identifying the form</orgID>
        <encodedResponse>false</encodedResponse>

</clarificationData>

2890 3.37.4.1.3 Expected Actions

Upon receipt of the Retrieve Clarifications request, the Form Manager or Form Processor shall parse the request and shall return the requested response in the RetrieveClarificationsResponse element, or errors with SOAP Faults.

The Form Manager or Form Processor shall return the form or URL based on the values of: a) 2895 the encodedResponse; b) the orgID; c) any additional clarificationData.

If no clarification information is available, this is shall be indicated by a form indicating that no clarification information is available.

If encodedResponse is 'true', then the response from the Form Manager or Form Processor shall be either a Structured (XML) or Unstructured (non-XML) element. When the encodedResponse 2900 parameter is 'true' all anchor addresses that are not fragment identifiers shall be composed of absolute URIs.

If encodedResponse is 'false', then the response from the Form Manager or Form Processor shall be a URL element that can be used directly by a web browser for retrieval and operation of the form.

2905 The value of the orgID has been previously assigned by the Form Manager or Form Processor and identifies use one of the named format options. A Form Manager may support multiple named options, but for each orgID there is only one named option that is supported.

The Form Manager shall use the SOAP Faults defined in Table 3.37.4.1.3-1 when appropriate. Form Fillers shall be capable of accepting other values beyond the ones specified here.

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Table 3.37.4.1.3-1: SOAP Faults

Description of error	Code	Reason Text
There is missing information, such as no orgID	Sender	Required Information Missing
No form is available	Sender	Unknown orgID

An example of a SOAP Fault is:

```
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
              xmlns:xml="http://www.w3.org/XML/1998/namespace">
  <env:Body>
    <env:Fault>
      <env:Code>
        <env:Value>env:Sender</env:Value>
      </env:Code>
      <env:Reason>
        <env:Text xml:lang="en">Unknown orgID</env:Text>
      </env:Reason>
    </env:Fault>
  </env:Body>
</env:Envelope>
```

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The orgID has been assigned by the Form Manager or Form Processor use one of the named format options. A Form Manager or Form Processor may support multiple named options, but for each orgID there is only one named option that is supported.

2930 **3.37.4.1.4 Security Considerations**

The security considerations for the Retrieve Clarifications request message are no different than those of the Retrieve Form request message (see Section 3.34.4.1.4).

3.37.4.2 Retrieve Clarifications Response

3.37.4.2.1 Trigger Events

2935 The Delivery of a Form is triggered by a Form Manager or Form Processor providing a form based upon the orgID supplied with the Retrieve Clarifications transaction.

3.37.4.2.2 Message Semantics

The form or URL is returned in response to the Retrieve Clarifications.

3.37.4.2.3 Expected Actions

2940 The Form Filler may display the form or navigate to the returned URL to retrieve the form.

3.37.4.2.3.1 XHTML Handling

A Form Manager or Form Processor shall return a form, whether returned as the response or referenced by a returned URL, formatted as XHTML using XHTML Basic and W3C HTML Compatibility Guidelines provided in the Appendix C of the W3C XHTML 1.0
2945 Recommendation. The returned form shall support the Submit and all required Archive transactions.

3.37.4.2.3.2 XForm Option

A Form Manager or Form Processor that supports the XForms Option shall additionally be capable of returning a form, whether returned as the response or referenced by a returned URL,
2950 that conforms to XForms 1.1. The host language for the XForm shall be XHTML Basic according to the W3C HTML Compatibility Guidelines provided in the Appendix C of the W3C XHTML 1.0 Recommendation. The returned form shall support the Submit and all required Archive transactions.

3.37.5 Protocol Requirements

2955 The Retrieve Clarifications request and response shall be transmitted using Synchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V.

The Retrieve Clarifications transaction shall use SOAP 1.2.

WSDL Namespace Definitions

ihe	urn:ihe:iti:rfd:2007
soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2005/08/addressing
xsd	http://www.w3.org/2001/XMLSchema

2960 These are the requirements for the Retrieve Clarifications transaction presented in the order in which they would appear in the WSDL definition:

- The following types shall be imported (xds:import) in the /definitions/types section:

  - Namespace=" urn:ihe:iti:rfd:2007", schema="RFD.xsd"

- The /definitions/message/part/@element attribute of the Retrieve Clarifications Request
2965 message shall be defined as: "ihe:RetrieveClarificationsRequest"

- The /definitions/message/part/@element attribute of the Retrieve Clarifications Response message shall be defined as: "ihe:RetrieveClarificationsResponse"

- The /definitions/portType/operation/input/@wsaw:Action attribute for the Retrieve Clarifications Request message shall be defined as
2970 "urn:ihe:iti:2007:RetrieveClarifications"

- The /definitions/portType/operation/output/@wsaw:Action attribute for the Retrieve Clarifications Response message shall be defined as: "urn:ihe:iti:2007:RetrieveClarificationsResponse"

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- The /definitions/binding/operation/soap12:operation/@soapActionRequired attribute shall be defined as "false"

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.34.5.1 Sample SOAP Messages.

An informative WSDL for the Form Manager and a full XML Schema Document for the RFD types is available online on the IHE FTP site. See ITI TF-2x: Appendix W.

3.37.5.1 Sample SOAP Messages

The samples in the following two sections show a typical SOAP request and its relative SOAP response. The sample messages also show the WS-Addressing headers <Action/>,

<MessageID/>, …; these WS-Addressing headers are populated according to

2985   ITI TF-2x: Appendix V: Web Services for IHE Transactions.

3.37.5.1.1 Sample Retrieve Clarifications SOAP Request

```xml
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Header>
            <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>

<wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
        <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
2007:RetrieveClarifications</wsa:Action>
  </soap:Header>
  <soap:Body>
    <RetrieveClarificationsRequest xmlns="urn:ihe:iti:rfd:2007">
      <clarificationData>
        <orgID>123</formID>
        <encodedResponse>false</encodedResponse>
        <archiveURL />
        <context />
      </clarificationData>
    </RetrieveClarificationsRequest>
  </soap:Body>
</soap:Envelope>
```

3010   ### 3.37.5.1.2 Sample Retrieve Clarifications SOAP Response

```
3015

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```

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Header>
            <wsa:To>http://localhost:4040/axis2/services/someservice</wsa:To>

<wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
        <wsa:Action soap:mustUnderstand="1">urn:ihe:iti:
2007:RetrieveClarificationsResponse</wsa:Action>
  </soap:Header>
  <soap:Body>
    <RetrieveClarificationsResponse xmlns="urn:ihe:iti:rfd:2007">
      <form>
       <URL>http://somehost/xxx/services/someForm</URL>
      </form>
      <contentType />
      <responseCode />
    </RetrieveClarificationsResponse>
  </soap:Body>
</soap:Envelope>
```

3.38 Cross Gateway Query [ITI-38]

This section corresponds to transaction ITI-38 of the IHE ITI Technical Framework. Transaction ITI-38 is used by cooperating Initiating Gateway and Responding Gateway Actors.

3.38.1 Scope

The scope of the Cross Gateway Query transaction is based on the Registry Stored Query [ITI-18] transaction. The same set of stored queries is required to be supported and the options controlling what kind of data is returned are the same. Differences from the Registry Stored Query transactions are:

- The Cross Gateway Query is between an Initiating Gateway and Responding Gateway.

- Initiating Gateway shall specify the homeCommunityId attribute in all Cross-Community Queries which do not contain a patient identifier.

- The homeCommunityID attribute shall be returned within all appropriate elements.

- Responding Gateways shall support the Asynchronous Web Services Exchange Option on the Cross Gateway Query. Support for this function is required in order to enable use of Asynchronous Web Services Exchange in any cross-community interaction. Without this support an Initiating Gateway would require unique configuration, per Responding Gateway, to know if Asynchronous Web Services Exchange was supported. It is expected that Asynchronous Web Services Exchange will be desired by the majority of communities.

- Asynchronous Web Services Exchange is an option on the Initiating Gateway, see ITI TF-1: 18.2.2.

- For stored queries that rely on concepts that a community may not support, namely associations, folders and submission sets, a Responding Gateway is allowed to respond with zero entries.

There shall be an agreed upon common coding/vocabulary scheme used for the Cross Gateway Query. For example, a common set of privacy consent vocabularies shall be used.

3.38.2 Use Case Roles
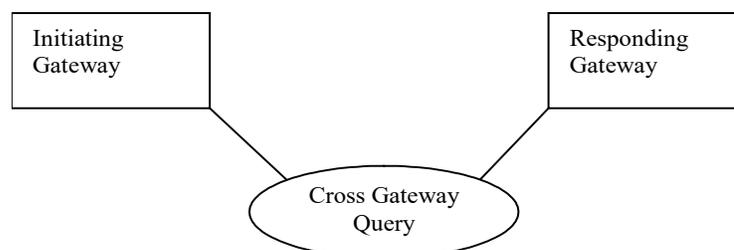
Figure 3.38.2-1: Use Case Roles

Actor: Initiating Gateway

Role: To formulate a Cross Gateway Query on behalf of a user.

3065   **Actor:** Responding Gateway

Role: To respond to a Cross Gateway Query based on the internal configuration of the community.

3.38.3 Referenced Standard

Implementers of this transaction shall comply with all requirements described in ITI TF-2x:
3070   Appendix V Web Services for IHE Transactions.

ebRIM   OASIS/ebXML Registry Information Model v3.0

ebRS   OASIS/ebXML Registry Services Specifications v3.0

ITI TF-3:4   Metadata used in Document Sharing profiles

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3.38.4 Interaction Diagram
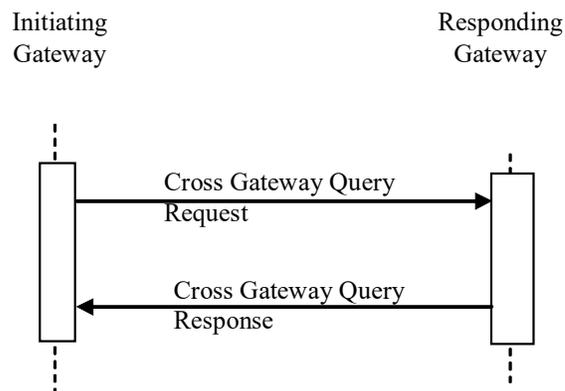
3.38.4.1 Cross Gateway Query

This is a query request between an Initiating Gateway and a Responding Gateway. The query
3080   request contains:

- A reference to a pre-defined query defined by the Registry Stored Query [ITI-18]. transaction

- Parameters to the query. The query parameters are defined by the Registry Stored Query transaction. The homeCommunityId attribute is required for every Registry Stored Query
3085   which does not specify a patient identity.

3.38.4.1.1 Trigger Events

This message is initiated when the Initiating Gateway has determined that it must interact with the Responding Gateway to satisfy a Registry Stored Query [ITI-18] request received from an XDS.b Document Consumer or a query request from other internal non-IHE actor. When
3090 initiating this message to satisfy a Registry Stored Query [ITI-18] request the Initiating Gateway shall pass all parameters, either known or unknown, into the Cross Gateway Query.

3.38.4.1.2 Message Semantics

The message semantics are based on the Registry Stored Query. See ITI TF-2a: 3.18.4.1.2.

Initiating Gateways which support the On-Demand Documents Option shall be capable of
3095 querying for an On-Demand Document Entry either through internal mechanisms or, when the XDS Affinity Domain Option is also declared, through interaction with an XDS Document Consumer which supports the On-Demand Documents Option.

Responding Gateways which support the On-Demand Documents Option shall be able to respond to a query of an On-Demand Document Entry, either through internal mechanisms or,
3100 when grouped with a Document Consumer, through interaction with appropriate XDS Actors which support On-Demand Documents. Of special note are the use of homeCommunityId, specifying the patient identifier and special handling of some stored queries. These are explained below.

3.38.4.1.2.1 homeCommunityId

3105 The homeCommunityId attribute is required on the Cross Gateway Query. The homeCommunityId is a globally unique identifier for a community and is used to obtain the Web Services endpoint of services that provide access to data in that community. homeCommunityId is structured as an OID limited to 64 characters and specified in URI syntax, for example the homeCommunityId of 1.2.3 would be formatted as `urn:oid:1.2.3`.

3110 Its use is as follows:

- It is returned within the response to Cross Gateway Query and Registry Stored Query transactions to indicate the association of a response element with a community. It is specified as the ebRIM 'home' attribute within the relevant response elements. Document Consumers process the value as an opaque unique identifier.

3115 - It is an optional parameter to Registry Stored Query requests, not requiring a patient id parameter, and Retrieve Document Set requests to indicate which community to direct the request.

The Initiating Gateway shall specify the homeCommunityId parameter within all queries which do not include a patient identifier parameter. These would be queries which specify an
3120 entryUUID or uniqueID. The homeCommunityId shall contain the value that identifies the community associated with the Responding Gateway. The homeCommunityId value is specified as the home attribute on the AdhocQuery element of the query request, as in:
`<AdhocQuery id="…" home="urn:oid:1.2.3" … >`

3125 Each Cross Gateway Query request can have at most one homeCommunityId value. If multiple entryUUID or uniqueID values are specified they must all be associated with the same homeCommunityId value. Multiple individual query requests can be used to retrieve data associated with different homeCommunityIds.

3.38.4.1.2.2 Specifying patient identifier

3130 The Initiating Gateway shall specify in relevant queries a patient identifier known to the Responding Gateway. The mechanism used by the Initiating Gateway to determine the correct patient identifier to use is outside the intended scope of this transaction. The Responding Gateway can expect to be able to resolve the patient identifier. If the patient identifier is unknown by the Responding Gateway's community, the Responding Gateway shall return either a successful response with no elements or an error with errorCode XDSUnknownPatientId,

3135 depending on local policy.

3.38.4.1.2.3 Special handling of some stored queries

Some stored queries rely on the support of concepts which may not be used within a community. It is also possible that a Responding Gateway community may have policies which restrict the sharing of information related to those concepts. The concepts of concern are submission sets,

3140 folders and associations. In either case a Responding Gateway shall respond to the appropriate stored queries by returning zero results. Table 3.38.4.1.2.3-1 lists all the stored queries which rely on specialized concepts.

Table 3.38.4.1.2.3-1: Stored Queries

Query Name	Concepts	Requirement
FindDocuments	None	Required by all
FindSubmissionSets	Submission Set	Zero elements when no submission set concept in community
FindFolders	Folder	Zero elements when no folder concept in community
GetAll	Submission Set, Folder, Association	Return all appropriate document entries and other entries depending on which of the other concepts the community supports
GetDocuments	None	Required by all
GetFolders	Folder	Zero elements when no folder concept in community
GetAssociations	Association	Zero elements when no association concept in community
GetDocumentsAndAssociations	Association	Return only document entries if no association concept
GetSubmissionSets	Submission Set	Zero elements when no submission set concept in community
GetSubmissionSetAndContents	Submission Set	Zero elements when no submission set concept in community
GetFolderAndContents	Folder	Zero elements when no folder concept in community
GetFoldersForDocument	Folder	Zero elements when no folder concept in community
GetRelatedDocuments	Association	Zero elements when no association concept in community

3145 **3.38.4.1.3 Expected Actions**

Actors supporting this transaction shall support the Expected Actions described in ITI TF-2a: 3.18.4.1.3.

In addition, the Responding Gateway shall:

- Return an XDSUnknownCommunity error code if the value of homeCommunityId is
3150 specified and is not known by the Responding Gateway.

- Verify the homeCommunityId is specified on relevant queries and return an XDSMissingHomeCommunityId error code if missing.

- Route the query to the local XDS Document Registry or perform equivalent action to form a query response. When routing to a local XDS Document Registry, the Responding
3155 Gateway shall pass all parameters into the Registry Stored Query [ITI-18] transaction.

- When routing a response from a local XDS Document Registry, the Responding Gateway shall pass all entities received in the Registry Stored Query response into the response to the Cross Gateway Query.

- Ensure that the response contains a value identifying one of the Responding Gateway's
3160 communities for the homeCommunityId attribute in every appropriate element. The elements that shall include the ebRIM home attribute are:

  - If returntype="LeafClass" the ExtrinsicObject and RegistryPackage elements shall contain the home attribute.

  - If returnType="ObjectRef" the ObjectRef element shall contain the home attribute.

3165 - Ensure that every RegistryError element returned in the response shall have the location attribute set to one of the homeCommunityIds of the Responding Gateway.

The Initiating Gateway shall:

- On receiving the response from the Responding Gateway, verify the homeCommunityId is present where appropriate. If homeCommunityId is not present in any of the
3170 ExtrinsicObject, RegistryPackage or ObjectRef elements the Initiating Gateway shall reflect an XDSMissingHomeCommunityId to the initiator of the transaction – either the Document Consumer or the internal actor. All XDSMissingHomeCommunityId errors generated by the Initiating Gateway shall include, in the context of the message, identification of the Responding Gateway that returned the invalid response and the
3175 element or elements that were in error.

- If the XDS Affinity Domain Option is supported and if needed, consolidate results from multiple Responding Gateways. This includes reflecting in the consolidated results returned in response to the originating Registry Stored Query [ITI-18] all successes and failures received from Responding Gateways. If both successes and failures are received
3180 from Responding Gateways, the Initiating Gateway shall return both RegistryObjectList and RegistryErrorList in one response and specify PartialSuccess status. If an XDSUnknownPatientId error is returned from a Responding Gateway then the Initiating

Gateway shall not include this error in the consolidated results sent to the Document Consumer. The removal of the XDSUnknownPatientId is done to maintain compatibility with the XDS Profile's use of Registry Stored Query since Document Consumers are not expecting to receive this error. Other than removal of the XDSUnknownPatientId, the Initiating Gateway shall pass all entities received in the Cross Gateway Query response into the response to the Registry Stored Query [ITI-18].

3.38.4.1.3.1 Compatibility of Options

The presence or absence of the optional $XDSDocumentEntryType parameter triggers the behaviors on the Responding Gateway. If this value is specified, and the Responding Gateway (or XDS community supported by the Responding Gateway) does not support it, it shall be ignored. If it is specified, and the Responding Gateway (or underlying XDS community) does support it, the proper information is returned. See ITI TF-2a: 3.18.4.1.2.5 for more details regarding compatibility of the Registry Stored Query transaction.

3.38.4.1.3.2 Assigning homeCommunityID to Responding Gateway

As described in ITI TF-2a: 3.18.4.1.2.3.8, the homeCommunityId is used to identify a community. Initiating Gateways and Responding Gateways use this value to route requests, normally through lookup in a directory. As an identifier of a community, the homeCommunityId is a larger concept than a single Responding Gateway, which may represent one or more communities. In fact, a community may be represented by several Responding Gateways and a Responding Gateway may represent many communities. Thus, the relationship between Responding Gateways and homeCommunityIds is a multiple to multiple relationship. But the following rules do apply:

- An Initiating Gateway may route query and retrieve requests either by looking up the homeCommunityId in a directory or by sending the request to the Responding Gateway from which it received the homeCommunityId. If the Initiating Gateway looks up the homeCommunityId in a directory, the Responding Gatewaty that it finds may not be the Responding Gateway that returned the value.

- The Responding Gateway shall accept and properly route all query and retrieve requests containing any homeCommunityId that it returned in a prior query response.

- If the deployment requires that the Initiating Gateway and Responding Gateway use a common directory, then all homeCommunityIds returned by a Responding Gateway should be available for lookup in the common directory. If a community is represented by more than one Responding Gateway, the directory may map the homeCommunityId to one or more of the associated Responding Gateways.

3.38.4.1.4 Security Considerations

Both the Initiating Gateway and Responding Gateway shall audit the Cross Gateway Query. The audit entries shall be equivalent to the entries required for the Registry Stored Query.

The Initiating Gateway:

- • If receiving a Registry Stored Query transaction from a Document Consumer, shall audit as if it were a Document Registry. See ITI TF-2a: 3.18.5.1.2.

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- • In addition, shall audit the Cross Gateway Query as if it were a Document Consumer except that for EventTypeCode the Initiating Gateway shall specify EV("ITI-38", "IHE Transactions", and "Cross Gateway Query") (see ITI TF-2a: 3.18.5.1.1).

- • In addition, if interacting with a local Document Registry, shall audit as if it were a Document Consumer (see ITI TF-2a: 3.18.5.1.1).

- • The Responding Gateway:

3230
- • Shall audit the Cross Gateway Query as if it were a Document Registry except that for EventTypeCode the Responding Gateway shall specify EV("ITI-38", "IHE Transactions", "Cross Gateway Query"). See ITI TF-2a: 3.18.5.1.2.

- • In addition, if interacting with a local Document Registry, shall audit as if it were a Document Consumer. See ITI TF-2a: 3.18.5.1.1.

3.38.5 Protocol Requirements

3235 The Cross Gateway Query request and response will be transmitted using Synchronous or Asynchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V. The protocol requirements are identical to the Registry Stored Query except as noted below.

Table 3.38.5-1: WSDL Namespace Definitions

soap	http://schemas.xmlsoap.org/wsdl/soap/
soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2006/05/addressing/wsdl/
xsd	http://www.w3.org/2001/XMLSchema
ihe	urn:ihe:iti:xds-b:2007
rs	urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0
lcm	urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
query	urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0

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Responding Gateway: These are the requirements for the Cross Gateway Query transaction presented in the order in which they would appear in the Responding Gateway WSDL definition:

- • The following types shall be imported (xsd:import) in the /definitions/types section:

- • namespace=" urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0",
3245 schemaLocation="query.xsd"

- • The /definitions/message/part/@element attribute of the Cross Gateway Query Request message shall be defined as "query:AdhocQueryRequest"

- The /definitions/message/part/@element attribute of the Cross Gateway Query Response message shall be defined as "query:AdhocQueryResponse"

3250 - Refer to Table 3.38.5-2 below for additional attribute requirements

Table 3.38.5-2: Additional Attribute Requirements

Attribute	Value
/definitions/portType/operation@name	RespondingGateway_CrossGatewayQuery
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2007:CrossGatewayQuery
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2007:CrossGatewayQueryRespon se
/definitions/binding/operation/wsoap12:operation/@soapAction Required	false

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full
3255 sample request and response messages are in Section 3.38.5.1 Sample SOAP Messages.

For informative WSDL for the Responding Gateway see ITI TF-2x: Appendix W.

3.38.5.1 Sample SOAP Messages

The samples in the following two sections show a typical SOAP request and its relative SOAP response. The sample messages also show the WS-Addressing headers <Action/>,
3260 <MessageID/>, <ReplyTo/>…; these WS-Addressing headers are populated according to the W3C WS-Addressing standard. The body of the SOAP message is omitted for brevity; in a real scenario the empty element will be populated with the appropriate metadata.

Samples presented in this section are also available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3265 **3.38.5.1.1 Sample Cross Gateway Query SOAP Request**

3.38.5.1.1.1 Synchronous Web Services Exchange

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:a="http://www.w3.org/2005/08/addressing">
  <s:Header>
    <a:Action s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayQuery</a:Action>
    <a:MessageID>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:MessageID>
    <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">http://localhost/service/IHEXCARespondingGateway.svc</a:To>
  </s:Header>
  <s:Body>
    <query:AdhocQueryRequest xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"/>
  </s:Body>
</s:Envelope>
```

3.38.5.1.1.2 Asynchronous Web Services Exchange

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:a="http://www.w3.org/2005/08/addressing">
  <s:Header>
    <a:Action s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayQuery</a:Action>
    <a:MessageID>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:MessageID>
    <a:ReplyTo>
      <a:Address>http://192.168.2.4:9080/XcaService/InitiatingGatewayReceiver.svc</a:Address>
    </a:ReplyTo>
    <a:To s:mustUnderstand="1">http://localhost/XcaService/RespondingGatewayReceiver.svc</a:To>
  </s:Header>
  <s:Body>
    <query:AdhocQueryRequest xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"/>
  </s:Body>
</s:Envelope>
```

3.38.5.1.2 Sample Cross Gateway Query SOAP Response

3.38.5.1.2.1 Synchronous Web Services Exchange

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:a="http://www.w3.org/2005/08/addressing">
  <s:Header>
    <a:Action s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayQueryResponse</a:Action>
    <a:RelatesTo>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:RelatesTo>
  </s:Header>
  <s:Body>
    <query:AdhocQueryResponse xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"/>
  </s:Body>
</s:Envelope>
```

3.38.5.1.2.2 Asynchronous Web Services Exchange

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:a="http://www.w3.org/2005/08/addressing">
  <s:Header>
    <a:Action s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayQueryResponse</a:Action>
    <a:MessageID>urn:uuid:D6C21225-8E7B-454E-9750-821622C099DB</a:MessageID>
    <a:RelatesTo>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:RelatesTo>
    <a:To s:mustUnderstand="1">http://localhost:2647/XcaService/InitiatingGatewayReceiver.svc
    </a:To>
  </s:Header>
  <s:Body>
    <query:AdhocQueryResponse xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"/>
  </s:Body>
</s:Envelope>
```

3.39 Cross Gateway Retrieve [ITI-39]

This section corresponds to transaction ITI-39 of the IHE Technical Framework. Transaction ITI-39 is used by the Initiating Gateway and Responding Gateway Actors.

3.39.1 Scope

The scope of the Cross Gateway Retrieve transaction is semantically the same as the Retrieve Document Set transaction [ITI-43]. Differences from the Retrieve Document Set transactions are:

- The Cross Gateway Retrieve is between an Initiating Gateway and a Responding Gateway.

- The 'homeCommunityId' parameter is required. This means that the homeCommunityId parameter which is optional on the Retrieve Document Set transaction is required by this transaction.

- Responding Gateways shall support the Asynchronous Web Services Exchange Option on the Cross Gateway Retrieve. Support for this function is required in order to enable use of Asynchronous Web Services Exchange in any cross-community interaction. Without this support an Initiating Gateway would require unique configuration, per Responding Gateway, to know if Asynchronous Web Services Exchange was supported. It is expected that Asynchronous Web Services Exchange will be desired by the majority of communities.

- Asynchronous Web Services Exchange is an option on the Initiating Gateway, see ITI TF-1: 18.2.2.

3.39.2 Use Case Roles
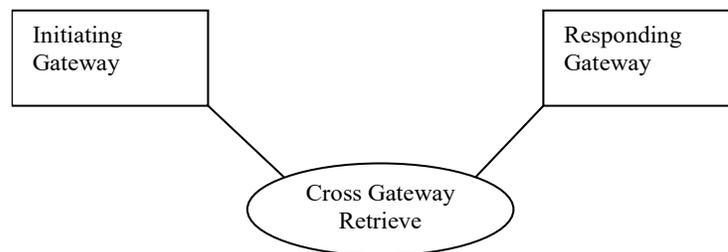
Figure 3.39.2-1: Use Case Roles

Actor: Initiating Gateway

Role: To formulate a Cross Gateway Retrieve in response to Retrieve Document Set transactions or other internal interaction.

Actor: Responding Gateway

Role: To return the documents requested.

3.39.3 Referenced Standard

Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V Web Services for IHE Transactions.

3355   ebRIM   OASIS/ebXML Registry Information Model v3.0

ebRS   OASIS/ebXML Registry Services Specifications v3.0

ITI TF-3:4   Metadata used in Document Sharing profiles

MTOM   SOAP Message Transmission Optimization Mechanism
http://www.w3.org/TR/soap12-mtom/

3360   ### 3.39.4 Interaction Diagram
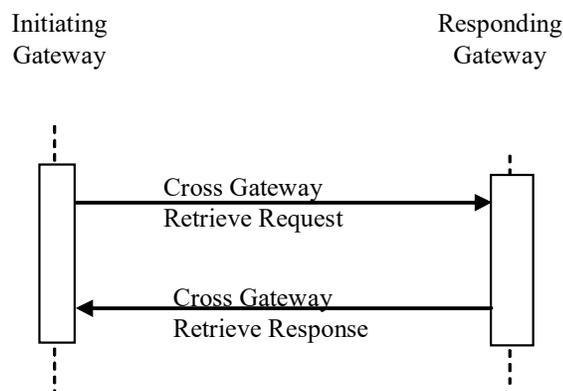
3.39.4.1 Cross Gateway Retrieve Request

The Cross Gateway Retrieve Request uses the same syntax and standards as the Retrieve Document Set Request. See Section ITI TF-2b: 3.43.4.1.

3365   #### 3.39.4.1.1 Trigger Events

This message is initiated by the Initiating Gateway to retrieve a set of documents from another community represented by a Responding Gateway. The Initiating Gateway may be responding to a Retrieve Document Set transaction or may use a proprietary mechanism for triggering the Cross Gateway Retrieve.

3370   #### 3.39.4.1.2 Message Semantics

The message semantics for Cross Gateway Retrieve are the same as Retrieve Document Set (s Section 3.43.4.1.2). The Initiating Gateway shall specify the homeCommunityId parameter within the Retrieve Document Set. The homeCommunityId shall contain the value that identifies the community associated with the Responding Gateway.

3375   Initiating Gateways which support the On-Demand Documents Option shall be capable of retrieving an On-Demand Document Entry either through internal mechanisms or, when the XDS Affinity Domain Option is also declared, through interaction with an XDS Document Consumer which supports the On-Demand Documents Option.

       Responding Gateways which support the On-Demand Documents Option shall be able to
3380   respond to retrieval of an On-Demand Document Entry either through internal mechanisms or, when grouped with a Document Consumer, through interaction with appropriate XDS Actors which support On-Demand Documents. Responding Gateways which support the Persistence of Retrieved Documents Option shall specify the NewRepositoryUniqueId element indicating the document is available for later retrieval and be able to return exactly the same document in all
3385   future retrieve requests for the document identified by NewDocumentUniqueId.

3.39.4.1.3 Expected Actions

       Actors supporting this transaction shall support the Expected Actions described in the Section 3.43.4.1.3.

       The Responding Gateway shall determine the local system or systems which hold the documents
3390   requested and interact with those systems. The Responding Gateway may use a Retrieve Document Set transaction or other internally defined interaction, to retrieve the document or documents. If more than one system is contacted the Responding Gateway shall consolidate the results from the multiple systems into one response to the Initiating Gateway. If both successes and failures are received the Responding Gateway may choose to use PartialSuccess status to
3395   reflect both failure and success. The Responding Gateway may alternatively choose to suppress the failures and report only successes.

       If the Responding Gateway returns any Regitry Error elements, the Responding Gateway shall include in the location attribute all the requirements stated in Section 3.43 plus the homeCommunityId of the Responding Gateway.

3400   If the XDS Affinity Domain Option is supported, the Initiating Gateway shall, if needed, consolidate results from multiple Responding Gateways. This includes reflecting in the consolidated results returned to the originating Retrieve Document Set [ITI-43] all successes and failures received from Responding Gateways. If both successes and failures are received from Responding Gateways, the Initiating Gateway shall return both DocumentResponse and
3405   RegistryErrorList elements in one response and specify PartialSuccess status.

3.39.4.1.3.1 Compatibility of Options

       If the Initiating Gateway does not support the On-Demand Document Option, it will never send a Cross Gateway Retrieve request for an On-Demand Document. In this case, none of the attributes specific to On-Demand Documents will be included in the response.

3410   If the Initiating Gateway does support the On-Demand Document Option, it will only direct Cross Gateway Retrieve requests for On-Demand Documents to responders which have returned an On-Demand Document Entry in a Cross Gateway Query response. Thus there are no compatibility concerns with this transaction.

3.39.4.2 Cross Gateway Retrieve Response

3.39.4.2.1 Trigger Events

This message will be triggered by a Cross Gateway Retrieve Message.

3.39.4.2.2 Message Semantics

The message semantics for Cross Gateway Retrieve are the same as Retrieve Document Set. See Section 3.43.4.2.2.

3.39.4.2.3 Expected Actions

Actors supporting this transaction shall support the Expected Actions described in Section 3.43.4.2.3.

3.39.5 Protocol Requirements

The Cross Gateway Retrieve request and response will be transmitted using Synchronous or Asynchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V. The protocol requirements are identical to the Retrieve Document Set except as noted below.

Table 3.39.5-1: WSDL Namespace Definitions

soap	http://schemas.xmlsoap.org/wsdl/soap/
soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2006/05/addressing/wsdl/
xsd	http://www.w3.org/2001/XMLSchema
ihe	urn:ihe:iti:xds-b:2007
rs	urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0
lcm	urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
query	urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0

Responding Gateway: These are the requirements for the Cross Gateway Retrieve transaction presented in the order in which they would appear in the Responding Gateway WSDL definition:

- The following types shall be imported (xsd:import) in the /definitions/types section:
  - namespace="urn:ihe:iti:xds-b:2007", schema="IHEXDS.xsd"
- The /definitions/message/part/@element attribute of the Cross Gateway Retrieve Request message shall be defined as "ihe:RetrieveDocumentSetRequest"
- The /definitions/message/part/@element attribute of the Cross Gateway Retrieve Response message shall be defined as "ihe:RetrieveDocumentSetResponse"
- Refer to Table 3.39.5-2 below for additional attribute requirements

___

Table 3.39.5-2: Requirements for portType and Binding attributes

Attribute	Value
/definitions/portType/operation@name	RespondingGateway_CrossGatewayRetrieve
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2007:CrossGatewayRetrieve
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2007:CrossGatewayRetrieveResponse
/definitions/binding/operation/wsoap12:operation/@soapActionRequired	false

3440

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.43.5.1 Sample SOAP Messages.

For informative WSDL for the Responding Gateway see ITI TF-2x: Appendix W.

3445 The <ihe:RetrieveDocumentSetRequest/> element is defined in Section 3.43.5. When used within the Cross Gateway Retrieve the <ihe:HomeCommunityId/> element is required.

The <ihe:RetrieveDocumentSetResponse/> element is defined in Section 3.43.5.

3.39.5.1 Sample SOAP Messages

The samples in the following two sections show a typical SOAP request and its relative SOAP
3450 response. The sample messages also show the WS-Addressing headers <Action/>, <MessageID/>, <ReplyTo/>…; these WS-Addressing headers are populated according to the W3C WS-Addressing standard. The body of the SOAP message is omitted for brevity; in a real scenario the empty element will be populated with the appropriate metadata.

Samples presented in this section are also available online on the IHE FTP site, see ITI TF-2x:
3455 Appendix W.

3.39.5.1.1 Sample Cross Gateway Retrieve SOAP Request

3.39.5.1.1.1 Synchronous Web Services Exchange

```
<s:Envelope
3460            xmlns:s="http://www.w3.org/2003/05/soap-envelope"
            xmlns:a="http://www.w3.org/2005/08/addressing">
    <s:Header>
            <a:Action s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayRetrieve</a:Action>
            <a:MessageID>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:MessageID>
3465            <a:ReplyTo>
                    <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
            </a:ReplyTo>
            <a:To
s:mustUnderstand="1">http://localhost:2647/XcaService/IHEXCAGateway.svc</a:To>
3470    </s:Header>
        <s:Body>
                <RetrieveDocumentSetRequest xmlns="urn:ihe:iti:xds-b:2007">
                        <DocumentRequest>
                                <HomeCommunityId>urn:oid:1.2.3.4</HomeCommunityId>
```

```
3475                         <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                            <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                        </DocumentRequest>
                        <DocumentRequest>
3480                        <HomeCommunityId>urn:oid:1.2.3.5</HomeCommunityId>
                            <RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
                            <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
                        </DocumentRequest>
                    </RetrieveDocumentSetRequest>
            </s:Body>
3485    </s:Envelope>
```

3.39.5.1.1.2 Asynchronous Web Services Exchange

```
        <s:Envelope
                xmlns:s="http://www.w3.org/2003/05/soap-envelope"
                xmlns:a="http://www.w3.org/2005/08/addressing">
3490        <s:Header>
                <a:Action s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayRetrieve</a:Action>
                <a:MessageID>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:MessageID>
                <a:ReplyTo>

3495        <a:Address>http://192.168.2.4:9080/XcaService/InitiatingGatewayReceiver.svc
                    </a:Address>
                </a:ReplyTo>
                <a:To
        s:mustUnderstand="1">http://localhost:2647/XcaService/RespondingGatewayReceiver.svc</a:To>
3500        </s:Header>
            <s:Body>
                <RetrieveDocumentSetRequest xmlns="urn:ihe:iti:xds-b:2007">
                    <DocumentRequest>
                        <HomeCommunityId>urn:oid:1.2.3.4</HomeCommunityId>
3505                    <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                        <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                    </DocumentRequest>
                    <DocumentRequest>
                        <HomeCommunityId>urn:oid:1.2.3.5</HomeCommunityId>
3510                    <RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
                        <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
                    </DocumentRequest>
                </RetrieveDocumentSetRequest>
            </s:Body>
3515    </s:Envelope>
```

3.39.5.1.2 Sample Cross Gateway Retrieve SOAP Response

3.39.5.1.2.1 Synchronous Web Services Exchange

```
        <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
3520    xmlns:a="http://www.w3.org/2005/08/addressing">
            <s:Header>
                <a:Action
        s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayRetrieveResponse</a:Action>
                <a:RelatesTo>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:RelatesTo>
3525        </s:Header>
            <s:Body>
                <RetrieveDocumentSetResponse
                            xmlns="urn:ihe:iti:xds-b:2007"
                            xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
3530                        xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
                            xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
                            xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
                    <rs:RegistryResponse status="urn:oasis:names:tc:ebxml-
        regrep:ResponseStatusType:Success"/>
3535                <DocumentResponse>
```

```
                          <HomeCommunityId>urn:oid:1.2.3.4</HomeCommunityId>
                          <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                          <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                          <mimeType>text/xml</mimeType>
3540
              <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUBBNU1tQ1p0dU1GUXhEUzhi</Document>
                      </DocumentResponse>
                      <DocumentResponse>
                          <HomeCommunityId>urn:oid:1.2.3.5</HomeCommunityId>
3545                      <RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
                          <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
                          <mimeType>text/xml</mimeType>

              <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUBBNU1tQ1p0dU1GUXhEUzhi</Document>
3550                      </DocumentResponse>
                  </RetrieveDocumentSetResponse>
              </s:Body>
      </s:Envelope>
```

3.39.5.1.2.2 Asynchronous Web Services Exchange

```
3555  <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
      xmlns:a="http://www.w3.org/2005/08/addressing">
          <s:Header>
              <a:Action
      s:mustUnderstand="1">urn:ihe:iti:2007:CrossGatewayRetrieveResponse</a:Action>
3560              <a:MessageID>urn:uuid:D6C21225-8E7B-454E-9750-821622C099DB</a:MessageID>
              <a:RelatesTo>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:RelatesTo>
              <a:To
      s:mustUnderstand="1">http://localhost:2647/XcaService/InitiatingGatewayReceiver.svc</a:To>
          </s:Header>
3565      <s:Body>
              <RetrieveDocumentSetResponse
                          xmlns="urn:ihe:iti:xds-b:2007"
                          xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
                          xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
3570                      xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
                          xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
                  <rs:RegistryResponse status="urn:oasis:names:tc:ebxml-
      regrep:ResponseStatusType:Success"/>
                  <DocumentResponse>
3575                      <HomeCommunityId>urn:oid:1.2.3.4</HomeCommunityId>
                          <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                          <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                          <mimeType>text/xml</mimeType>

3580          <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUBBNU1tQ1p0dU1GUXhEUzhi</Document>
                      </DocumentResponse>
                      <DocumentResponse>
                          <HomeCommunityId>urn:oid:1.2.3.5</HomeCommunityId>
                          <RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
3585                      <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
                          <mimeType>text/xml</mimeType>

              <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUBBNU1tQ1p0dU1GUXhEUzhi</Document>
                      </DocumentResponse>
3590              </RetrieveDocumentSetResponse>
              </s:Body>
      </s:Envelope>
```

3.39.6 Security Considerations

3595 Both the Initiating Gateway and Responding Gateway shall audit the Cross Gateway Retrieve. The audit entries shall be equivalent to the entries required for the Retrieve Document Set.

The Initiating Gateway:

- If receiving a Retrieve Document Set transaction from a Document Consumer, shall audit as if it were a Document Repository (see Section 3.43.6).

3600 - In addition, shall audit the Cross Gateway Retrieve as if it were a Document Consumer except that for EventTypeCode the Initiating Gateway shall specify EV("ITI-39", "IHE Transactions", and "Cross Gateway Retrieve") (see Section 3.43.6).

- In addition, if interacting with a local Document Repository, shall audit as if it were a Document Consumer (see Section 3.43.6). One audit record shall be created for each
3605 Document Repository contacted.

The Responding Gateway:

- Shall audit the Cross Gateway Retrieve as if it were a Document Repository except that for EventTypeCode the Responding Gateway shall specify EV("ITI-39", "IHE Transactions", "Cross Gateway Retrieve") (see Section 3.43.6).

3610 - In addition, if interacting with a local Document Repository, shall audit as if it were a Document Consumer (see Section 3.43.6). One audit record shall be created for each Document Repository contacted.

3.40 Provide X-User Assertion [ITI-40]

3615 This section corresponds to transaction ITI-40 of the IHE IT Infrastructure Technical Framework.

3.40.1 Scope

Transaction ITI-40 is used by the **X-Service User** to pass a claimed identity assertion to the **X-Service Provider**. The **X-Service User** and **X-Service Provider** use the **X-Assertion Provider**
3620 as the third party issuer of the claimed identity assertion.

3.40.2 Use Case Roles
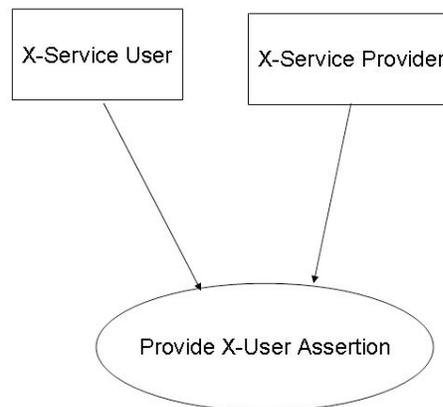
Actor: X-Service User

3625 **Role:** User of a transaction that requires a Cross-Enterprise User Assertion

Actor: X-Service Provider

Role: Service provider on a transaction that requires a Cross-Enterprise User Assertion

3.40.3 Referenced Standards

3.40.3.1 Normative -- required to use this transaction

3630 • OASIS http://www.oasis-open.org/committees/security/.

  • SAMLCore SAML V2.0 Core standard

  • WSS10 OASIS Standard, "OASIS Web Services Security: SOAP Message Security 1.0 (WS-Security 2004)", March 2004.

  • WSS11 OASIS Standard, "OASIS Web Services Security: SOAP Message Security 1.1
3635 (WS-Security 2004)", February 2006.

- WSS:SAMLTokenProfile1.0 OASIS Standard, "Web Services Security: SAML Token Profile", December 2004

- WSS:SAMLTokenProfile1.1 OASIS Standard, "Web Services Security: SAML Token Profile 1.1", February 2006

3640
- XSPA-SAMLv1.0 OASIS Standard, "Cross-Enterprise Security and Privacy Authorization (XSPA) Profile of the Security Assertion Markup Language (SAML) for Healthcare v1.0" , November 2009

- SAML 2.0 Profile For XACML 2.0 OASIS Standard, February 2005

3.40.3.2 Informative -- assist with understanding or implementing this transaction

3645
- IHE Profiles

  - Personnel White Pages Profile

  - Enterprise User Authentication Profile

  - Basic Patient Privacy Consents Profile

- OASIS

3650
  - SAML V2.0 Standards http://www.oasis-open.org/committees/security/.

  - SAML V2.0 Technical Overview

  - SAML Executive Overview

  - SAML Tutorial presentation by Eve Maler of Sun Microsystems

  - SAML Specifications

3655
  - WS-Trust - OASIS Web Services Secure Exchange (WS-SX) TC

  - XSPA-XACMLv1.0 OASIS Standard, "Cross-Enterprise Security and Privacy Authorization (XSPA) Profile of XACML v2.0 for Healthcare v1.0" , November 2009

3.40.4 Interaction Diagram
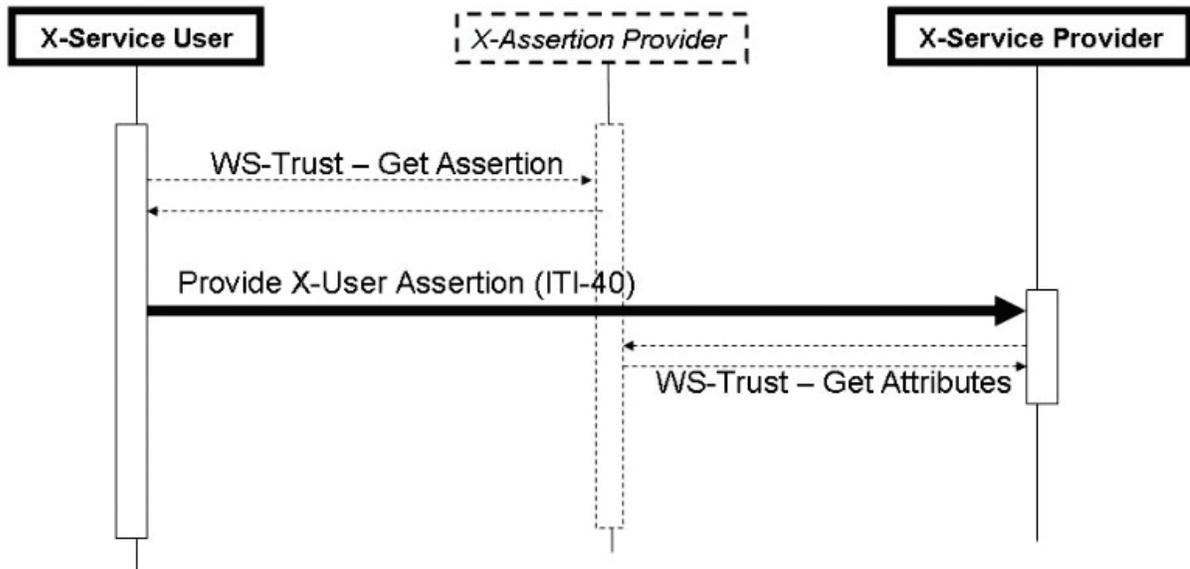
3660

Figure 3.40.1-1: X-User Assertion Messages

3.40.4.1 Provide X-User Assertion

The Provide X-User Assertion is profiled to assure interoperability between an X-Service User and an X-Service Provider that need an Assertion about the entity requesting the service. There 3665 are many ways to provide an Assertion that are all acceptable and may be used by parties that have agreed to their use.

The Provide X-User Assertion transaction sets some minimal interoperability profiling for this use-case. The Provide X-User Assertion transaction shall be used when there is no other agreed upon policy that would assure User Assertion interoperability (e.g., WS-SecurityPolicy).

3670 #### 3.40.4.1.1 Trigger

Configuration of the X-Service Provider and X-Service User indicates when the X-User Assertion transaction is necessary.

3.40.4.1.2 Message Semantics

The X-User Assertion must be protected at all times against confidentiality exposure, malicious 3675 modification, and trust relationship between those communicating it. The IHE Actors that are grouped with XUA may already require IHE-ATNA and thus TLS Mutual-Authentication, Integrity, and Confidentiality.

The X-Service User shall include the OASIS Web Services Security (WSS) Header, and shall include a SAML 2.0 Assertion as the security token.

3680   Any ATNA Audit Messages that the X-Service User records in relationship to a transaction protected by the XUA (e.g., XDS.b Registry Stored Query, and XDS.b Retrieve Document Set), shall have the user identity recorded according to the XUA specific ATNA encoding rules (See Section 3.40.4.2 ATNA Audit encoding). This assures that the X-Service User and X-Service Provider ATNA Audit messages can be correlated at the ATNA Audit Record Repository.

3685   Any ATNA Audit Messages recorded by actor grouped with the X-Service User Actor, shall have the user identity recorded according to the XUA specific ATNA encoding rules (See Section 3.40.4.2 ATNA Audit encoding). For example: The XDS.b Document Consumer records the Query event, this event record will include the identity provided in the XUA Identity Assertion. This assures that the X-Service User and X-Service Provider ATNA Audit messages

3690   can be correlated at the ATNA Audit Record Repository.

The SAML 2.0 **Assertion** is profiled as follows (**bold** is used when SAML 2.0 terms are used):

- The Assertion shall contain a **Subject**. The Subject contains the logical identifier of the principal performing the original service request (person, application, etc.) and remains unchanged through operations acting on the assertion (e.g., proxying the Assertion).

3695
- The **Subject** shall contain a **SubjectConfirmation** element. The bearer confirmation method shall be supported; the holder-of-key method may be supported. These methods are defined in the SAML 2.0 Profile specification, Section 3.

- The SAML Assertion **Conditions** are profiled as:

  - **NotBefore** shall be populated with the issue instant of the Assertion

3700
  - **NotOnOrAfter** is not specified by XUA because reasonable time limits are not clear at the IHE Profile level. The Expiration is provided by the X-Assertion Provider and would be variable on an Affinity Domain and/or System level.

  - The assertion shall contain an **AudienceRestriction** containing an **Audience** whose value is a URI identifying the X-Service Provider (e.g., XDS Registry, XDS

3705   Repository). It may contain an Audience whose value is a URI identifying the Affinity Domain.

  - The Assertion may contain **ProxyRestriction** and **OneTimeUser** conditions but XUA Actors may ignore these conditions.

- The Assertion shall contain an AuthnStatement specify the AuthnContextClassRef or

3710   AuthnContextDeclRef

- The Assertion may contain other statements (e.g., Attributes) The <AttributeStatement> element describes a statement by the SAML authority asserting that the requesting user is associated with the specified attributes. When Local Policy requires that the following attributes are carried in the SAML assertion then they should be encoded as follows:

3715
  - Subject ID : The value on the Subject ID attribute shall be a plain text description of the user's name (not user ID).

- This <Attribute> element shall have the Name attribute set to "urn:oasis:names:tc:xspa:1.0:subject:subject-id". The name of the user shall be placed in the value of the <AttributeValue> element. (Keep in mind that the term "subject" in SAML and XACML refers to the individual making the request; in this specification, the term "User" is generally used with the same meaning, but when referring to attributes defined in SAML or XACML, the naming convention of the standard is retained.)

```
<saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:subject-id">
  <saml:AttributeValue>Walter H.Brattain IV</saml:AttributeValue>
</saml:Attribute>
```

- Subject Organization : The value on Subject Organization attribute shall be a plain text description of the organization.

  - This <Attribute> element shall have the Name attribute set to "urn:oasis:names:tc:xspa:1.0:subject:organization". In plain text, the organization that the user belongs to shall be placed in the value of the <AttributeValue> element.

```
<saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:organization">
  <saml:AttributeValue>Family Medical Clinic</saml:AttributeValue>
</saml:Attribute>
```

  - Subject Organization ID Attribute

    - This <Attribute> element shall have the Name attribute set to "urn:oasis:names:tc:xspa:1.0:subject:organization-id" A unique identifier for the organization that the user is representing in performing this transaction shall be placed in the value of the <AttributeValue> element. This organization ID shall be consistent with the plain-text name of the organization provided in the User Organization Attribute. The organization ID may be an Object Identifier (OID), using the urn format (that is, "urn:oid:" appended with the OID); or it may be a URL assigned to that organization.

```
<saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:organization-id">
  <saml:AttributeValue>http://familymedicalclinic.org</saml:AttributeValue>
</saml:Attribute>
```

  - Home Community ID Attribute

    - This <Attribute> element shall have the Name attribute set to "urn:ihe:iti:xca:2010:homeCommunityId". The value shall be the Home Community ID (an Object Identifier) assigned to the Community that is initiating the request, using the urn format (that is, "urn:oid:" appended with the OID).

```
<saml:Attribute Name="urn:ihe:iti:xca:2010:homeCommunityId">
  <saml:AttributeValue>urn:oid:2.16.840.1.113883.3.190</saml:AttributeValue>
</saml:Attribute>
```

  - National Provider Identifier (NPI) Attribute

    - A National Provider Identifier (NPI) is a unique identifier issued to health care providers by their national authority. (e.g., in the United States this is a 10-digit number assigned by the Centers for Medicare and Medicaid Services (CMS)).

3760 This attribute provides the ability to specify an NPI value as part of the SAML assertion that accompanies a message. When a simple string is used there needs to be a mutually agreed upon assigning authority. The Other Provider Identifier Attribute can be used to explicitly show the assigning authority (See use in the Other Provider Identifier Attribute below).

3765 *Note: Usage of a HL7 CE type in this attribute is permitted for backward compatibility.*

- This <Attribute> element SHALL have the Name attribute set to "urn:oasis:names:tc:xspa:1.0:subject:npi". An example of the syntax of this element follows:

3770
```
<saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:npi">
  <saml:AttributeValue>1234567890</saml:AttributeValue>
</saml:Attribute>
```

- Other Provider Identifier Attribute

  - A unique identifier issued to health care providers by a named authority. This 3775 <Attribute> may be repeated.

  - This <Attribute> element SHALL have the Name attribute set to "urn:ihe:iti:xua:2017:subject:provider-identifier". The value of the <AttributeValue> element is a child element, "id", in the namespace "urn:hl7-org:v3", whose content is defined by the "II" (instance identifier) data type from 3780 the HL7 version 3 abstract data type specification. The "id" element must contain a "root" attribute and an "extension" attribute. It may also contain an "assigningAuthorityName" attribute and a "displayable" attribute. The "root" attribute shall contain an OID identifying the authority issuing the provider identifier. The "extension" attribute shall contain the provider identifier itself. The 3785 "assigningAuthorityName" attribute may be used to include a human readable name for the assigning authority identified by the "root" attribute. The "displayable" attribute may be included to signal that the the identifier is human readable (if set to "true") or intended for machine reading (if set to "false"). An example of the syntax of this element follows:

3790
```
<saml:Attribute Name="urn:ihe:iti:xua:2017:subject:provider-identifier">
  <saml:AttributeValue>
    <id xmlns="urn:hl7-org:v3" xsi:type="II" extension="1234567890"
       root="2.999.1.2.3.4.5" assigningAuthorityName="Example Authority"
       displayable="true"/>
3795  </saml:AttributeValue>
</saml:Attribute>
```

- The Assertion may contain other statements (e.g., Attributes)

- The Assertion shall be signed by the X-Assertion Provider as defined in SAML Core.

The interface between the X-Service User and the X-Assertion Provider is not specified by 3800 XUA. This interface needs to be protected against risks (e.g., exposure of the SAML Token to

interception for malicious use). Assertions need to be carefully managed in the X-Service User to ensure they are not exposed in the application code or any subsequent use of the Assertion.

3.40.4.1.2.1 Subject-Role Option

3805   When the Subject-Role Option is used the X-Service User shall encode the relevant user subject roles from a locally defined Code-Set into subject role <Attribute> element(s). The Subject-Role values communicated are assertions from the X-Service User perspective.

The subject role <Attribute> element shall have the Name attribute set to "urn:oasis:names:tc:xacml:2.0:subject:role". The value of the <AttributeValue> element is a child element, "Role", in the namespace "urn:hl7-org:v3", whose content is defined by the "CE"
3810   (coded with equivalents) data type from the HL7 version 3 specification. The code attribute shall contain the role code from the identified Value-Set that represents the role that the XUA user is playing when making the request. The displayName attribute may be used to include a human readable representation of the role code. The codeSystem attribute shall contain the OID of the coding system that the role code was taken from. The codeSystemName attribute shall identify
3815   the name of the coding system. No other parts of the CE data type shall be used. The following is an example of the syntax of this element:

```
<saml:Attribute Name="urn:oasis:names:tc:xacml:2.0:subject:role">
 <saml:AttributeValue>
  <Role xmlns="urn:hl7-org:v3" xsi:type="CE" code="46255001"
   codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED_CT"
   displayName="Pharmacist"/>
 </saml:AttributeValue>
</saml:Attribute>
```

3825

3.40.4.1.2.2 Authz-Consent Option

When the Authz-Consent Option is supported and a policy identifier needs to be sent, the X-Service User shall include the document unique ID of the *Patient Privacy Policy Acknowledgement Document* or include the Patient Privacy Policy Identifier for a policy that has
3830   been previously published encoded as SAML attributes.

A *Patient Privacy Policy Acknowledgement Document* unique ID shall be encoded as a SAML attribute in the IHE ITI namespace, "urn:ihe:iti:bppc:2007:docid", with name format "urn:oasis:names:tc:SAML:2.0:attrname-format:uri". Access to the content is not specified. Access through an XDS/XCA/XDR/XDM mechanism is a potential approach. Similarly, this
3835   option does not specify how the policy documents should be used to make access control decisions. A sample attribute fragment is given in Figure 3.40-2.

```
<saml2:Attribute FriendlyName="Patient Privacy Policy Acknowledgement Document"
    Name="urn:ihe:iti:bppc:2007:docid"
    NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
     <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

3840

```
                xsi:type="xs:anyURI">urn:oid:1.2.3.xxx</saml2:AttributeValue>
</saml2:Attribute>
```

3845

Figure 3.40-2: Sample attribute holding a reference to patient acknowledgement

A Patient Privacy Policy Identifier shall be encoded as a SAML attribute in the IHE ITI
namespace, "urn:ihe:iti:xua:2012:acp", with name format
``urn:oasis:names:tc:SAML:2.0:attrname-format:uri''. The policy identifier shall be expressed

3850 using the xs:anyURI data type. The referenced policy identifier is the OID of a published policy.
Access to this policy is not specified further. A sample is given in Figure 3.40-3.

```
<saml2:Attribute FriendlyName="Patient Privacy Policy Identifier"
     Name="urn:ihe:iti:xua:2012:acp"
     NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
      <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="xs:anyURI">urn:oid:1.2.3.yyyy</saml2:AttributeValue>
</saml2:Attribute>
```

3855

3860 **Figure 3.40-3: Sample attribute holding a reference to a privacy policy**

3.40.4.1.2.2.1 Patient Identifier Attribute

This attribute is *optional,* as it may not be needed for cases in which the data being exchanged
does not pertain to a specific patient (e.g., population health data). The value of the Patient
Identifier attribute is recommended when the InstanceAccessConsentPolicy attribute is specified

3865 in an Authorization Decision Statement.

This <Attribute> element shall have the Name attribute set to:

"urn:oasis:names:tc:xacml:2.0:resource:resource-id".

The patient identifier of the requesting organization shall be placed in the value of the
<AttributeValue> element. The patient identifier shall consist of two parts; the OID for the

3870 assigning authority and the identifier of the patient within that assigning authority. The value
shall be formatted using the CX syntax. As an example, a patient identifier of 543797436 for an
assigning authority with an OID of 1.2.840.113619.6.197, has been encoded into the follow
SAML assertion snippet. Please note that the '&' character has been properly encoded in the
XML content in the following example.

3875

```
<saml:Attribute Name="urn:oasis:names:tc:xacml:2.0:resource:resource-id">

<saml:AttributeValue>543797436^^^&amp;1.2.840.113619.6.197&amp;ISO</saml:AttributeValu
e>
</saml:Attribute>
```

3880

3.40.4.1.2.3 PurposeOfUse Option

The PurposeOfUse <Attribute> element shall have the Name attribute set to "urn:oasis:names:tc:xspa:1.0:subject:purposeofuse". The value of the <AttributeValue> element
3885 is a child element, "PurposeOfUse", in the namespace "urn:hl7-org:v3", whose content is defined by the "CE" (coded element) data type from the HL7 version 3 specification.

The PurposeOfUse element shall contain the coded representation of the Purpose for Use that is in effect for the request.

An example of the syntax of this element is as follows:

3890
```
<saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:purposeofuse">
  <saml:AttributeValue>
    <PurposeOfUse xmlns="urn:hl7-org:v3" xsi:type="CE" code="12"
        codeSystem="1.0.14265.1"
3895 codeSystemName="ISO 14265 Classification of Purposes for processing personal health
information"
        displayName="Law Enforcement"/>
  </saml:AttributeValue>
</saml:Attribute>
```

3900

Codes are assigned by the local Security Domain and a Code-Set needs to be managed. A good source Vocabulary for PurposeOfUse is ISO 14265 – Health Informatics – Classification of purposes for processing personal health information. The Value-Set used may include local codes or codes drawn from formal vocabulary.

3905 The value of the Purpose of Use attribute shall be a urn:hl7-org:v3:CE element, specifying the coded value representing the user's purpose in issuing the request, choosing from the value set given by local Policy. The codeSystem attribute of this element must be present, and must specify the OID of the "Purpose of Use" code system.

3.40.4.1.2.3.1 ATNA encoding of PurposeOfUse

3910 When the PurposeOfUse Option is used the X-Service User and X-Service Provider SHALL place the PurposeOfUse value into the ATNA Audit Message associated with the transaction according to the Record Audit Event [ITI-20] transaction (see ITI TF-2a: 3.20.7.1.2).

3.40.4.1.3 Expected Actions

The X-Service Provider shall validate the Identity Assertion by processing the Web-Services
3915 Security header in accordance with the Web-Services Security Standard, and SAML 2.0 Standard processing rules (e.g., check the digital signature is valid and chains to an X-Identity Provider that is configured as trusted). If this validation fails, then the grouped Actor's associated transaction shall return with an error code as described in WS-Security core specification Section 12 (Error Handling, using the SOAP Fault mechanism), and the ATNA Audit event for
3920 Authentication Failure shall be recorded according to ATNA rules.

Any ATNA Audit Messages recorded by actor grouped with the X-Service Provider Actor, shall have the user identity recorded according to the XUA specific ATNA encoding rules (see Section 3.40.4.2 ATNA Audit encoding). For example: The XDS.b Document Consumer performing a Registry Stored Query records the Query event; this event record will include the identity provided in the XUA Identity Assertion. This assures that the X-Service User and X-Service Provider ATNA Audit messages can be correlated at the ATNA Audit Record Repository.

The X-Service Provider may use standards transactions to communicate with the X-Assertion Provider (e.g., WS-Trust, SAML 2.0 Protocol) to obtain information not included in the assertion provided (e.g., Attributes that might be related to structural roles).

The X-Service Provider may utilize the identity in access control decisions. Appropriate error messages, not defined here, shall be returned. The X-Service Provider may ignore any other statements (e.g., Attributes).

The X-Service Provider may use the authentication class references to determine the method that was used to authenticate the user. For example the X-Service Provider may have a configurable list of authentication class references that it is willing to recognize as authentication methods that are acceptable, thus treating other authentication class references as not authorized.

Assertions need to be carefully managed inside the X-Service Provider to ensure they are not exposed in the application code or any subsequent use of the Assertion.

3.40.4.1.3.1 Subject-Role Option

When the Subject-Role Option is used, the X-Service Provider may utilize the Subject-Role values in local policy for access control decision making.

The X-Service Provider may need to bridge the Subject-Role values into local role vocabulary.

The Subject-Role may be used to populate the ATNA Audit Message.

3.40.4.1.3.2 Authz-Consent Option

When the Authz-Consent Option is used, the X-Service Provider may utilize the Authz-Consent values in local policy for access control decision making. The Authz-Consent values are offered by the X-Service User as an indicator of the specific consent or authorization that the X-Service User has determined authorizes the transaction. The values are informative to the X-Service Provider which may choose to ignore the values.

This may require the X-Service Provider to lookup the metadata by reference to the values given, and may require the X-Service Provider to retrieve the consent documents.

The Authz-Consent value may be used to populate the ATNA Audit Message.

3.40.4.1.3.3 PurposeOfUse Option

When the PurposeOfUse Option is used the X-Service Provider SHALL place the PurposeOfUse into the ATNA Audit Message associated with the transaction (see Section 3.40.4.1.2.3.1). This

PurposeOfUse in the audit log can be used at the Audit Record Repository to inform reporting such as Accounting of Disclosures or Breach Notifications. The X-Service Provider MAY use the PurposeOfUse value in Access Control decisions.

3960 **3.40.4.2 ATNA Audit encoding**

When an ATNA Audit message needs to be generated and the user is authenticated by way of an X-User Assertion, the ATNA Audit message **UserName** element shall record the X-User Assertion using the following encoding:

alias"<"user"@"issuer">"

3965 where:

- **alias** is the optional string within the SAML Assertion's Subject element SPProvidedID attribute

- **user** is the required content of the SAML Assertion's Subject element

- **issuer** is the X-Assertion Provider entity ID contained with the content of SAML
3970 Assertion's Issuer element

3.40.4.3 Informative Material on WS-Trust

If the X-Service Provider uses WS-Trust in order to obtain a SAML assertion from an X-Identity Provider, it is suggested to use the version 1.3 of the WS-Trust specification, as described in [WS-Trust].

3975

3.41 Provide and Register Document Set-b [ITI-41]

This section corresponds to Transaction [ITI-41] of the IHE Technical Framework. Provide and Register Document Set-b is used to transmit a set of documents and associated metadata. The documents and metadata might be stored for later retrieval or processed in some other way depending on the actor and workflow using the transaction.

3.41.1 Scope

The Provide and Register Document Set-b transaction passes a Document Submission Request (see ITI TF-3: 4.2.1.5) from a Content Sender to a Content Receiver.

3.41.2 Actor Roles

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

Table 3.41.2-1: Actor Roles

Role:	**Content Sender**: A system that submits documents and associated metadata to a Content Receiver.
Actor(s):	The following actors may play the role of Content Sender: Document Source, Metadata-Limited Document Source
Role:	**Content Receiver**: A system that receives a set of documents and associated metadata.
Actor(s):	The following actors may play the role of Content Receiver: Document Repository, Document Recipient

Transaction text specifies behavior for each Role. The behavior of specific Actors may also be specified when it goes beyond that of the general Role.

3.41.3 Referenced Standards

ebRIM	OASIS/ebXML Registry Information Model v3.0
	This model defines the types of metadata and content that can be stored in an ebXML Registry, a basis for and subset of Document Sharing metadata.
ebRS	OASIS/ebXML Registry Services Specifications v3.0
	This defines the services and protocols for an ebXML Registry, used as the basis for the XDS Document Registry
MTOM	SOAP Message Transmission Optimization Mechanism http://www.w3.org/TR/soap12-mtom/
	This is a method for optimizing the transmission and/or wire format of SOAP messages.
XOP	XML-binary Optimized Packaging http://www.w3.org/TR/2005/REC-xop10-20050125/
	This is a means of more efficiently of converting an XML Infoset with certain types of content into a stream of bytes for transmission.

> See ITI TF-2x: Appendix V for other referenced standards for SOAP encoding.
> See ITI TF-3: 4.2 for other referenced standards for metadata element encoding.

3.41.4 Interaction Diagrams
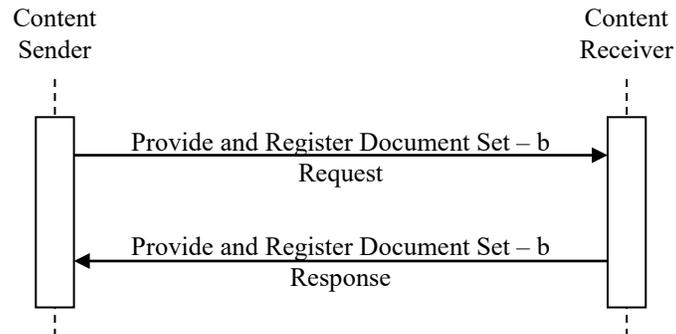
3.41.4.1 Provide and Register Document Set-b Request

3995

The Provide and Register Document Set-b Request message is used to send patient specific healthcare information as a set of documents and associated metadata. Metadata enables the receiver to process the content of the message programmatically, without needing to understand the format or contents of the documents. For more details about metadata in the context of Document Sharing, see ITI TF-3: 4.

4000

A Content Sender sends documents and associated metadata to a Content Receiver.

3.41.4.1.1 Trigger Events

The Content Sender, based on a human decision or the application of a certain rule of automatic operation, wants to submit document-related information to a Content Receiver.

4005

3.41.4.1.2 Message Semantics

The Provide and Register Document Set-b Request message shall use SOAP 1.2 and MTOM with XOP encoding (labeled MTOM/XOP in this specification). Implementors of this transaction shall comply with all requirements described in: ITI TF-2x: Appendix V: Web Services for IHE Transactions.

4010

The use of MTOM/XOP is governed by the following rules:

- The Content Sender shall generate the Provide and Register Document Set-b Request message in MTOM/XOP format.

- The Content Receiver shall accept documents in a Provide and Register Document Set-b Request message in MTOM/XOP format.

4015 The Provide and Register Document Set-b request message shall contain a Submission Request, as defined in ITI TF-3: 4.1.4, and may contain documents. See ITI TF-3: 4.2.1.4 for a description of the ebRS/ebRIM representation of a Submission Request. The metadata requirements for this Submission Request are defined in ITI TF-3: 4.3.1. The Submission Request shall contain exactly one DocumentEntry object for each Document contained in the request message, and

4020 vice versa.

All DocumentEntry objects in this Submission Request shall be Stable DocumentEntry objects and, therefore, will not be On-Demand DocumentEntry objects. Associations included in the Submission Request may reference On-Demand DocumentEntry objects that have been registered previously.

4025 The sections in ITI TF-3: 4.1 specify the mapping of XDS concepts to ebRS and ebRIM semantics and document metadata. A full example of document metadata submission can be found in ITI TF-2x: Appendix W.

XML namespace prefixes used in text and examples below are for informational purposes only and are documented in ITI TF-2x: Appendix V, Table V.2.4-1.

4030 The requirements for the request message are:

- the Content-Type HTTP header shall have an action parameter with the value urn:ihe:iti:2007:ProvideAndRegisterDocumentSet-b

- the <wsa:Action> SOAP element shall contain the value urn:ihe:iti:2007:ProvideAndRegisterDocumentSet-b

4035 - the <soap12:Body> shall contain one <xds:ProvideAndRegisterDocumentSetRequest> element

- the <xds:ProvideAndRegisterDocumentSetRequest> element shall contain:

  - one <lcm:SubmitObjectsRequest> element representing the Submission Request (see ITI TF-3: 4.2.1.4 for details of expressing a Submission Request).

4040 - one <xds:Document> element for each <rim:ExtrinsicObject> contained in the <lcm:SubmitObjectsRequest>

  - the <xds:Document> element shall:

    - have an @id attribute whose value matches the value of the corresponding rim:ExtrinsicObject/@id

4045 - contain the document using the xsi:base64Binary data type (Note: This is the logical representation of the document in the XML. The wire format may be different; see ITI TF-2x: Appendix V.8)

A full XML Schema Document for the XDS types is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

4050 Below is an example of the SOAP Body for a Provide and Register Document Set-b Request message

```
        <soap12:Body>
           <xds:ProvideAndRegisterDocumentSetRequest>
4055          <lcm:SubmitObjectsRequest>
                 <!-- Submission Request contents - See ITI TF-3: 4.2.1.4 -->
                 <rim:RegistryObjectList>

4060              <!-- Registry Metadata goes here -->

                 </rim:RegistryObjectList>
              </lcm:SubmitObjectsRequest>
              <xds:Document id="Document01">SGVyZSBpcyBteSBkb2N1bWVudA==</xds:Document>
           </xds:ProvideAndRegisterDocumentSetRequest>
4065       </soap12:Body>
```

3.41.4.1.2.1 XDS Document Source Options

The XDS Document Source may choose to support options which are listed in ITI TF-1: Table
10.2-1b and described in the sections that follow it.

4070   If the XDS Document Source supports the Document Replacement Option, it shall be able to
generate replace semantics as defined in ITI TF-3: 4.2.2.2.3.

If the XDS Document Source supports the Document Addendum Option, it shall be able to
generate append semantics as defined in ITI TF-3: 4.2.2.2.1.

If the XDS Document Source supports the Document Transformation Option, it shall be able to
4075   generate transformation semantics as defined in ITI TF-3: 4.2.2.2.2.

If the XDS Document Source supports the Folder Management Option, it shall be able to
generate folder semantics as defined in ITI TF-3: 4.2.1.3 and ITI TF-3: 4.2.2.1.5.

If the XDS Document Source supports the Asynchronous Web Services Exchange Option, it
shall be able to generate an Asynchronous Web Services request as defined in ITI TF-2x:
4080   Appendix V.5.

Refer to ITI TF-1: 10.2.9 for support of the Basic Patient Privacy Enforcement Option.

3.41.4.1.3 Expected Actions

Upon receipt of a Provide and Register Document Set-b request, the Content Receiver shall
process the request.

4085   If a failure is detected during processing, the Content Receiver shall return an error response to
the Content Sender, thus terminating this transaction; otherwise, the Content Receiver shall
return a success response to the Content Sender. The various exception conditions and possible
error or warning messages are given in the ebRS standard and in ITI TF-3: 4.2.4 Success and
Error Reporting.

4090   The Content Receiver shall be capable of accepting submissions containing multiple documents.

Note: The Content Sender may submit single documents or multiple documents depending on its needs.

A Content Receiver shall verify the received metadata as follows. For each DocumentEntry, the Content Receiver shall:

- Verify the hash attribute, if present. If a received hash value differs from the calculated hash of the received document, the Content Receiver shall reject the submission and return an XDSRepositoryMetadataError error.

- Verify the size attribute, if present. If a received size value differs from the octet count of the received document, the Content Receiver shall reject the submission and return an XDSRepositoryMetadataError error.

Also, for the SubmissionSet, the Content Receiver may:

- Validate the sourceId. If the submission is not from a permitted Content Sender, the submission may be rejected and an error returned.

3.41.4.1.3.1 Document Recipient Expected Actions

In addition to the Expected Actions of all Content Receivers (described in the beginning of Section 3.41.4.1.3), a Document Recipient shall meet the following requirements.

A Document Recipient shall be able to interpret a submission without any context, such as knowledge of a prior submission.

The Document Recipient may validate the presence of metadata attributes. If the Document Recipient declares the Accepts Limited Metadata Option and the limitedMetadata attribute is present, such validation shall not exceed the requirements in the column labeled "XDR MS" (XDR Metadata-Limited Document Source) of ITI TF-3: Table 4.3.1-3. Otherwise, such validation shall not exceed the requirements in the column labeled "XDR DS" (XDR Document Source) of ITI TF-3: Table 4.3.1-3.

The following shall not cause rejection of a submission:

- The submitted metadata includes Folders, and the Document Recipient cannot process the Folder-specific content. The response shall contain a PartialFolderContentNotProcessed warning and a textual description that Folder Content was not processed.

- The submitted metadata includes document relationships, and the Document Recipient cannot process the relationship-specific content. For each unsupported association, the response shall contain a warning and textual description that the relationship semantics were not processed. The specific warning depends on the relationship: PartialAppendContentNotProcessed, PartialReplaceContentNotProcessed, PartialTransformContentNotProcessed, or PartialTransformReplaceContentNotProcessed.

The received documents may be processed further according to the capabilities of the system. These capabilities are not specified by IHE.

3.41.4.1.3.2 Document Repository Expected Actions

In addition to the Expected Actions of all Content Receivers (described at the beginning of Section 3.41.4.1.3), a Document Repository shall meet the following requirements.

4130   On receipt of a Provide and Register Document Set-b [ITI-41] request, the Document Repository shall, in order:

1. Validate and update select received metadata, as detailed below.

2. Make any received documents available for retrieval via the Retrieve Document Set [ITI-43] transaction.

4135   3. Convey the updated metadata to the Document Registry via a Register Document Set-b [ITI-42] request.

4. Issue a Provide and Register Document Set-b [ITI-41] response.

If any error is encountered during processing of this request, either at the Document Repository or reported by the Document Registry, the Document Repository may revert any changes to the
4140   Document Repository data store. The Document Repository shall then terminate processing the transaction, and return an error response.

Before issuing the Register Document Set-b [ITI-42] transaction, the Document Repository shall update the received metadata as follows. For each received DocumentEntry, the Document Repository shall:

4145   • Add or replace the repositoryUniqueId attribute. The emitted value shall identify the Document Repository for retrieval of the received document.

• Add a hash attribute if not present. The emitted value shall be the SHA1 hash of the received document.

• Add a size attribute if not present. The emitted value shall be the octet count of the
4150   received document.

The Document Repository may add additional fields.

For each received DocumentEntry, the Document Repository may validate the uniqueId attribute. The submission may be rejected and an error returned if the uniqueId attribute matches a document within the Document Repository and the sizes or hashes of the two documents differ.
4155   The specific error returned depends on which attribute differed (XDSNonIdenticalSize or XDSNonIdenticalHash). The Document Repository shall not generate an error related to duplication if the uniqueId attribute matches a document within the Document Repository and the sizes and hashes of the two documents are the same. (The document may still be rejected by the Document Registry; see Section 3.42.4.1.4.)

4160   Except as outlined above (and in Section 3.41.4.1.3 Content Receiver Expect Actions), the Document Repository shall not validate the presence or content of received metadata attributes.

The Document Repository shall make received documents available for retrieval via the Retrieve Document Set [ITI-43] transaction. If the document's uniqueId is already known to the Document Repository, no action is required. Otherwise, the Document Repository shall:

4165
- Store the received document octet stream

- Store the received DocumentEntry mimeType and uniqueId, and associate them with the received document octet stream.

Making the document retrievable before registering is necessary since a Document Registry may validate storage of a document before issuing the Register Document Set-b response; or, a
4170 Document Consumer may attempt to retrieve a document before the Register Document Set-b response is received.

The Document Repository shall issue a Register Document Set-b [ITI-42] request to the Document Registry with the (updated) received metadata. If the Register Document Set-b [ITI-42] response includes any errors or warnings, the Document Repository shall include all such
4175 errors and warnings in the Provide and Register Document Set-b [ITI-41] response.

3.41.4.2 Provide and Register Document Set-b Response

The Content Receiver shall send a Provide and Register Document Set-b Response message when the processing of a Provide and Register Document Set-b Request is complete.

3.41.4.2.1 Trigger Events

4180 The request message has been received and processed by the Content Receiver

3.41.4.2.1.1 Document Repository Trigger Events

The Document Repository shall send the Provide and Register Document Set-b Response after receipt of the response to the corresponding Register Document Set-b [ITI-42] transaction from the Document Registry.

4185
- If the response to the Register Document Set-b [ITI-42] transaction indicates success, then the Document Repository shall send a successful response message.

- If the response to the Register Document Set-b [ITI-42] transaction indicates failure, then the Document Repository shall send a failure response message.

3.41.4.2.2 Message Semantics

4190 The Provide and Register Document Set-b Response message shall use SOAP 1.2 and MTOM with XOP encoding (labeled MTOM/XOP in this specification). Implementors of this transaction shall comply with all requirements described in: ITI TF-2x: Appendix V: Web Services for IHE Transactions.

The use of MTOM/XOP is governed by the following rules:

4195
- The Content Receiver shall generate the Provide and Register Document Set-b Response message in MTOM/XOP format, even though there is no base64Binary content included.

- The Content Sender shall accept the Provide and Register Document Set-b Response message in MTOM/XOP format.

The Provide and Register Document Set-b Response message shall carry the status of the requested operation. The response message may carry warning messages. If the requested operation fails, the response message shall carry at least one error message. The conditions of failure and possible warning and error messages are given in the ebRS standard and detailed in ITI TF-3: 4.2.4 Error Reporting. This transaction does not support a partial success response.

XML namespace prefixes used in text and in examples below are for informational purposes only and are documented in ITI TF-2x: Appendix V, Table 2.4-1.

The requirements for the response message are:

- the Content-Type HTTP header shall have an action parameter with the value urn:ihe:iti:2007:ProvideAndRegisterDocumentSet-bResponse

- the <wsa:Action> SOAP header shall contain the value urn:ihe:iti:2007:ProvideAndRegisterDocumentSet-bResponse

- the <soap12:Body> soap element shall contain one <rs:RegistryResponse> element

See ITI TF-3: 4.2.4.1 for examples of response messages.

3.41.4.2.2.1 XDS Document Repository Message Semantics

If the XDS Document Repository supports the Asynchronous Web Services Exchange Option and it receives an Asynchronous Web Services request, it shall respond as defined in ITI TF-2x: Appendix V.5.

3.41.4.2.3 Expected Actions

The Content Sender should examine the status and messages returned and take appropriate action.

3.41.5 Security Considerations

Relevant XDS Affinity Domain security considerations are discussed in the XDS Security Considerations Section (see ITI TF-1: 10.7).

3.41.5.1 Audit Record Considerations

The Provide and Register Document Set-b transaction is either a PHI-Import event or a PHI-Export event, depending on actor, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1, with the following exceptions.

3.41.5.1.1 Document Source Audit Message

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	Field Name	**Opt**	**Value Constraints**
Event AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-41", "IHE Transactions", "Provide and Register Document Set-b")
Source (Document Source) (1)			
Human Requestor (0..n)			
Destination (Document Repository) (1)			
Audit Source (Document Source) (1)			
Patient (1)			
SubmissionSet (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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	SOAP 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.

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Audit Source AuditMessage AuditSourceIdentifi cation	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

Submission Set (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

3.41.5.1.2 Document Repository or Document Recipient audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-41", "IHE Transactions", "Provide and Register Document Set-b")
Source (Document Source) (1)			
Destination (Document Repository or Document Recipient) (1)			
Audit Source (Document Repository or Document Recipient) (1)			
Patient (1)			
SubmissionSet (1)			

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Where:

Source AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, 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	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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/ AuditSourceIdentificati on	AuditSourceID	U	not specialized
	AuditEnterpriseSiteID	U	not specialized
	AuditSourceTypeCode	U	not specialized

Patient (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format.
	ParticipantObjectName	U	not specialized
	ParticipantObjectQuery	U	not specialized
	ParticipantObjectDetail	U	not specialized

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Submission Set (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	U	not specialized
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	U	not specialized
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	U	not specialized
	ParticipantObjectQuery	U	not specialized
	ParticipantObjectDetail	U	not specialized

3.42 Register Document Set-b [ITI-42]

This section corresponds to Transaction [ITI-42] of the IHE IT Infrastructure Technical Framework. Register Document Set-b is used to register a set of document-associated metadata.

3.42.1 Scope

The Register Document Set-b transaction passes a Document Submission Request (see ITI TF-3: 4.2.1.5) from a Content Sender to a Content Receiver.

3.42.2 Actor Roles

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

Table 3.42.2-1: Actor Roles

Role:	**Content Sender**: A system that submits a document metadata to a Content Receiver.
Actor(s):	The following actors may play the role of Content Sender: Document Repository, Integrated Document Source/Repository
Role:	**Content Receiver**: A system that receives document metadata.
Actor(s):	The following actors may play the role of Content Receiver: Document Registry

Transaction text specifies behavior for each Role. The behavior of specific Actors may also be specified when it goes beyond that of the general Role.

3.42.3 Referenced Standards

ebRIM	OASIS/ebXML Registry Information Model v3.0
	This model defines the types of metadata and content that can be stored in an ebXML Registry, a basis for and subset of Document Sharing metadata.
ebRS	OASIS/ebXML Registry Services Specifications v3.0
	This defines the services and protocols for an ebXML Registry, used as the basis for the XDS Document Registry
HL7V2	HL7 Version 2.5
See ITI TF-2x: Appendix V for other referenced standards for SOAP encoding. See ITI TF-3: 4.2 for other referenced standards for metadata element encoding.	

3.42.4 Interaction Diagram

Content
Sender

Content
Receiver

Register Document Set – b Request

Register Document Set – b Response
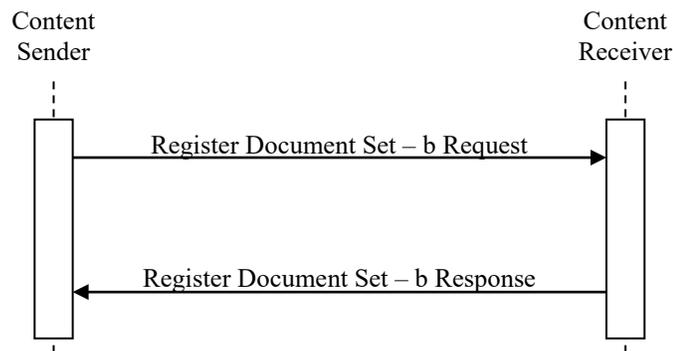
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3.42.4.1 Register Document Set-b Request

The Register Document Set-b Request message is used to register patient-specific healthcare documents through the use of metadata. Metadata enables the receiver to process the content of 4270 the message programmatically, without needing to understand the format or contents of the documents. For more details about metadata in the context of Document Sharing, see ITI TF-3:4.

The Content Sender sends metadata for a set of documents to the Content Receiver.

3.42.4.1.1 Trigger Events

The Register Document Set-b Request message is triggered when a Content Sender wants to 4275 register metadata for a set of documents it holds. These documents may have been stored in the Document Repository by a Document Source (using the Provide and Register Document Set-b transaction [ITI-41]) or generated internally by an Integrated Document Source/Repository.

3.42.4.1.2 Message Semantics

The Register Document Set-b Request message shall use SOAP 1.2 and Simple SOAP (See ITI 4280 TF-2x: V.8.1). Implementors of this transaction shall comply with all requirements described in: ITI TF-2x: Appendix V: Web Services for IHE Transactions.

The Register Document Set-b Request message shall contain a Submission Request, as defined in ITI TF-3: 4.1.4.

All DocumentEntry objects in this Submission Request shall be Stable DocumentEntry objects 4285 and, therefore, will not be On-Demand DocumentEntry objects. Associations included in the Submission Request may reference On-Demand DocumentEntry objects that have been registered previously.

See ITI TF-3: 4.2.1.4 for a description of the ebRS/ebRIM representation of a Submission Request. The metadata requirements for this Submission Request are defined in ITI TF-3: 4.3.1.

4290 A full example of document metadata submission can be found in ITI TF-2x: Appendix W.

XML namespace prefixes used in text and in examples below are for informative purposes only and are documented in ITI TF-2x: Appendix V, Table V.2.4-1.

The requirements for the request message are:

- the Content-Type HTTP header shall have an action parameter with the value
4295   urn:ihe:iti:2007:RegisterDocumentSet-b

- the <wsa:Action> SOAP element shall contain the value
urn:ihe:iti:2007:RegisterDocumentSet-b

- the <soap12:Body> shall contain one <lcm:SubmitObjectsRequest> element representing the Submission Request (see ITI TF-3: 4.2.1.4 for details of expressing a Submission
4300   Request).

A full XML Schema Document for the XDS types is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

Below is an example of the SOAP Body for a Register Document Set-b Request message

```
<soap12:Body>
    <lcm:SubmitObjectsRequest>
        <!-- Submission Request contents - See ITI TF-3: 4.2.1.4 -->
        <rim:RegistryObjectList>

         <!-- Registry Metadata goes here -->

        </rim:RegistryObjectList>
    </lcm:SubmitObjectsRequest>
</soap12:Body>
```

4315   If the Content Sender supports the Asynchronous Web Services Exchange Option, it shall be able to generate an Asynchronous Web Services request as defined in ITI TF-2x: Appendix V.5.

3.42.4.1.2.1 Integrated Document Source / Repository Message Semantics

The Integrated Document Source / Repository may choose to support options which are listed in ITI TF-1: Table 10.2-1b and described in the sections that follow it.

4320   If the Integrated Document Source / Repository supports the Document Replacement Option, it shall be able to generate replace semantics as defined in ITI TF-3: 4.2.2.2.3.

If the Integrated Document Source / Repository supports the Document Addendum Option, it shall be able to generate append semantics as defined in ITI TF-3: 4.2.2.2.1.

If the Integrated Document Source / Repository supports the Document Transformation Option,
4325   it shall be able to generate transformation semantics as defined in ITI TF-3: 4.2.2.2.2.

If the Integrated Document Source / Repository supports the Folder Management Option it, shall be able to generate folder semantics as defined in ITI TF-3: 4.2.1.3 and ITI TF-3: 4.2.2.1.5.

If the Integrated Document Source / Repository supports the Basic Patient Privacy Enforcement Option, it shall comply with the requirements as described in ITI TF-1: 10.2.9.

4330 **3.42.4.1.3 Expected Actions**

Upon receipt of a Register Document Set-b Request message, the Document Registry shall:

- Perform metadata validations

- Store all IHE-defined metadata attributes received so that it is available to return in responses to future queries.

4335 - Return a response message giving the status of the operation.

If the Document Registry rejects the metadata, it shall:

- Return an error including at least one error message in the response. For a complete list of applicable codes, refer to ITI TF-3: Table 4.2.4.1-2.

- Roll back any changes made.

4340 **3.42.4.1.3.1 Atomicity of Submissions**

XDS Submission requests shall be atomic operations. If any part of the Submission Request processing fails, the entire transaction shall fail and no changes result.

No result of a Submission Request shall be made available until the atomic operation has successfully completed.

4345 **3.42.4.1.3.2 Extra Metadata**

The Document Registry may save extra metadata attributes.

- If the Document Registry saves the extra metadata attributes, it shall include that metadata in later query responses.

4350 - If there are extra metadata attributes in the Submission Request and the Document Registry does not save them, the Document Registry shall include the XDSExtraMetadataNotSaved warning in its response, as described in ITI TF-3: 4.2.3.1.6

- Document Registry Actors that do not support the Reference ID Option may treat referenceIdList as a non-IHE-defined metadata attribute.

The Document Registry shall verify that extra metadata attributes conform to the requirements in
4355 ITI TF-3: 4.2.3.1.6.

3.42.4.1.3.3 Enforcement of Attributes

The Document Registry shall validate the Submission Request objects and attributes as specified in ITI TF-3: 4.2 and 4.3.1. In addition, the following constraints apply.

3.42.4.1.3.3.1 DocumentEntry.uniqueId

4360 The Document Registry shall reject the message and return an error if the uniqueId attribute matches the uniqueId attribute of a DocumentEntry within the Document Registry and the size attributes or hash attributes of the two DocumentEntry objects differ.

If the uniqueId, size, and hash attributes of a received DocumentEntry match those of a DocumentEntry already within the Document Registry, processing of the submission shall continue without an error. Thus, multiple registered DocumentEntry objects can have the same uniqueId attribute value (as long as all the size and hash attributes are the same).

Note: The Document Entries may reference the same instance of the document or may reference different (identical) copies of the document (for example, stored on different Document Repositories).

3.42.4.1.3.3.2 patientId Attributes

Values of DocumentEntry.patientId, Folder.patientId, and SubmissionSet.patientId shall be verified against the patient identifiers received in the Patient Identity Feed [ITI-8] indicating that they are registered with the Patient ID Domain of the Affinity Domain. This validation requirement does not apply to DocumentEntry.sourcePatentId.

All objects in the Submission Request (DocumentEntry, Folder and SubmissionSet) shall have the same patientId.

The value of the patientId attribute of a DocumentEntry object shall match the value of the patientId attribute of any Folder that it is a member of. This implies that all DocumentEntry objects in a Folder have the same patientId.

When the Submission Request includes a Document Relationship Association, both DocumentEntry objects referenced by the Association shall have the same patientId.

3.42.4.1.3.3.3 Coded Attributes

The XDS Affinity Domain may allow only a finite set of values for a given coded attribute conforming to ITI TF-3: 4.2.3.1.2 or may not restrict the values at all. If the XDS Affinity Domain allows only a finite set, the Document Registry shall constrain the value to those allowed by the XDS Affinity Domain.

The Document Registry shall not constrain the displayName.

Note: In this section, "value" refers to the combination of a codeSystem and code.

3.42.4.1.3.3.4 DocumentEntry.mimeType

The value of the DocumentEntry.mimeType shall be constrained to those allowed by the XDS Affinity Domain.

3.42.4.1.3.3.5 DocumentEntry.availabilityStatus

The Document Registry shall set the availabilityStatus of all newly added DocumentEntry objects to Approved.

3.42.4.1.3.3.6 DocumentEntry.serviceStartTime and DocumentEntry.serviceStopTime

If the serviceStartTime and serviceStopTime attributes are both populated for a Document Entry in the Submission Request, the Document Registry shall verify that the serviceStartTime is before or equal to the serviceStopTime.

3.42.4.1.3.3.7 SubmissionSet.uniqueId

The Document Registry shall verify that the SubmissionSet.uniqueId is not used as the uniqueId for any existing object in the registry (DocumentEntry, SubmissionSet, or Folder).

3.42.4.1.3.4 Folder Membership

When the Submission Request includes an FD-DE HasMember Association, which identifies a Document Entry as a member of a Folder, the Document Registry shall verify that both the Document Entry and Folder have a status of Approved.

3.42.4.1.3.5 Document Relationships

When the Submission Request includes an Association between two Document Entry objects, the Document Registry shall verify that:

- The sourceObject references a Document Entry in the submission; otherwise it shall return the error `UnresolvedReferenceException`.

- The targetObject references a Document Entry in the Registry; otherwise it shall return the error `UnresolvedReferenceException`.

- The targetObject Document Entry has an availabilityStatus of Approved; otherwise, it shall return the error `XDSRegistryDeprecatedDocumentError`. This ensures that only the most recent version of a document can be replaced, etc.

- Both Document Entry objects have the same patient identifier (XDSDocumentEntry.patientId attribute); otherwise it shall return the error `XDSPatientIdDoesNotMatch`. This comparison shall take into consideration patient identity merges as described in ITI TF-2a: 3.8.4.2.4.

Note: For "RPLC" and "XFRM_RPLC" relationships, earlier versions of the Technical Framework referenced the error `XDSReplaceFailed` for most of the above conditions. That error has been deprecated.

When the Association type is "RPLC" or "XFRM_RPLC", the Document Registry shall also:

- Change the status of the Document Entry that is being replaced to Deprecated.

- Change the status of all Document Entries that are transformations (XFRM) or addenda (APND) of the Document Entry being replaced to Deprecated.

When the Association type is "IsSnapshotOf", the Document Registry shall also:

- Verify sourceObject references a Stable DocumentEntry

- Verify targetObject references an On-Demand DocumentEntry

As per Section 3.42.4.1.4.1, no changes to the status of any object shall occur if the Submission
4430   Request is not accepted and committed.

3.42.4.1.3.6 Updates to Folder.lastUpdateTime

If the submission results in any Document Entry being placed into any Folder, the Document
Registry shall set the lastUpdateTime attribute of those Folders to the current time. This includes
Folders included in the Submission Request as well as Folders already existing in the Document
4435   Registry that are referenced by the Submission Request.

As per Section 3.42.4.1.4.1, no changes to the lastUpdateTime of any Folder shall occur if the
Submission Request is not accepted and committed.

3.42.4.1.3.7 UUIDs and Symbolic Ids

Objects in the Submission Request have several UUID fields conforming to ITI TF-3: 4.2.3.1.5.

4440   If a field is formatted as a symbolic Id in the Submission Request, the Document Registry shall
replace it with newly generated, properly formatted UUIDs upon acceptance of the submission.
If the same symbolic Id appears more than once in the Submission Request, it shall be replaced
with the same generated UUID.

If a field is formatted as a valid UUID in the Submission Request, the Document Registry shall
4445   not change the value.

Once a UUID-format Id value is assigned to a Registry Object, that value is permanent and shall
not be changed.

3.42.4.2 Register Document Set-b Response

3.42.4.2.1 Trigger Events

4450   The Content Receiver finishes processing a Register Document Set-b Request Message and shall
respond with Register Document Set-b Response

3.42.4.2.2 Message Semantics

The Register Document Set-b Response message shall use SOAP 1.2 and Simple SOAP (See ITI
TF-2x: V.8.1). Implementors of this transaction shall comply with all requirements described in:
4455   ITI TF-2x: Appendix V: Web Services for IHE Transactions.

The Register Document Set-b Response message shall carry the status of the requested operation.
The response message may carry warning messages. If the requested operation fails, the response
message shall carry at least one error message. The conditions of failure and possible warning
and error messages are given in the ebRS standard and detailed in ITI TF-3: 4.2.4 Error
4460   Reporting. This transaction does not support a partial success response.

XML namespace prefixes used in text and in examples below are for informational purposes
only and are documented in ITI TF-2x: Appendix V, Table V.2.4-1.

The requirements for the response message are:

- the Content-Type http header shall have an action parameter with the value
  urn:ihe:iti:2007:RegisterDocumentSet-bResponse

- the <wsa:Action> soap header shall contain the value
  urn:ihe:iti:2007:RegisterDocumentSet-bResponse

- the <soap12:Body> soap element shall contain one <rs:RegistryResponse> element

See ITI TF-3: 4.2.4 for examples of response messages.

If the Document Registry supports the Asynchronous Web Services Exchange Option and it receives an Asynchronous Web Services request, it shall respond as defined in ITI TF-2x: Appendix V.5.

3.42.4.2.3 Expected Actions

The Content Sender now knows that the transaction succeeded/failed and can continue. The metadata added to the Document Registry as a result of this transaction is now available for discovery.

3.42.4.2.3.1 Document Repository Expected Actions

If the Register Document Set-b [ITI-42] response includes any errors or warnings, the Document Repository shall include all such errors and warnings in the Provide and Register Document Set-b [ITI-41] response.

3.42.5 Security Considerations

Relevant XDS Affinity Domain Security background is discussed in the XDS Security Considerations Section (see ITI TF-1: 10.7).

3.42.5.1 Audit Record Considerations

The Register Document Set-b transaction is either a PHI-Import event or a PHI-Export event, depending on actor, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1, with the following exceptions.

3.42.5.1.1 Document Repository or Integrated Document Source/Repository audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-42", "IHE Transactions", "Register Document Set-b")
Source (Document Repository or Integrated Document Source/Repository) (1)			
Human Requestor (0..n)			
Destination (Document Registry) (1)			
Audit Source (Document Repository or Integrated Document Source/Repository) (1)			

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Patient (0..1)
SubmissionSet (1)

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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.

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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	SOAP 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*

Patient (if known) (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

Submission Set (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

3.42.5.1.2 Document Registry audit message:

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	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-42", "IHE Transactions", "Register Document Set-b")

Source (Document Repository or Integrated Document Source/Repository) (1)
Destination (Document Registry) (1)
Audit Source (Document Registry) (1)
Patient (0..1)
SubmissionSet (1)

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, 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	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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*

Patient (if known) (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 in HL7 CX format.
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	U	*not specialized*

4500

Submission Set (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	U	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	U	*not specialized*
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	U	*not specialized*

3.43 Retrieve Document Set [ITI-43]

This section corresponds to transaction ITI-43 of the IHE Technical Framework. The Document Consumer, Document Repository, On-Demand Document Source, and Initiating Gateway Actors use transaction ITI-43.

Integration Profiles using this Transaction
Cross-Enterprise Document Sharing-b (XDS.b)
Cross-Community Access (XCA)

Actors that support the Asynchronous Web Services Exchange Option shall support Asynchronous Web Services Exchange on all XDS.b transactions they implement. Refer to Section ITI TF-2x: V.5 Synchronous and Asynchronous Web Services Exchange for an explanation of Asynchronous Web Services Exchange.

3.43.1 Scope

This transaction is used by the Document Consumer to retrieve a set of documents from the Document Repository, On-Demand Document Source, or Initiating Gateway. The Document Consumer has already obtained the XDSDocumentEntry uniqueId and the Document Repository repositoryUniqueId from the Document Registry/Initiating Gateway by means of the Registry Stored Query transaction.

3.43.2 Use Case Roles
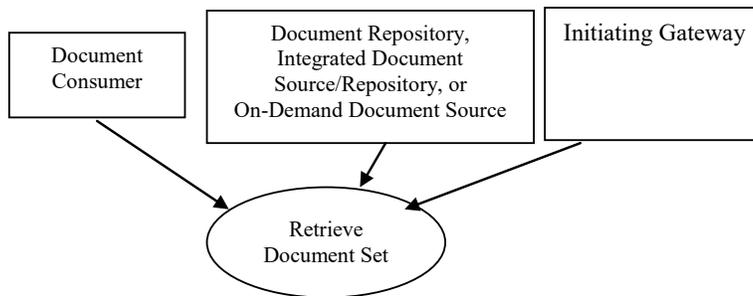
Actor: Document Consumer

Role: Obtains document.

Actor: Document Repository or Integrated Document Source/Repository

Role: Provides documents.

Actor: Initiating Gateway

4530

Role: An Initiating Gateway which implements the XDS Affinity Domain Option retrieves a set of documents by using the Cross Gateway Retrieve transaction and/or a Retrieve Document Set transaction.

Actor: On-Demand Document Source

Role: Creates documents in response to a request for retrieval of an on-demand document entry.

4535

Note: Within this transaction, the Document Repository and Integrated Document Source/Repository Actors can be used interchangeably.

3.43.3 Referenced Standard

Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

ebRIM	OASIS/ebXML Registry Information Model v3.0
ebRS	OASIS/ebXML Registry Services Specifications v3.0
ITI TF-3:4	Metadata in Document Sharing profiles
MTOM	SOAP Message Transmission Optimization Mechanism http://www.w3.org/TR/soap12-mtom/
XOP	XML-binary Optimized Packaging http://www.w3.org/TR/2005/REC-xop10-20050125/

4540

3.43.4 Interaction Diagram

Document Consumer

Document Repository/ Initiating Gateway/On-Demand Document Source

Retrieve Document Set Request

Retrieve Document Set Response
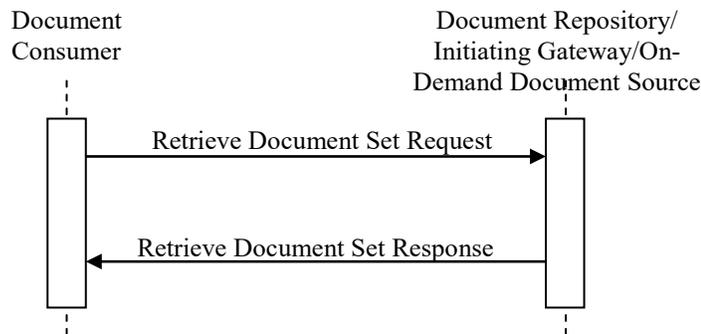
4545

3.43.4.1 Retrieve Document Set Request

3.43.4.1.1 Trigger Events

The Document Consumer obtains document(s) uniqueId via the Registry Stored Query transaction. If the Registry Stored Query was sent to the Initiating Gateway the Document Consumer shall address the Retrieve Document Set to the Initiating Gateway. In this case no resolution of repositoryUniqueId is needed by the Document Consumer. The Document Consumer shall specify the homeCommunityId element in the Retrieve Document Set transaction if it was found in the entry containing the uniqueId of the document being retrieved. For more information regarding the homeCommunityId see Section 3.38.4.1.2.

Once the document(s) uniqueId have been obtained, the Document Consumer will start the Retrieve Document Set Request with the Document Repository.

3.43.4.1.2 Message Semantics

The Retrieve Document Set Request shall carry the following information:

- A required repositoryUniqueId that identifies the repository from which the document is to be retrieved. This value corresponds to XDSDocumentEntry.repositoryUniqueId.

- A required documentUniqueId that identifies the document within the repository. This value corresponds to the XDSDocumentEntry.uniqueId.

- If available, the homeCommunityId element that identifies the community holding the document. The homeCommunityId element shall be specified if the XDSDocumentEntry containing the uniqueId of the document contains the homeCommunityId attribute. See ITI TF-2a: 3.18.4.1.2 for details.

The repositoryUniqueId associated to each document requested can be different therefore allowing a single request to identify multiple repositories.

3.43.4.1.3 Expected Actions

When receiving a Retrieve Document Set Request, a Document Repository or an Initiating Gateway shall generate a Retrieve Document Set Response containing the requested documents or error codes if the documents could not be retrieved.

An XCA Initiating Gateway receiving the Retrieve Document Set Request shall use the homeCommunityId to obtain the Web Services endpoint of the Responding Gateways or, in the case where homeCommunityId identifies the local community, use the repositoryUniqueId to obtain the Web Services endpoint of the Document Repositories. The process of obtaining the Web Services endpoint is not further specified in this transaction. The Initiating Gateway shall send Cross Gateway Retrieves/Retrieve Document Set transactions to each appropriate Responding Gateway/Document Repository, consolidate the results, and return them to the Document Consumer.

3.43.4.1.3.1 Basic Patient Privacy Enforcement Option

If the Basic Patient Privacy Enforcement Option is implemented:

1. The Document Consumer shall abide by the XDS Affinity Domain Policies represented by the confidentialityCode in the metadata associated with the document. The Document Consumer likely will have user access controls or business rule capabilities to determine the details of how confidentiality codes apply to query results. The details of this are product specific and not specified by IHE. These rules shall reduce the query results to only those that are appropriate to the current situation for that actor and user.

2. The Document Consumer shall be able to be configured with Patient Privacy Policies, Patient Privacy Policy Identifiers (OIDs) and associated information necessary to understand and enforce the XDS Affinity Domain Policy. The details of this are product specific and not specified by IHE.

3.43.4.2 Retrieve Document Set Response

3.43.4.2.1 Trigger Events

This message will be triggered by a Retrieve Document Set Request Message

3.43.4.2.2 Message Semantics

The Retrieve Document Set Response Message shall carry the following information, for each of the returned documents:

- A homeCommunityId. This value shall be the same as the homeCommunityId value in the Retrieve Document Set Request Message. If the homeCommunityId value is not present in the Retrieve Document Set Request Message, this shall not be present.

- A required repositoryUniqueId that identifies the repository from which the document is to be retrieved. This value shall be the same as the value of the repositoryUniqueId in the original Retrieve Document Set Request Message. This value corresponds to XDSDocumentEntry.repositoryUniqueId.

- A required documentUniqueId that identifies the document within the repository. This value shall be the same as the documentUniqueId in the original Retrieve Document Set Request Message. This value corresponds to the XDSDocumentEntry.uniqueId.

- The retrieved document as a XOP Infoset

- The MIME type of the retrieved document

- Errors or warnings in case the document(s) could not be retrieved successfully

If the documentUniqueId is associated with an On-Demand Document Entry, the Retrieve Document Set Response Message shall contain a NewDocumentUniqueId element that identifies the document that is returned in the Retrieve Document Set Response. This identifier shall be different than the DocumentUniqueId element which identifies the On-Demand Document Entry. The Retrieve Document Set Response Message may also include a NewRepositoryUniqueId

element that identifies the Document Repository which holds the document returned in the Retrieve Document Set Response. If this element is not included, the document returned in the response has not been persisted for later retrieval. If the On-Demand Document Source implements the Persistence of Retrieved Documents Option, this element shall be specified. If a future Retrieve Document Set Message for the same DocumentUniqueId returns the same NewDocumentUniqueId, the content of the document shall be identical to the prior returned content. On-Demand Document Source Actors are encouraged to re-use Document uniqueId's whenever content has not changed in order to facilitate identification of new content by Document Consumers.

3.43.4.2.3 Expected Actions

A Document Repository or On-Demand Document Source shall return the document(s) indicated in the request.

The Document Repository shall return the document or an error code in case the document could not be return. The conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: 4.2.4 Error Reporting.

An On-Demand Document Source which supports the Persistence of Retrieved Documents Option shall save the document content returned in the retrieve response and issue a Register Document Set-b [ITI-42] transaction to register a Stable Document Entry which describes the saved document. The On-Demand Document Source shall complete the registration of the Stable Document Entry prior to responding to the Retrieve Document Set request. The registration of the new Stable Document Entry shall include:

- A Submission Set

- A DocumentEntry representing the Stable DocumentEntry.

- A HasMember association linking DocumentEntry to SubmissionSet.

- An IsSnapshotOf Association which identifies the sourceObject as the new Stable Document Entry and the targetObject as the On-Demand Document Entry which contains the uniqueID used in the Retrieve Document Set request. See ITI TF-3: 4.2.2.2 for information about the IsSnapshotOf Association.

If the On-Demand Document Source has previously registered a snapshot of the On-Demand DocumentEntry, the registration of the new Stable DocumentEntry may also include a RPLC association, identifying the new Stable DocumentEntry as a replacement of the previously-registered Stable DocumentEntry.

If this is not the first request for this on-demand document and a prior document was replaced, a Replace Association which identifies the prior document.

3.43.4.2.3.1 Compatibility of Options

If the Document Consumer does not support the On-Demand Documents Option it will never send a Retrieve Document Set request for an On-Demand Document entry. In this case, none of the new attributes will be included in the response.

4655 If the Document Consumer does support the On-Demand Documents Option, it will only direct requests for On-Demand Document Entries to responders which have specified their unique repositoryUniqueId in the On-Demand Document Entry from the registry. Thus, unless there is an error in the metadata, there are no compatibility concerns with this transaction.

3.43.5 Protocol Requirements

4660 Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

The Retrieve Document Set transaction shall use SOAP12 and MTOM with XOP encoding (labeled MTOM/XOP in this specification). See ITI TF-2x: Appendix V.8 for details.

The Document Repository shall:

4665 • Accept the Retrieve Document Set Request message in MTOM/XOP format.

• Generate the Retrieve Document Set Response message in MTOM/XOP format

The Document Consumer shall:

• Generate the Retrieve Document Set Request message in MTOM/XOP format.

• Accept the Retrieve Document Set Response message in MTOM/XOP format.

4670 **WSDL Namespace Definitions**

ihe	urn:ihe:iti:xds-b:2007
rs	urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0
lcm	urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
query	urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0

Document Repository: These are the requirements for the Retrieve Document Set transaction presented in the order in which they would appear in the Document Repository WSDL definition:

4675 • The following types shall be imported (xsd:import) in the /definitions/types section:

• namespace="urn:ihe:iti:xds-b:2007", schema="IHEXDS.xsd"

• The /definitions/message/part/@element attribute of the Retrieve Document Set Request message shall be defined as "ihe:RetrieveDocumentSetRequest"

• The /definitions/message/part/@element attribute of the Retrieve Document Set Response message shall be defined as "ihe:RetrieveDocumentSetResponse"

4680 • Refer to Table 3.43.5.b below for additional attribute requirements

To support the Asynchronous Web Services Exchange Option on the Document Consumer, the Document Repository shall support the use of a non-anonymous response EPR in the WS-Addressing replyTo header.

4685

Table 3.43.5.b: Additional Attribute Requirements

Attribute	Value
/definitions/portType/operation@name	DocumentConsumer_RetrieveDocumentSet
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2007:RetrieveDocumentSet
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2007:RetrieveDocumentSetResponse
/definitions/binding/operation/wsoap12:operation/@soapActionRequired	false

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.43.5.1 Sample SOAP Messages.

4690 For informative WSDL for the Document Repository see in ITI TF-2x: Appendix W.

The <ihe:RetrieveDocumentSetRequest/> element is defined as:

- One or more <ihe:DocumentRequest/> elements, each one representing an individual document that the Document Consumer wants to retrieve from the Document Repository. Each <ihe:DocumentRequest/> element contains:

4695
  - A required <ihe:RepositoryUniqueId/> element that identifies the repository from which the document is to be retrieved. This value corresponds to XDSDocumentEntry.repositoryUniqueId.

  - A required <ihe:DocumentUniqueId/> that identifies the document within the repository. This value corresponds to the XDSDocumentEntry.uniqueId.

4700
  - An optional <ihe:HomeCommunityId/> element that corresponds to the home attribute of the Identifiable class in ebRIM.

This allows the Document Consumer to specify one or more documents to retrieve from the Document Repository.

The <ihe:RetrieveDocumentResponse/> element is defined as:

4705
- A required /ihe:RetrieveDocumentSetResponse/rs:RegistryResponse element

- An optional sequence of <ihe:DocumentResponse/> elements containing

  - A <ihe:HomeCommunityId/> element. The value of this element shall be the same as the value of the /RetrieveDocumentSetRequest/DocumentRequest/HomeCommunityId element in the
4710
  Retrieve Document Set Request Message. If the <ihe:HomeCommunityId/> element is not present in the Retrieve Document Set Request Message, this value shall not be present.

4715

- A required <ihe:RepositoryUniqueId/> that identifies the repository from which the document is to be retrieved. The value of this element shall be the same as the value of the /RetrieveDocumentSetRequest/DocumentRequest/RepositoryUniqueId element in the original Retrieve Document Set Request Message. This value corresponds to XDSDocumentEntry.repositoryUniqueId.

4720

- A required <ihe:DocumentUniqueId/> that identifies the document within the repository. The value of this element shall be the same as the value of the /RetrieveDocumentSetRequest/DocumentRequest/DocumentUniqueId element in the original Retrieve Document Set Request Message. This value corresponds to XDSDocumentEntry.uniqueId.

4725

- A required <ihe:Document/> element that contains the retrieved document using the xsi:base64Binary data type. (Note: This is the logical representation of the document in the XML. The wire format may be different; see ITI TF-2x: Appendix V.8.)

- A required <ihe:mimeType/> element that indicates the MIME type of the retrieved document

4730

- An optional <ihe:NewDocumentUniqueId/> element that identifies the document returned in the request when retrieval is of an On-Demand Document. This is required when retrieval is of an On-Demand Document.

- An optional <ihe:NewRepositoryUniqueId/> element that identifies the Document Repository that will support retrieval of the document created as a result of retrieval of the On-Demand Document. This is required when the On-Demand Document Source supports the Persistence of Retrieved Documents Option.

4735 The /RetrieveDocumentSetResponse/rs:RegistryResponse/@status attributes provides the overall status of the request: It shall contain one of the following values:

```
urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success

urn:ihe:iti:2007:ResponseStatusType:PartialSuccess

urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Failure
```

4740 See ITI TF-3: 4.2.4 Error Reporting for the interpretation of these values.

For each document requested in a /RetrieveDocumentSetRequest/DocumentRequest element:

- If a warning is reported when retrieving the document, then a /RetrieveDocumentSetResponse/rs:RegistryResponse/rs:RegistryErrorList/ rs:RegistryError element shall be returned with:

4745

- @severity is urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Warning

- @errorCode is specified

- @codeContext contains the warning message

- @location contains the DocumentUniqueId of the document requested

4750
- The document shall be returned in an instance of /RetrieveDocumentSetResponse/DocumentResponse/Document as a XOP Infoset. The returned document and warning are correlated via the DocumentUniqueId.

- If an error is reported when retrieving a document, then a /RetrieveDocumentSetResponse/rs:RegistryResponse/rs:RegistryErrorList/ rs:RegistryError element shall be returned with:

4755
  - @severity is urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error

  - @errorCode is specified

  - @codeContext contains the error message

  - @location contains the DocumentUniqueId of the document requested

- No corresponding RetrieveDocumentSetResponse/DocumentResponse element shall be
4760   returned

- If the document is successfully retrieved (without warning) then no /RetrieveDocumentSetResponse/rs:RegistryResponse/rs:RegistryErrorList/ rs:RegistryError element shall be present and a /RetrieveDocumentSetResponse/DocumentResponse/Document element shall be returned
4765   containing the document as a XOP Infoset.

The /RetrieveDocumentSetResponse/rs:RegistryResponse/rs:ResponseSlotList element is not used in this transaction.

The /RetrieveDocumentSetResponse/rs:RegistryResponse/@requestId attribute is not used in this transaction.

4770   A full XML Schema Document for the XDS.b types is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.43.5.1 Sample SOAP Messages

The samples in the following two sections show a typical request and its relative response. The sample messages also show the WS-Addressing headers <Action/>, <MessageID/>,
4775   <ReplyTo/>…; these WS-Addressing headers are populated according to ITI TF-2x: Appendix V: Web Services for IHE Transactions.

3.43.5.1.1 Sample Retrieve Document Set SOAP Request

3.43.5.1.1.1 Synchronous Web Services Exchange

4780
```
POST /tf6/services/xdsrepositoryb HTTP/1.1
Content-Type: multipart/related;
    boundary=MIMEBoundaryurn_uuid_3448B7F8EA6E8B9DFC1289514997517;
    type="application/xop+xml";
    start="<0.urn:uuid:3448B7F8EA6E8B9DFC1289514997518@apache.org>";
```

```
4785        start-info="application/soap+xml"
       User-Agent: Axis2
       Host: ihexds.nist.gov:5000


       --MIMEBoundaryurn_uuid_3448B7F8EA6E8B9DFC1289514997517
4790   Content-Type: application/xop+xml; charset=UTF-8;
          type="application/soap+xml"
       Content-Transfer-Encoding: binary
       Content-ID: <0.urn:uuid:3448B7F8EA6E8B9DFC1289514997518@apache.org>

4795   <?xml version='1.0' encoding='UTF-8'?>
       <soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope">
           <soapenv:Header xmlns:wsa="http://www.w3.org/2005/08/addressing">
              <wsa:To soapenv:mustUnderstand="1"
                 >http://localhost:5000/tf6/services/xdsrepositoryb</wsa:To>
4800          <wsa:MessageID soapenv:mustUnderstand="1"
                 >urn:uuid:3448B7F8EA6E8B9DFC1289514997508</wsa:MessageID>
              <wsa:Action soapenv:mustUnderstand="1"
                 >urn:ihe:iti:2007:RetrieveDocumentSet</wsa:Action>
           </soapenv:Header>
4805      <soapenv:Body>
              <RetrieveDocumentSetRequest xmlns="urn:ihe:iti:xds-b:2007">
                  <DocumentRequest>
                      <RepositoryUniqueId>1.19.6.24.109.42.1.5</RepositoryUniqueId>
                      <DocumentUniqueId>1.42.20101110141555.15</DocumentUniqueId>
4810              </DocumentRequest>
              </RetrieveDocumentSetRequest>
           </soapenv:Body>
       </soapenv:Envelope>
       --MIMEBoundaryurn_uuid_3448B7F8EA6E8B9DFC1289514997517--

4815
```

This request message is in MTOM/XOP format because request/response message pairs must always be in the same format (MTOM/XOP vs. SIMPLE SOAP) and the response requires MTOM/XOP: one part for descriptive metadata and a second part for document contents.

3.43.5.1.1.2 Asynchronous Web Services Exchange

```
4820
       <s:Envelope
                  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
                  xmlns:a="http://www.w3.org/2005/08/addressing">
           <s:Header>
4825              <a:Action
       s:mustUnderstand="1">urn:ihe:iti:2007:RetrieveDocumentSet</a:Action>
                  <a:MessageID>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:MessageID>
                  <a:ReplyTo>
                      <a:Address>
4830   http://192.168.2.4:9080/XdsService/DocumentConsumerReceiver.svc</a:Address>
                  </a:ReplyTo>
                  <a:To
       s:mustUnderstand="1">http://localhost:2647/XdsService/DocumentRepositoryReceiver.svc</
       a:To>
4835      </s:Header>
          <s:Body>
                  <RetrieveDocumentSetRequest xmlns="urn:ihe:iti:xds-b:2007">
                      <DocumentRequest>
```

```
4840                         <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                            <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                        </DocumentRequest>
                        <DocumentRequest>
                            <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                            <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
4845                    </DocumentRequest>
                </RetrieveDocumentSetRequest>
            </s:Body>
        </s:Envelope>
```

4850 3.43.5.1.2 Sample Retrieve Document Set SOAP Response

3.43.5.1.2.1 Synchronous Web Services Exchange

In the following example, the HTTP header `Transfer-Encoding: chunked` and the corresponding chunk annotations were removed for readability.

```
4855  HTTP/1.1 200 OK
      Server: Apache-Coyote/1.1
      Content-Type: multipart/related;
          boundary=MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310;
          type="application/xop+xml";
4860      start="0.urn:uuid:E910375860336E2B8F1289514978311@apache.org";
          start-info="application/soap+xml";
      Date: Thu, 11 Nov 2010 22:36:15 GMT

      --MIMEBoundaryurn uuid E910375860336E2B8F1289514978310
4865  Content-Type: application/xop+xml; charset=UTF-8;
          type="application/soap+xml"
      Content-Transfer-Encoding: binary
      Content-ID: <0.urn:uuid:E910375860336E2B8F1289514978311@apache.org>

4870  <?xml version='1.0' encoding='UTF-8'?>
      <soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope"
          xmlns:wsa="http://www.w3.org/2005/08/addressing">
          <soapenv:Header>
              <wsa:Action soapenv:mustUnderstand="1"
4875               >urn:ihe:iti:2007:RetrieveDocumentSetResponse</wsa:Action>
              <wsa:RelatesTo>urn:uuid:3448B7F8EA6E8B9DFC1289514997508</wsa:RelatesTo>
          </soapenv:Header>
          <soapenv:Body>
              <xdsb:RetrieveDocumentSetResponse xmlns:xdsb="urn:ihe:iti:xds-b:2007">
4880              <rs:RegistryResponse xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
                      status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"/>
                  <xdsb:DocumentResponse>
                      <xdsb:RepositoryUniqueId
                        >1.19.6.24.109.42.1.5</xdsb:RepositoryUniqueId>
4885                  <xdsb:DocumentUniqueId
                        >1.42.20101110141555.15</xdsb:DocumentUniqueId>
                      <xdsb:mimeType>text/plain</xdsb:mimeType>
                      <xdsb:Document>
                          <xop:Include
4890                       href="cid:1.urn:uuid:E910375860336E2B8F1289514978312@apache.org"
                              xmlns:xop="http://www.w3.org/2004/08/xop/include"/>
                      </xdsb:Document>
                  </xdsb:DocumentResponse>
              </xdsb:RetrieveDocumentSetResponse>
4895      </soapenv:Body>
      </soapenv:Envelope>
```

```
4900    --MIMEBoundaryurn uuid E910375860336E2B8F1289514978310
        Content-Type: text/plain
        Content-Transfer-Encoding: binary
        Content-ID: <1.urn:uuid:E910375860336E2B8F1289514978312@apache.org>

        Four score and seven years ago our fathers brought forth on this continent a new nation,
        conceived in Liberty, and dedicated to the proposition that all men are created equal.
4905    --MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310--
```

This example shows the 'wire format' for MTOM/XOP. The Document element contains a
<xop:Include> element that points to the document contents as a separate attachment.

4910
Note: In some systems, the 'in memory' format replaces the <xop:Include> with the Base64 encoded contents of the
         document. This is done so the entire message contents fits into an XML parse tree.

A second form of the response is possible, an un-optimized MTOM/XOP message. In this form
the message is still formatted as a multipart but the document contents is not split out into a
separate part of the multipart. Some popular Web Service toolkits generate this form for very
small documents. The same response in this form looks like:

4915
```
        HTTP/1.1 200 OK
        Server: Apache-Coyote/1.1
        Content-Type: multipart/related;
            boundary=MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310;
4920        type="application/xop+xml";
            start="0.urn:uuid:E910375860336E2B8F1289514978311@apache.org";
            start-info="application/soap+xml";
        Date: Thu, 11 Nov 2010 22:36:15 GMT

4925    --MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310
        Content-Type: application/xop+xml; charset=UTF-8;
            type="application/soap+xml"
        Content-Transfer-Encoding: binary
        Content-ID: <0.urn:uuid:E910375860336E2B8F1289514978311@apache.org>
4930
        <?xml version='1.0' encoding='UTF-8'?>
        <soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope"
            xmlns:wsa="http://www.w3.org/2005/08/addressing">
            <soapenv:Header>
4935            <wsa:Action soapenv:mustUnderstand="1"
                    >urn:ihe:iti:2007:RetrieveDocumentSetResponse</wsa:Action>
                <wsa:RelatesTo>urn:uuid:3448B7F8EA6E8B9DFC1289514997508</wsa:RelatesTo>
            </soapenv:Header>
            <soapenv:Body>
4940            <xdsb:RetrieveDocumentSetResponse xmlns:xdsb="urn:ihe:iti:xds-b:2007">
                  <rs:RegistryResponse
                    xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
                    status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"/>
                <xdsb:DocumentResponse>
4945                <xdsb:RepositoryUniqueId
                      >1.19.6.24.109.42.1.5</xdsb:RepositoryUniqueId>
                    <xdsb:DocumentUniqueId
                      >1.42.20101110141555.15</xdsb:DocumentUniqueId>
                    <xdsb:mimeType>text/plain</xdsb:mimeType>
4950                <xdsb:Document>
                        Base64 encoded contents of document go here
                    </xdsb:Document>
                </xdsb:DocumentResponse>
              </xdsb:RetrieveDocumentSetResponse>
4955    </soapenv:Body>
```

```
</soapenv:Envelope>
--MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310--
```

3.43.5.1.2.2 Asynchronous Web Services Exchange

```
4960    <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
        xmlns:a="http://www.w3.org/2005/08/addressing">
                <s:Header>
                        <a:Action
        s:mustUnderstand="1">urn:ihe:iti:2007:RetrieveDocumentSetResponse</a:Action>
                        <a:MessageID>urn:uuid:D6C21225-8E7B-454E-9750-821622C099DB</a:MessageID>
4965                    <a:RelatesTo>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:RelatesTo>
                        <a:To
        s:mustUnderstand="1">http://localhost:2647/XdsService/DocumentConsumerReceiver.svc</a:To>
                </s:Header>
                <s:Body>
4970                    <RetrieveDocumentSetResponse
                                xmlns="urn:ihe:iti:xds-b:2007"
                                xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
                                xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
                                xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
4975                            xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
                        <rs:RegistryResponse status="urn:oasis:names:tc:ebxml-
        regrep:ResponseStatusType:Success"/>
                        <DocumentResponse>
                                <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
4980                            <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                                <mimeType>text/xml</mimeType>

        <Document>UjBsR09EbGhjZ0dTQUxNQUFFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
                        </DocumentResponse>
4985                    <DocumentResponse>
                                <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                                <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                                <mimeType>text/xml</mimeType>

4990    <Document>UjBsR09EbGhjZ0dTQUxNQUFFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
                        </DocumentResponse>
                </RetrieveDocumentSetResponse>
                </s:Body>
        </s:Envelope>
```

4995 3.43.5.1.3 Sample Retrieve Document Set Response from On-Demand Document Entry

The following example shows the response to retrieval of a dynamic document entry where the responder supports later retrieval of the document created.

```
5000    <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
        xmlns:a="http://www.w3.org/2005/08/addressing">
         <s:Header>
          <a:Action
        s:mustUnderstand="1">urn:ihe:iti:2007:RetrieveDocumentSetResponse</a:Action>
5005      <a:RelatesTo>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:RelatesTo>
         </s:Header>
         <s:Body>
          <RetrieveDocumentSetResponse
             xmlns="urn:ihe:iti:xds-b:2007"
5010         xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
             xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
```

```
            xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
            xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
          <rs:RegistryResponse status="urn:oasis:names:tc:ebxml-
5015   regrep:ResponseStatusType:Success"/>
          <DocumentResponse>
           <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
           <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
            <NewDocumentUniqueId>1.3.6.1.4...2897</NewDocumentUniqueId>
5020        <NewRepositoryUniqueId>1.3.6.1.4...1000</NewRepositoryUniqueId>
           <mimeType>text/xml</mimeType>
           <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhhEUzhi</Document>
          </DocumentResponse>
          <DocumentResponse>
5025       <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
           <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
           <mimeType>text/xml</mimeType>
           <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhhEUzhi</Document>
          </DocumentResponse>
5030     </RetrieveDocumentSetResponse>
        </s:Body>
       </s:Envelope>
```

3.43.6 Security Considerations

Relevant XDS Affinity Domain Security background is discussed in the XDS Security
5035   Considerations Section (see ITI TF-1: 10.7).

3.43.6.1 Audit Record Considerations

The Retrieve Document Set transaction is either a PHI-Import event or a PHI-Export event,
depending on the actor, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1, with the following
exceptions.

5040   The Document Repository Actor, On-Demand Document Source, and Initiating Gateway shall
generate an "Export" event. This may be an event for each Retrieve Document transaction, or
multiple transactions for the same patient may be heuristically combined. The heuristics for this
combination are not specified by IHE. It is intended to reduce the volume of audit records.
Combination is permitted when the active participants and patient are the same, and the time
5045   difference is considered insignificant.

The Document Consumer shall generate an "Import" event. This may be one event per
transaction, or multiple transactions may be reported as a single event using a heuristic for
combining transactions. Combination is permitted when the active participants and patient are
the same, and the time difference is considered insignificant.

5050   If some documents were retrieved successfully and others were not, the Actors involved shall
record a "success" audit event for those documents retrieved successfully and a "failure" audit
event for those documents not retrieved successfully.

3.43.6.1.1 Document Consumer audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-43", "IHE Transactions", "Retrieve Document Set")
Source (Document Repository) (1)			
Destination (Document Consumer) (1)			
Human Requestor (0..n)			
Audit Source (Document Consumer) (1)			
Patient (0..1)			
Document (1..n) *(see combining rules above)*			

Where:

	Field Name	Opt	Value Constraints
Source **AuditMessage/** **ActiveParticipant**	UserID	M	SOAP endpoint URI
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"false"
	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.

5055

	Field Name	Opt	Value Constraints
Destination **AuditMessage/** **ActiveParticipant**	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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.

	Field Name	Opt	Value Constraints
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*

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

5060

Patient (if-known) (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 in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

Document (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	*M*	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of <ihe:DocumentUniqueId/>
	ParticipantObjectName	C	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	The ParticipantObjectDetail element may occur more than once. In one element, the value of <ihe:RepositoryUniqueId/> in value attribute, "Repository Unique Id" in type attribute In another element, the value of "ihe:homeCommunityID" as the value of the attribute *type* and the value of the homeCommunityID as the value of the attribute *value*

3.43.6.1.2 Document Repository, On-Demand Document Source, and Initiating Gateway audit message:

	Field Name	**Opt**	**Value Constraints**
Event AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-43", "IHE Transactions", "Retrieve Document Set")
Source (Document Repository) (1)			
Destination (Document Consumer) (1)			
Audit Source (Document Repository) (1)			
Document (1..n) *(see combining rules above)*			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"false"
	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.

5065

Destination AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

| Document URI (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	*M*	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of <ihe:DocumentUniqueId/>
	ParticipantObjectName	C	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	The ParticipantObjectDetail element may occur more than once. In one element, the value of <ihe:RepositoryUniqueId/> in value attribute, "Repository Unique Id" in type attribute In another element, the value of "ihe:homeCommunityID" as the value of the attribute *type* and the value of the homeCommunityID as the value of the attribute *value*

3.44 Patient Identity Feed HL7 V3 [ITI-44]

5070

This section corresponds to transaction ITI-44 of the IHE IT Infrastructure Technical Framework. Transaction ITI-44 is used by the Patient Identity Source, Patient Identifier Cross-reference Manager and Document Registry Actors.

3.44.1 Scope

5075 The scope is identical to ITI TF-2a: 3.8.1.

3.44.2 Use Case Roles
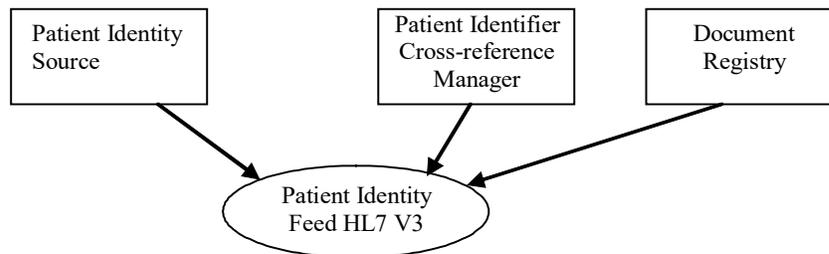
Actor: Patient Identity Source

5080 **Role:** Provides notification to the Patient Identifier Cross-reference Manager and Document Registry for any patient identification related events including: creation, updates, merges, etc.

Corresponding HL7 v3 Application Roles:

Patient Registry Informer (PRPA_AR201301UV02)

Actor: Patient Identifier Cross-reference Manager

5085 **Role:** Serves a well-defined set of Patient Identification Domains. Based on information provided in each Patient Identification Domain by a Patient Identification Source Actor, it manages the cross-referencing of patient identifiers across Patient Identification Domains.

Corresponding HL7 v3 Application Roles:

Patient Registry Tracker (PRPA_AR201302UV02)

5090 **Actor:** Document Registry

Role: Uses patient identifiers provided by Patient Identity Source to ensure that XDS Documents metadata registered is associated with a known patient and updates patient identity in document metadata by tracking identity change operations (e.g., merge).

Corresponding HL7 v3 Application Roles:

5095 Patient Registry Tracker (PRPA_AR201302UV02)

3.44.3 Referenced Standards

HL7 Version 3 Edition 2008 Patient Administration DSTU, Patient Topic (found at http://www.hl7.org/memonly/downloads/v3edition.cfm#V32008).

3.44.4 Interaction Diagrams
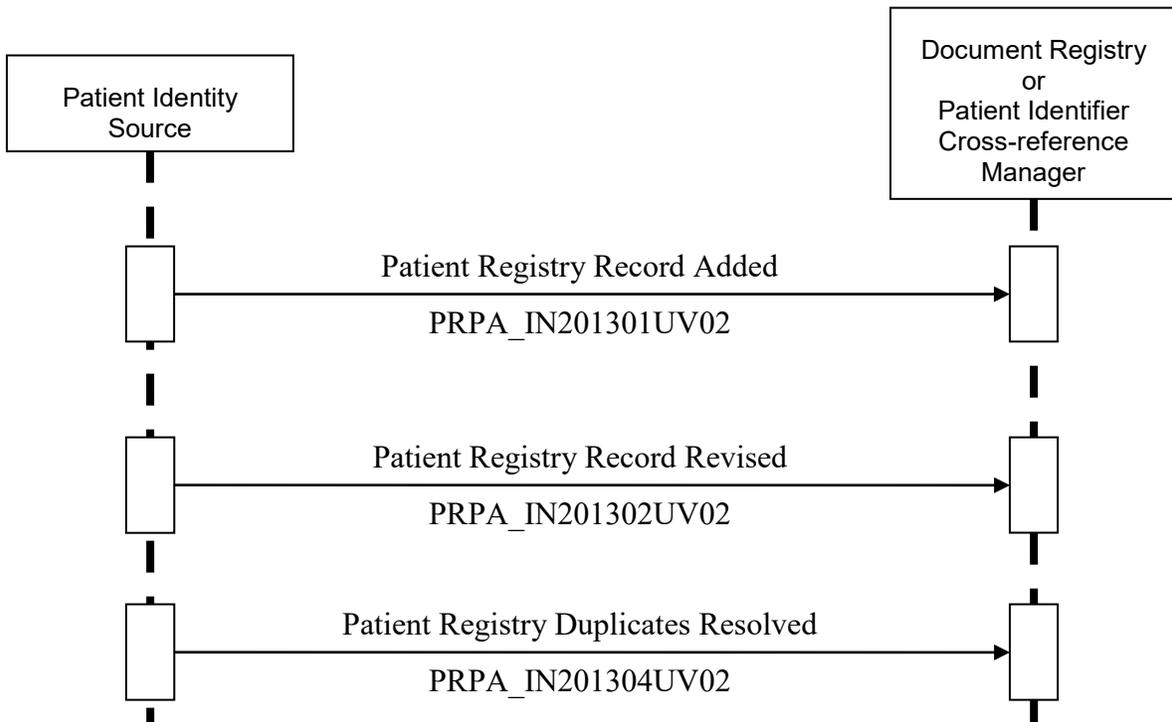
5100

Figure 3.44-1: Patient Identity Sequence

3.44.4.1 Patient Identity Management – Add or Revise Patient Record

3.44.4.1.1 Trigger Events

5105 The following events from a Patient Identity Source will trigger one of the Add or Revise Patient Record messages:

Patient Registry Record Added (PRPA_TE201301UV02)

This trigger event signals that a new patient was added to a Patient Identity Source.

Changes to patient demographics (e.g., change in patient name, patient address, etc.) shall trigger the following Patient Registry Record Revised message:

5110 **Patient Registry Record Revised (PRPA_TE201302UV02)**

This trigger event signals that patient information was revised in a Patient Identity Source.

The Patient Identifier Cross-reference Manager shall only perform cross-referencing logic on messages received from Patient Identity Source Actors. For a given Patient Identifier Domain there shall be one and only one Patient Identity Source Actor, but a given Patient Identity Source may serve more than one Patient Identifier Domain.

3.44.4.1.2 Message Semantics

The Patient Identity Feed transaction is carried out by the HL7 v3 Patient Activate (PRPA_MT201301UV02) and Patient Revise (PRPA_MT201302UV02) messages, as defined in the subsequent sections. The Patient Identity Source shall generate the message whenever a patient is registered or when some piece of patient demographic data changes. The components of the message listed below are required, and their detailed descriptions are provided in the following subsections.

Each message shall be acknowledged by the HL7 v3 Accept Acknowledgement (MCCI_MT000200UV01), which is described in ITI TF-2x: Appendix O.

The message information model in Section 3.44.4.1.2.2.describes the relevant data elements for this transaction. Specific requirements for the particular actors are found in Section 3.44.4.1.3 Expected Actions.

3.44.4.1.2.1 Major Components of the Patient Registry Record Added/Revised Messages

Patient

The *Patient* class is the entry point to the R-MIMs for the *Patient Activate (PRPA_RM201301UV02)* and *Patient Revise (PRPA_RM201302UV02)* models. The patient identifiers are captured using an Instance Identifier (II) data type. Please see ITI TF-2x: Appendix E for a detailed description about the use of the HL7 V3 II data type for patient identifiers.

Provider Organization

The Patient class is scoped by the provider organization where this person is a patient. The HL7 definition of the CMET requires that the provider organization needs to be identified by an id attribute, and at least one of address, telecommunications address, or contact person to be present. The id attribute SHALL have only a root, expressed as an ISO OID.

Person

The *Person* class contains identifying and demographic data elements for the focal person similar to those in the HL7 v2.x PID segment such as name, gender, date of birth, marital status and deceased indicator and time.

Language Communication

Information about what language(s) should be used to communicate with the focal person can be sent in the *LanguageCommunication* class.

PersonalRelationship

IHE IT Infrastructure Technical Framework, Volume 2b (ITI TF-2b): Transactions Part B

This is used for sending information pertaining to the mother's maiden name.

5150 **Citizen**

Citizenship information for a person, including citizen identifier and effective time can be sent in the *Citizen* class. The nation that scopes the *Citizen* role, as identified by *Nation.code*, is mandatory.

Other Identifiers

5155 The *OtherIDs* class is used to capture other identifiers associated with the person such as a driver's license number or social security number). In this transaction, the IDs assigned by the scoping provider organization are represented in the id attribute of the Patient class. All other IDs are represented in the OtherIDs class. For the purposes of interoperability, where both HL7 V3 and HL7 v2.x based transactions are used, the following requirement is imposed on the 5160 OtherIDs.id attribute and on the scopingOrganization.id attribute:

- OtherIDs.id.root SHALL be identical to scopingOrganization.id.root

- scopingOrganization.id.extension SHALL NOT have any value

Please see ITI TF-2x: E.2 for details on the use of the II data type for patient identifiers.

3.44.4.1.2.2 Message Information Model of the Patient Registry Record
5165 Added/Revised Messages

Below is the Message Information Model for both the Patient Activate and Patient Revise messages, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict common subset of the *Patient Activate (PRPA_RM201301UV02)* and *Patient Revise (PRPA_RM201302UV02)* RMIMs. While HL7 5170 defines two models for the two messages, a single common subset is sufficient for the purposes of this IHE transaction.

The base RMIMs can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201301UV.htm and Edition2008/domains/uvpa/editable/PRPA_RM201302UV.htm. The following restrictions are 5175 made on the original RMIMs to arrive at the restricted model:

- The focal entity choice is restricted to be only a person

The relationship holder of the personal relationship is restricted to be a person (using CMET COCT_MT030207UV)

The provider organization which is scoping the patient role is required in both the Add and 5180 Revise messages (it is optional in the original Revise message definition).

The following roles are omitted:

- asPatientOfOtherProvider

- guarantor

- guardian

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5185
- contactParty

- asMember

- careGiver

- asStudent

The following participations are omitted:

5190
- subjectOf (administrativeObservation)

- coveredPartyOf (coverage)
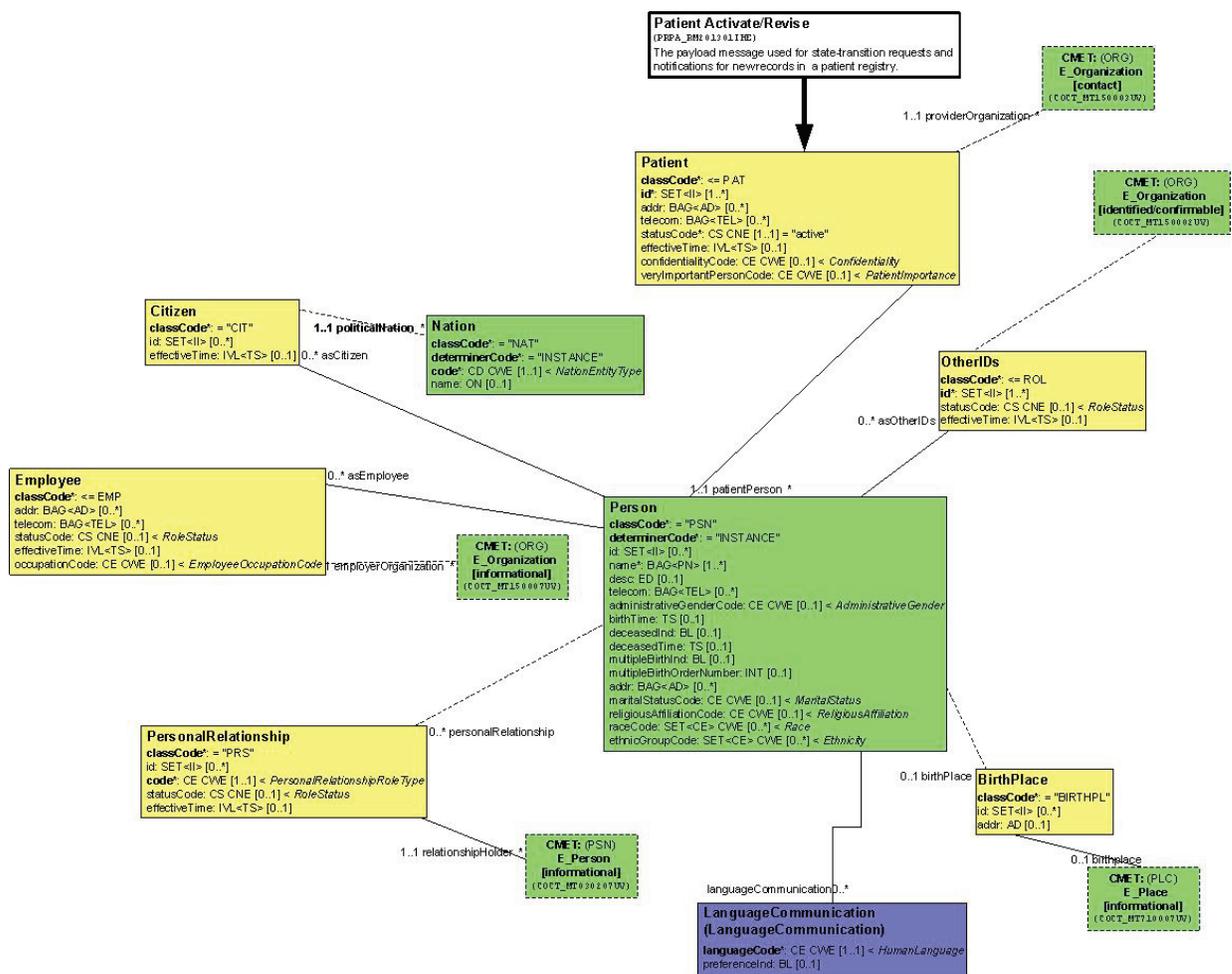
Figure 3.44.4.1.2-1: RMIM Diagram

5195

The attributes of this model are described in the following table. Note that CMETs are not discussed, as the HL7 definitions for them are being used.

Table 3.44.4.1.2-1: Model Attributes

PRPA_HD201301IHE Patient Activate/Revise	This HMD extract defines the message used to report that a new patient record was added, or a patient record was updated. Derived from Figure 3.44.4.1.2-1 (PRPA_RM201301IHE)
Patient	The primary record for the focal person in a Patient Identity Source
classCode [1..1] (M) Patient (CS) {CNE:PAT}	Structural attribute; this is a "patient" role
id [1..*] (M) Patient (SET<II>)	Identifiers designated by this patient identity source for the focal person
statusCode [1..1] Patient (CS) {CNE:active, fixed value= "active"}	A value specifying the state of this record in a patient registry (based on the RIM role class state-machine). This record is active.
confidentialityCode [0..*] Patient (SET<CE>) {CWE:Confidentiality}	Value(s) that control the disclosure of information about this living subject as a patient
veryImportantPersonCode [0..1] Patient (CE) {CWE:PatientImportance}	A code specifying the patient's special status granted by the scoper organization, often resulting in preferred treatment and special considerations. Examples include board member, diplomat.
Person	A subtype of LivingSubject representing a human being Either Person.name or Patient.id must be non-null
classCode [1..1] (M) Person (CS) {CNE:PSN, fixed value= "PSN"}	Structural attribute; this is a "person" entity
determinerCode [1..1] (M) Person (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific person
name [1..*] Person (BAG<PN>)	Name(s) for this person
telecom [0..*] Person (BAG<TEL>)	Telecommunication address(es) for communicating with this person
administrativeGenderCode [0..1] Person (CE) {CWE:AdministrativeGender}	A value representing the gender (sex) of this person. Note: this attribute does not include terms related to clinical gender which is a complex physiological, genetic and sociological concept that requires multiple observations in order to be comprehensively described.
birthTime [0..1] Person (TS)	The date and time this person was born
deceasedInd [0..1] Person (BL)	An indication that this person is dead
deceasedTime [0..1] Person (TS)	The date and time this person died
multipleBirthInd [0..1] Person (BL)	An indication that this person was part of a multiple birth
multipleBirthOrderNumber [0..1] Person (INT)	The order in which this person was born if part of a multiple birth
addr [0..*] Person (BAG<AD>)	Address(es) for corresponding with this person
maritalStatusCode [0..1]	A value representing the domestic partnership status of this person

PRPA_HD201301IHE Patient Activate/Revise	This HMD extract defines the message used to report that a new patient record was added, or a patient record was updated. Derived from Figure 3.44.4.1.2-1 (PRPA_RM201301IHE)
Person (CE) {CWE:MaritalStatus}	
religiousAffiliationCode [0..1] Person (CE) {CWE:ReligiousAffiliation}	A value representing the primary religious preference of this person
raceCode [0..*] Person (SET<CE>) {CWE:Race}	A set of values representing the races of this person
ethnicGroupCode [0..*] Person (SET<CE>) {CWE:Ethnicity}	A set of values representing the ethnic groups of this person
OtherIDs	Used to capture additional identifiers for the person such as a Drivers' license or Social Security Number. Please see notes above in the Major Components section on the use of OtherIDs.
classCode [1..1] (M) Role (CS) {CNE:ROL}	Structural attribute. This can be any specialization of "role" except for Citizen, or Employee.
id [1..*] (M) Role (SET<II>)	One or more identifiers issued to the focal person by the associated scopingOrganization (e.g., a Driver's License number issued by a DMV)
PersonalRelationship	A personal relationship between the focal living subject and another living subject
classCode [1..1] (M) Role (CS) {CNE:PRS, fixed value= "PRS"}	Structural attribute; this is a "personal relationship" role
id [0..*] Role (SET<II>)	Identifier(s) for this personal relationship
code [1..1] (M) Role (CE) {CWE:PersonalRelationshipRoleType}	A required value specifying the type of personal relationship between the relationshipHolder and the scoping living subject drawn from the PersonalRelationshipRoleType domain, for example, spouse, parent, unrelated friend
statusCode [0..1] Role (CE) {CWE:RoleStatus}	A value specifying the state of this personal relationship (based on the RIM Role class state-machine), for example, following divorce a spouse relationship would be "terminated".
effectiveTime [0..1] Role (IVL<TS>)	An interval of time specifying the period during which this personal relationship is in effect, if such time is applicable and known.
Citizen	Used to capture person information relating to citizenship.
classCode [1..1] (M) Role (CS) {CNE:CIT, fixed value= "CIT"}	Structural attribute; this is a "citizen" role
id [0..*] Role (SET<II>)	Identifier(s) for the focal person as a citizen of a nation
effectiveTime [0..1] Employee (IVL<TS>)	An interval of time specifying the period during which this employment relationship is in effect, if such time limit is applicable and known.
Nation	A politically organized body of people bonded by territory and known as a nation.
classCode [1..1] (M) Organization (CS) {CNE:NAT, fixed value= "NAT"}	Structural attribute; this is a 'nation' type of entity
determinerCode [1..1] (M)	Structural attribute; this is a specific entity

PRPA_HD201301IHE Patient Activate/Revise	This HMD extract defines the message used to report that a new patient record was added, or a patient record was updated. Derived from Figure 3.44.4.1.2-1 (PRPA_RM201301IHE)
Organization (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	
code [1..1] (M) Organization (CD) {CWE:NationEntityType}	A value that identifies a nation state
name [0..1] Organization (ON)	A non-unique textual identifier or moniker for this nation
Employee	A relationship of the focal person with an organization to receive wages or salary. The purpose of this class is to identify the type of relationship the employee has to the employer rather than the nature of the work actually performed. For example, it can be used to capture whether the person is a Military Veteran or not..
classCode [1..1] (M) Employee (CS) {CNE:EMP}	Structural attribute; this is an "employee" role
statusCode [0..1] Employee (CS) {CNE:RoleStatus}	A value specifying the state of this employment relationship (based on the RIM Role class state-machine), for example, active, suspended, terminated.
statusCode [0..1] Employee (CS) {CNE:RoleStatus}	A value specifying the state of this employment relationship (based on the RIM Role class state-machine), for example, active, suspended, terminated.
effectiveTime [0..1] Employee (IVL<TS>)	An interval of time specifying the period during which this employment relationship is in effect, if such time limit is applicable and known.
occupationCode [0..1] Employee (CE) {CWE:EmployeeOccupationCode}	A code qualifying the classification of kind-of-work based upon a recognized industry or jurisdictional standard. OccupationCode is used to convey the person's occupation as opposed to jobClassCode (not used in this transaction) which characterizes this particular job. For example, it can be used to capture whether the person is a Military Veteran or not.
BirthPlace	The birthplace of the focal living subject.
classCode [1..1] (M) Birthplace (CS) {CNE:BIRTHPL}	Structural attribute; this is a "birthplace" role.
id [0..*] Birthplace (SET<II>)	A living subject's birth place represented by a unique identifier.
addr [0..*] Patient (BAG<AD>)	A living subject's birth place represented as an address. Note: Either BirthPlace.addr or an associated Place.name must be valued.
classCode [1..1] (M) Birthplace (CS) {CNE:BIRTHPL}	Structural attribute; this is a "birthplace" role.
LanguageCommunication	A language communication capability of the focal person
languageCode [1..1] (M) LanguageCommunication (CE) {CWE:HumanLanguage}	A value representing a language for which the focal person has some level of proficiency for written or spoken communication. Examples: Spanish, Italian, German, English, American Sign
preferenceInd [0..1] LanguageCommunication (BL)	An indicator specifying whether or not this language is preferred by the focal person for the associated mode

3.44.4.1.2.3 Control Act and Transmission Wrappers

5200   Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.44.4.1.2-2 contains the Transmission and Control Act wrappers used for the two interactions, and the associated constraints.

Table 3.44.4.1.2-2: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000100UV01 – Send Message Payload	MFMI_MT700701UV01 – Master File / Registry Notification Control Act, Role Subject
The value of interactionId SHALL be set to PRPA_IN201301UV02 or PRPA_IN201302UV02 The value of processingModeCode SHALL be set to T The acceptAckCode SHALL be set to AL There SHALL be only one receiver Device	The trigger event code in ControlActProcess.code SHALL be set to PRPA_TE201301UV02 or PRPA_TE201302UV02 respectively RegistrationEvent.statusCode SHALL be set to "active" There SHALL be no InReplacementOf act relationship for these interactions.

5205   The composite message schemas which describe the full payload of these interactions, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The HL7 V3 2008 Normative Edition schemas are at Edition2008/processable/multicacheschemas/PRPA_IN201301UV02.xsd and Edition2008/processable/multicacheschemas/PRPA_IN201302UV02.xsd).

3.44.4.1.2.4 Web Services Types and Messages

5210

The Patient Registry Record Added/Revised messages will be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V.

The following WSDL naming conventions SHALL apply:

```
"add" message     -> "PRPA_IN201301UV02_Message"
"revise" message -> "PRPA_IN201302UV02_Message"
acknowledgement  -> "MCCI_IN000002UV01_Message"
```
5215

The following WSDL snippet describes the types for these messages:

```
     …
 <types>
     <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-
org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201301UV02.xs
d"/>
<xsd:element name="PRPA_IN201301UV02"/>
</xsd:schema>
<xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
```
5220

5225

5230

```
        <xsd:import namespace="urn:hl7-org:v3"
        schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201302UV02.xs
        d"/>
5235    <xsd:element name="PRPA_IN201302UV02"/>
        </xsd:schema>
        <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
        xmlns:hl7="urn:hl7-org:v3">
        <!-- Include the message schema -->
5240    <xsd:import namespace="urn:hl7-org:v3"
        schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/MCCI_IN000002UV01.xs
        d"/>
        <xsd:element name="MCCI_IN000002UV01"/>
        </xsd:schema>
5245      </types>
        …
```

The messages are described by the following snippet:

```
          …
        <message name="PRPA_IN201301UV02_Message">
5250    <part element="hl7:PRPA_IN201301UV02" name="Body"/>
          </message>
          <message name="PRPA_IN201302UV02_Message">
        <part element="hl7:PRPA_IN201302UV02" name="Body"/>
          </message>
5255      <message name="MCCI_IN000002UV01_Message">
        <part element="hl7:MCCI_IN000002UV01" name="Body"/>
          </message>
          …
```

The port types for the WSDL describing the Patient Identity Feed Service are described together
5260 with the expected actions of the actors which receive these messages in Sections 3.44.4.1.3 and
3.44.4.1.4.

3.44.4.1.3 Expected Actions – PIX Manager

The Patient Identifier Cross-reference Manager shall be capable of accepting attributes specified
in Table 3.44.4.1.2-1 above. This is to ensure that the Patient Identifier Cross-reference Manager
5265 can handle a sufficient set of corroborating information in order to perform its cross-referencing
function.

The Patient Identifier Cross-reference Manager shall only recognize a single Patient Identity
Source per domain.

The cross-referencing process (algorithm, human decisions, etc.) is performed within the Patient
5270 Identifier Cross-reference Manager, but its specification is beyond the scope of IHE.

Once the Patient Identifier Cross-reference Manager has completed its cross-referencing
function, it shall make the newly cross-referenced identifiers available to PIX queries and send
out notification to any Patient Identifier Cross-reference Consumers that have been configured as
being interested in receiving such notifications using the PIX Update Notification HL7 V3
5275 transaction (see Section 3.46 for the details of that transaction).

3.44.4.1.3.1 Web Services Port Type and Binding Definitions

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "PIXManager".

The following WSDL naming conventions SHALL apply:

```
        wsdl:definitions/@name="PIXManager":
5280    "add" message    -> "PRPA_IN201301UV02_Message"
        "revise" message -> "PRPA_IN201302UV02_Message"
        acknowledgement  -> "MCCI_IN000002UV01_Message"
        portType         -> "PIXManager_PortType"
        add operation    -> "PIXManager_PRPA_IN201301UV02"
5285    revise operation -> "PIXManager_PRPA_IN201302UV02"
        SOAP 1.2 binding -> "PIXManager_Binding_Soap12"
        SOAP 1.2 port    -> "PIXManager_Port_Soap12"
```

The following WSDL snippets specify the Patient Identity Feed Port Type and Binding
5290   definitions, according to the requirements specified in ITI TF-2x: Appendix V.

3.44.4.1.3.1.1 Port Type

```
   <portType name="PIXManager_PortType">
       <operation name="PIXManager_PRPA_IN201301UV02">
5295 <input message="tns:PRPA_IN201301UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201301UV02"/>
<output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
org:v3:MCCI_IN000002UV01"/>
</operation>
5300 <operation name="PIXManager_PRPA_IN201302UV02">
<input message="tns:PRPA_IN201302UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201302UV02"/>
<output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
org:v3:MCCI_IN000002UV01"/>
5305 </operation>
   </portType>
```

3.44.4.1.3.1.2 Bindings

SOAP 1.2 binding:

```
…
5310   <binding name="PIXManager_Binding_Soap12" type="PIXManager_PortType">
     <wsoap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
     <operation name="PIXManager_PRPA_IN201301UV02">
     <wsoap12:operation soapActionRequired="false"/>
5315   <input>
       <wsoap12:body use="literal"/>
     </input>
     <output>
       <wsoap12:body use="literal"/>
5320   </output>
     </operation>
```

```
            <operation name="PIXManager_PRPA_IN201302UV02">
              <wsoap12:operation soapActionRequired="false"/>
              <input>
5325            <wsoap12:body use="literal"/>
              </input>
              <output>
                <wsoap12:body use="literal"/>
              </output>
5330        </operation>
          </binding>
```
…

An informative WSDL for the PIX Manager implementing the PIXV3 Profile is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

5335 **3.44.4.1.3.2 Message Examples**

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.44.4.1.4 Expected Actions – Document Registry

The Document Registry shall be capable of accepting attributes in the Patient Registry Record Added or Patient Registry Record Revised messages as specified in Table 3.44.4.1.2-1. The
5340 Patient Identity Feed transaction contains more than what the XDS Document Registry needs for its operation.

The Document Registry shall store only the patient identifiers of the patient identification domain designated by the Affinity Domain for document sharing in the registry. Patient identifiers of other patient identification domains, if present in a received message, shall be
5345 ignored.

3.44.4.1.4.1 Web Services Port Type and Binding Definitions

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "DocumentRegistry".

The following WSDL naming conventions SHALL apply:
```
        wsdl:definitions/@name="DocumentRegistry":
5350    "add" message     -> "PRPA_IN201301UV02_Message"
        "revise" message  -> "PRPA_IN201302UV02_Message"
        acknowledgement   -> "MCCI_IN000002UV01_Message"
        portType          -> "DocumentRegistry_PortType"
        add operation     -> "DocumentRegistry_PRPA_IN201301UV02"
5355    revise operation  -> "DocumentRegistry_PRPA_IN201302UV02"
        SOAP 1.2 binding  -> "DocumentRegistry_Binding_Soap12"
        SOAP 1.2 port     -> "DocumentRegistry_Port_Soap12"
```

The following WSDL snippets specify the Patient Identity Feed Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

5360 **3.44.4.1.4.1.1 Port Type**

```
    <portType name="DocumentRegistry_PortType">
```

```
        <operation name="DocumentRegistry_PRPA_IN201301UV02">
     <input message="tns:PRPA_IN201301UV02_Message" wsaw:Action="urn:hl7-
5365 org:v3:PRPA_IN201301UV02"/>
     <output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
     org:v3:MCCI_IN000002UV01"/>
     </operation>
     <operation name="DocumentRegistry_PRPA_IN201302UV02">
5370 <input message="tns:PRPA_IN201302UV02_Message" wsaw:Action="urn:hl7-
     org:v3:PRPA_IN201302UV02"/>
     <output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
     org:v3:MCCI_IN000002UV01"/>
     </operation>
5375   </portType>
```

3.44.4.1.4.1.2 Bindings

SOAP 1.2 binding:

```
…
   <binding name="DocumentRegistry_Binding_Soap12"
5380 type="DocumentRegistry_PortType">
     <wsoap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
     <operation name="DocumentRegistry_PRPA_IN201301UV02">
     <wsoap12:operation soapActionRequired="false"/>
5385     <input>
          <wsoap12:body use="literal"/>
        </input>
        <output>
          <wsoap12:body use="literal"/>
5390     </output>
     </operation>
     <operation name="DocumentRegistry_PRPA_IN201302UV02">
        <wsoap12:operation soapActionRequired="false"/>
        <input>
5395       <wsoap12:body use="literal"/>
        </input>
        <output>
          <wsoap12:body use="literal"/>
        </output>
5400     </operation>
   </binding>
…
```

An informative WSDL for the Document Registry implementing the XDS.b Profile is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

5405 ### 3.44.4.1.4.2 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.44.4.2 Patient Identity Management – Patient Identity Merge

3.44.4.2.1 Trigger Events

When two patients' records are found to identify the same patient by a Patient Identity Source in a Patient Identifier Domain, the Patient Identity Source shall indicate this information using the following trigger:

Patient Registry Duplicates Resolved (PRPA_TE201304UV02)

This trigger event signals that duplicate records were resolved in a patient registry.

A Patient Registry Duplicates Resolved message indicates that the Patient Identity Source has done a merge within a specific Patient Identification Domain. That is, the surviving identifier (patient ID) has subsumed a duplicate patient identifier.

3.44.4.2.2 Message Semantics

The Patient Registry Duplicates Resolved interaction is carried out by the HL7 v3 Patient Demographics message (PRPA_MT201303UV02). The message shall be generated by the system (Patient Identity Source) that performs the update whenever two patient records are found to reference the same person.

The components of the HL7 Merge Patient message listed below are required, and the detailed description of the message is provided in Sections 3.44.4.2.2.1 to 3.44.4.2.2.4.

Each message shall be acknowledged by the HL7 v3 Accept Acknowledgement (MCCI_MT000200UV01), which is described in ITI TF-2x: Appendix O.

When two Patient identifiers are to be merged, the subsumed identifier is referenced in the Registry Trigger Event Control Act Wrapper and the payload is sent for the surviving identifier. For example, if Patients A, B, and C are all to be merged into Patient B, then two messages are sent. In the first message Patient A's identifier is referenced in the Registry Trigger Event Control Act Wrapper via the *replacementOf* act relationship and Patients B's identifier is referenced in the *Patient* class of the payload. In the second message Patient C's identifier is referenced in the wrapper, and Patient B's identifier is, again, in the payload.

The message information model in Section 3.44.4.2.2.2 describes the relevant data elements for this transaction. Specific requirements for the particular actors are found in Section 3.44.4.2.3 Expected Actions.

3.44.4.2.2.1 Major Components of the Patient Registry Duplicates Resolved

Patient

The *Patient* class is the entry point to the R-MIM for the *Patient Demographics (PRPA_RM201303UV02)* in the Patient Identity Source. The patient identifier is represented using an Instance Identifier (II) data type. Please see ITI TF-2x: Appendix E for a detailed description about the use of the HL7 V3 II data type for patient identifiers.

Provider Organization

The Patient class is scoped by the provider organization which is the assigning authority for the patient's identifier. For this message the provider organization class is optional. The HL7 definition of the CMET requires that the provider organization needs to be identified by an id attribute, and at least one of address, telecommunications address, or contact person to be present. The id attribute SHALL have only a root expressed as an ISO OID, and it shall match the root of the Patient.id attribute

Person

The *Person* class contains the name for the focal person (similarly to the requirement for the HL7 v2.x PID segment).

3.44.4.2.2.2 Message Information Model of the Patient Registry Duplicates Resolved Message

Below is the Message Information Model for the Duplicates Resolved message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict subset of the *Patient Demographics (PRPA_RM201303UV02)* RMIM.

The base RMIM can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201303UV.htm. The following restrictions were made on the original RMIMs to arrive at the restricted model:

- The focal entity choice is restricted to be only a person

- All optional classes are removed

- All optional attributes in the Patient and Person class are removed

This restricted model makes clear the purpose of this message – it is to inform about the merge of identities in the Patient Identity Source. If there are any updates to the demographics of the patient in question, this information shall be relayed via a Patient Registry Record Revised message. This follows the semantics of the Patient Identity Feed transaction as defined in ITI TF-2a: 3.8, and is a restriction on the semantics of this message as defined by HL7 (where any demographics information can be updated with the Duplicates Resolved message).

The provider organization is also optionally available.
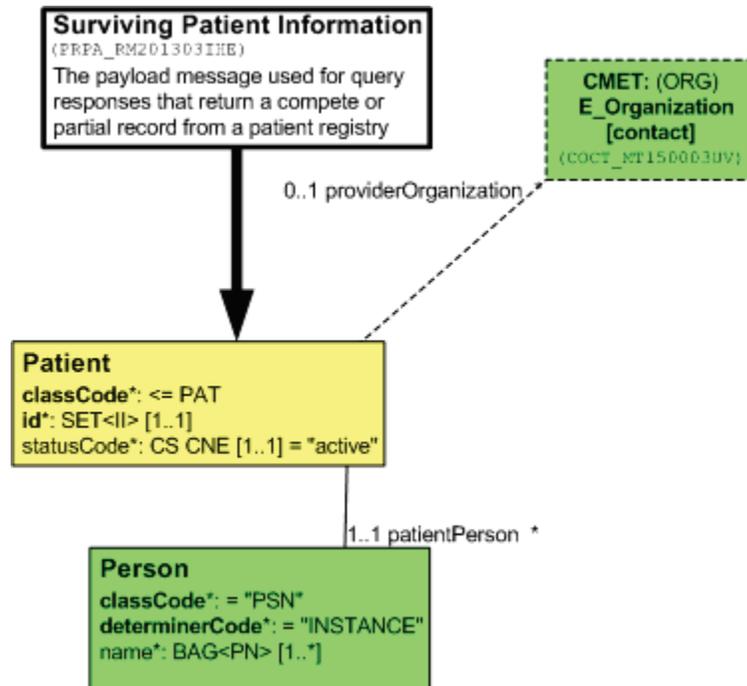
Figure 3.44.4.2.2-1: Message Information Model for Duplicates Resolved Message

The attributes of this model are described in the following table.

Table 3.44.4.2.2-1: Model Attributes

PRPA_HD201303IHE Duplicates Resolved	This HMD extract defines the message used to report that two patient identifiers were merged (i.e., a duplicate was resolved). Derived from Figure 3.44.4.2.2-1 (PRPA_RM201303IHE)
Patient	The primary record for the focal person in a Patient Identity Source
classCode [1..1] (M) Patient (CS) {CNE:PAT}	Structural attribute; this is a "patient" role
id [1..*] (M) Patient (SET<II>)	Identifiers designated by various patient identity sources for the focal person
statusCode [1..1] Patient (CS) {CNE:active, fixed value= "active"}	A value specifying the state of this record in a patient registry (based on the RIM role class state-machine). This record is active.
Person	A subtype of LivingSubject representing a human being Both Person.name and Patient.id must be non-null
classCode [1..1] (M) Person (CS) {CNE:PSN, fixed value= "PSN"}	Structural attribute; this is a "person" entity
determinerCode [1..1] (M) Person (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific person
name [1..*] Person (BAG<PN>)	Name(s) for this person

5475 **3.44.4.2.2.3 Control Act and Transmission Wrappers**

Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.44.4.1.2-2 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

Table 3.44.4.2.2-3: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000100UV01 – Send Message Payload	MFMI_MT700701UV01 – Master File / Registry Notification Control Act, Role Subject
The value of interactionId SHALL be set to PRPA_IN201304UV02 The value of processingModeCode SHALL be set to T The acceptAckCode SHALL be set to AL There SHALL be only one receiver Device	The trigger event code in ControlActProcess.code SHALL be set to PRPA_TE201304UV02 RegistrationEvent.statusCode SHALL be set to "active" There SHALL be an InReplacementOf act relationship The value of PriorRegistration.statusCode SHALL be "obsolete" There SHALL be a PriorRegisteredRole role There SHALL be a single PriorRegisteredRole.id attribute, representing the subsumed patient identifier.

5480

The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The schemas from the HL7 V3 2008 Normative Edition can be found at Edition2008/processable/multicacheschemas/PRPA_IN201304UV02.xsd).

5485 **3.44.4.2.2.4 Web Services Types and Messages**

The Patient Registry Resolve Duplicates message will be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V.

The following WSDL naming conventions SHALL apply:

```
        "resolve duplicates" message -> "PRPA_IN201304UV02_Message"
5490    Acknowledgement              -> "MCCI_IN000002UV01_Message"
```

The following WSDL snippet describes the types for these messages:

```
        …
 <types>
      <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-
5495 org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201304UV02.xs
5500 d"/>
<xsd:element name="PRPA_IN201304UV02"/>
</xsd:schema>
```

```
      <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
      xmlns:hl7="urn:hl7-org:v3">
5505  <!-- Include the message schema -->
      <xsd:import namespace="urn:hl7-org:v3"
      schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/MCCI_IN000002UV01.xs
      d"/>
      <xsd:element name="MCCI_IN000002UV01"/>
5510  </xsd:schema>
        </types>
      …
```

The messages are described by the following snippet:

```
        …
5515    <message name="PRPA_IN201304UV02_Message">
      <part element="hl7:PRPA_IN201304UV02" name="Body"/>
        </message>
        <message name="MCCI_IN000002UV01_Message">
      <part element="hl7:MCCI_IN000002UV01" name="Body"/>
5520    </message>
        …
```

The port types for the WSDL describing the Resolved Duplicates Service are described together with the expected actions of the actors which receive these messages in Section 3.44.4.2.3 and 3.44.4.2.4.

3.44.4.2.3 Expected Actions – PIX Manager

The Patient Identifier Cross-reference Manager shall be capable of accepting attributes in the Resolve Duplicates message as specified in Table 3.44.4.2.2-1.

The Patient Identifier Cross-reference Manager shall perform the Expected Actions similar to the ones specified in ITI TF-2a: 3.8.4.2.3. The particular behavior is described below.

When the Patient Identifier Cross-reference Manager receives the Resolve Duplicates message type of the Patient Identity Feed transaction, it shall cross-reference the patient identifiers provided in the wrapper and the payload of the message by replacing any references it is maintaining internally to the patient ID provided in the wrapper by the patient ID included in the payload. After the identifier references are replaced, the Patient Identifier Cross-reference Manager shall reapply its internal cross-referencing logic/ policies before providing the updated information via either the PIX Query or PIX Notification transactions.

3.44.4.2.3.1 Web Services Port Type and Binding Definitions

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "PIXManager".

The following WSDL naming conventions SHALL apply:

```
      wsdl:definitions/@name="PIXManager":
      "merge" message   -> "PRPA_IN201304UV02_Message"
      acknowledgement   -> "MCCI_IN000002UV01_Message"
      portType          -> "PIXManager_PortType"
      merge operation   -> "PIXManager_PRPA_IN201304UV02"
      SOAP 1.2 binding  -> "PIXManager_Binding_Soap12"
      SOAP 1.2 port     -> "PIXManager_Port_Soap12"
```

The following WSDL snippets specify the Patient Identity Feed Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

3.44.4.2.3.1.1 Port Type

5550

```
<portType name="PIXManager_PortType">
    <operation name="PIXManager_PRPA_IN201304UV02">
<input message="tns:PRPA_IN201304UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201304UV02"/>
<output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
org:v3:MCCI_IN000002UV01"/>
</operation>
    </portType>
```

5555

3.44.4.2.3.1.2 Bindings

5560   SOAP 1.2 binding:

```
…
    <binding name="PIXManager_Binding_Soap12" type="PIXManager_PortType">
      <wsoap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
      <operation name="PIXManager_PRPA_IN201304UV02">
        <wsoap12:operation soapActionRequired="false"/>
        <input>
          <wsoap12:body use="literal"/>
        </input>
        <output>
          <wsoap12:body use="literal"/>
        </output>
      </operation>
    </binding>
…
```

5565

5570

5575

An informative WSDL for the PIX Manager implementing the PIXV3 Profile is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.44.4.2.3.2 Message Examples

5580   Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.44.4.2.4 Expected Actions – Document Registry

The Document Registry shall be capable of accepting attributes in the Resolve Duplicates message as specified in Table 3.44.4.2.2.2-1. Other attributes may exist, but the Document Registry shall ignore them.

5585   The Document Registry shall perform the Expected Actions similar to the ones specified in ITI TF-2a: 3.8.4.2.4. The particular behavior is described below.

When the Document Registry receives the Resolve Duplicates message of the Patient Identity Feed transaction, it shall merge the patient identity specified in the PriorRegistrationRole.id attribute of the Control-Act wrapper (subsumed patient identifier) into the patient identity specified in Patient.id attribute of the message payload (surviving patient identifier) in its registry. After the merge, all Document Submission Sets (including all Documents and Folders beneath them) under the secondary patient identity before the merge shall point to the primary patient identity. The secondary patient identity shall no longer be referenced in the future services provided by the Document Registry.

Changes resulting from a Resolve Duplicates message are not reversible. No un-resolve message is supported by this transaction.

A Resolve Duplicates message contains two attributes of interest:

- PriorRegistrationRole.id – subsumed patient identifier: the patient identifier which is to become obsolete

- Patient.id – surviving patient identifier: the patient identifier which is to remain active.

After a duplicate resolution, the Patient.id attribute represents all records formerly represented by either the Patient.id attribute or the PriorRegistrationRole.id attribute. All other attributes may be ignored.

The following conditions shall be detected by the Document Registry. Messages containing these conditions shall not update the state of the Document Registry.

- The subsumed patient identifier is not issued by the correct Assigning Authority according to the Affinity Domain configuration.

- The surviving patient identifier is not issued by the correct Assigning Authority according to the Affinity Domain configuration.

- The subsumed and surviving patient identifiers are the same.

- The subsumed patient identifier has already been subsumed by an earlier message.

- The surviving patient identifier has already been subsumed by and earlier message.

- The subsumed patient identifier does not convey a currently active patient identifier known to the Document Registry.

If none of the above conditions occur then the Document Registry shall perform the following duties:

1. Records the merge. Only the subsumed and surviving patient identifiers need be remembered. A patient identifier merge affects the processing of future Registry Stored Query [ITI-18] and Register Document Set-b [ITI-42] transactions. See ITI TF-2a: 3.18.4.1.2.3.9 for details of how this message type affects results of a query transaction and Section 3.42.4.1.3.3.2 to see how it affects the Register Document Set-b [ITI-42] transaction.

2. Multiple merge transactions can form a recorded merge chain, where the Subsumed identifier of the current merge is the Surviving identifier of a previous merge.

5625

3. Register Document Set transactions referencing a subsumed identifier are rejected with an XDSUnknownPatientId error.

4. Stored Query transactions referencing a subsumed identifier return no content.

5. Stored Query transactions referencing a surviving identifier successfully match the entire recorded merge chain and return appropriate metadata.

5630

6. No change in the Registry Query transaction.

Note: This transaction does not specify how the merge is to be implemented. It may or may not change the stored form of the metadata. It only specifies the observable results from the perspective of the Registry Stored Query [ITI-18] transaction and the Register Document Set-b [ITI-42].transaction.

3.44.4.2.4.1 Web Services Port Type and Binding Definitions

5635 **IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "DocumentRegistry".**

The following WSDL naming conventions SHALL apply:
```
wsdl:definitions/@name="DocumentRegistry":
"resolve duplicates" message  -> "PRPA_IN201304UV02_Message"
acknowledgement               -> "MCCI_IN000002UV01_Message"
portType                      -> "DocumentRegistry_PortType"
resolve duplicates operation  -> "DocumentRegistry_PRPA_IN201304UV02"
SOAP 1.2 binding              -> "DocumentRegistry_Binding_Soap12"
SOAP 1.2 port                 -> "DocumentRegistry_Port_Soap12"
```
5640

5645 The following WSDL snippets specify the Patient Identity Feed Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

3.44.4.2.4.1.1 Port Type

```
<portType name="DocumentRegistry_PortType">
    <operation name="DocumentRegistry_PRPA_IN201304UV02">
<input message="tns:PRPA_IN201304UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201304UV02"/>
<output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
org:v3:MCCI_IN000002UV01"/>
</operation>
    </portType>
```
5650

5655

3.44.4.2.4.1.2 Bindings

SOAP 1.2 binding:
```
…
  <binding name="DocumentRegistry_Binding_Soap12"
type="DocumentRegistry_PortType">
    <wsoap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
```
5660

```
          <operation name="DocumentRegistry_PRPA_IN201304UV02">
5665  <wsoap12:operation soapActionRequired="false"/>
            <input>
              <wsoap12:body use="literal"/>
            </input>
            <output>
5670          <wsoap12:body use="literal"/>
            </output>
          </operation>
        </binding>
        …
```

5675

An informative WSDL for the Document Registry implementing the XDS.b Profile is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.44.4.2.4.2 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

5680 ### 3.44.5 Security Requirements

This transaction is generally used in profiles that require actors to be grouped with a Secure Node as defined in the Audit Trail and Node Authentication (ATNA) Profile. This use of the ATNA Profile in an XDS Affinity Domain does not require a centralized XDS Affinity Domain Audit Record Repository.

5685 The use of ATNA along with XDS does require that each member of the XDS Affinity Domain have audit and security mechanisms in place. See ITI TF-1: Appendix G and ITI-TF-2x: Appendix K.

The individual actors involved are often members of different secure domains. The data transfers between different secure domains need different protection than transfers within a secure domain 5690 and shall be encrypted with TLS authentication of both hosts.

Transfers within a single secure domain may choose to omit encryption if it is unnecessary, so it is recommended that the online transfer security mechanisms be configurable. Certificate management and exchange is defined as part of the XDS Affinity Domain business relationships and no IHE Integration Profile is specified at this time, see ITI TF-1: Appendix L.

5695 Each transaction will result in audit records describing the transaction. Each secure domain has its own audit server to capture the records for the actors that are within that domain. Access to audit records by other enterprises within the XDS Affinity Domain is managed and controlled by the business relationship terms of the XDS Affinity Domain. There is no automatic IHE transaction for such access.

5700 ### 3.44.5.1 Security Audit Record

When grouped with ATNA Secure Node or Secure Application Actors, this transaction is to be audited as "Patient Record" event, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1. The following tables show items that are required to be part of the audit record for this transaction.

5705 Logically, a merge operation consists of a delete on one patient record, and an update of another patient record. Separate audit records shall be written for the delete operation and the update operation.

3.44.5.1.1 Patient Identity Source audit message

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110110, DCM, "Patient Record")
	EventActionCode	M	"C" (create) , "U" (update), or "D" (delete) as appropriate
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-44", "IHE Transactions", "Patient Identity Feed")
Source (Patient Identity Source Actor) (1)			
Human Requestor (0..n)			
Destination (Patient Identifier Cross-reference Manager or Document Registry) (1)			
Audit Source (Patient Identity Source Actor) (1)			
Patient (1)			

Where:

Source **AuditMessage/** **ActiveParticipant**	*UserID*	*U*	*not specialized*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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*

5710

Destination AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

5715

Patient (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format (see ITI TF-2x: Appendix E)
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=II (the literal string), Value=the value of message.id

3.44.5.1.2 Patient Identifier Cross-reference Manager audit message

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110110, DCM, "Patient Record")
	EventActionCode	M	"C" (create) , "U" (update), or "D" (delete) as appropriate
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-44", "IHE Transactions", "Patient Identity Feed")
Source (Patient Identity Source Actor) (1)			
Destination (Patient Identifier Cross-reference Manager or Document Registry) (1)			
Audit Source (Patient Identifier Cross-reference Manager or Document Registry) (1)			
Patient (1)			

Where:

Source AuditMessage/Activ eParticipantt	*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	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

5720

Patient (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format (see ITI TF-2x: Appendix E).
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=II (the literal string), Value=the value of message.id

3.44.5.1.3 Document Registry audit message

Document Registry audit message are the same as Patient Identifier Cross-reference Manager audit message as presented in Section 3.44.5.1.2.

5725

3.45 PIXV3 Query [ITI-45]

This section corresponds to transaction ITI-45 of the IHE IT Infrastructure Technical Framework. Transaction ITI-45 is used by the Patient Identifier Cross-reference Consumer and Patient Identifier Cross-reference Manager Actors.

5730
3.45.1 Scope

The scope is identical to ITI TF-2a: 3.9.1, PIX Query Scope.

3.45.2 Use Case Roles
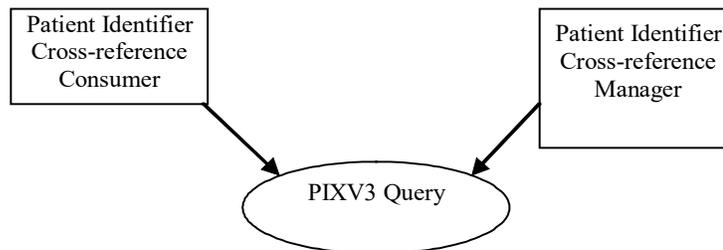
5735 **Actor:** Patient Identifier Cross-reference Consumer

Role: Queries the Patient Identifier Cross-reference Manager for a list of corresponding patient identifiers, if any

> **Corresponding HL7 v3 Application Roles**:

> Patient Registry Query Placer (PRPA_AR201303UV02)

5740 **Actor:** Patient Identifier Cross-reference Manager

Role: Manages the cross-referencing of patient identifiers across Patient Identification Domains. Upon request it returns a list of corresponding patient identifiers, if any.

> **Corresponding HL7 v3 Application Roles:**

> Patient Registry Query Fulfiller (PRPA_AR201304UV02)

5745
3.45.3 Referenced Standards

HL7 Version 3 Edition 2008 Patient Administration DSTU, Patient Topic (found at http://www.hl7.org/memonly/downloads/v3edition.cfm#V32008)

Implementers of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V Web Services for IHE Transactions.

5750 ## 3.45.4 Interaction Diagrams
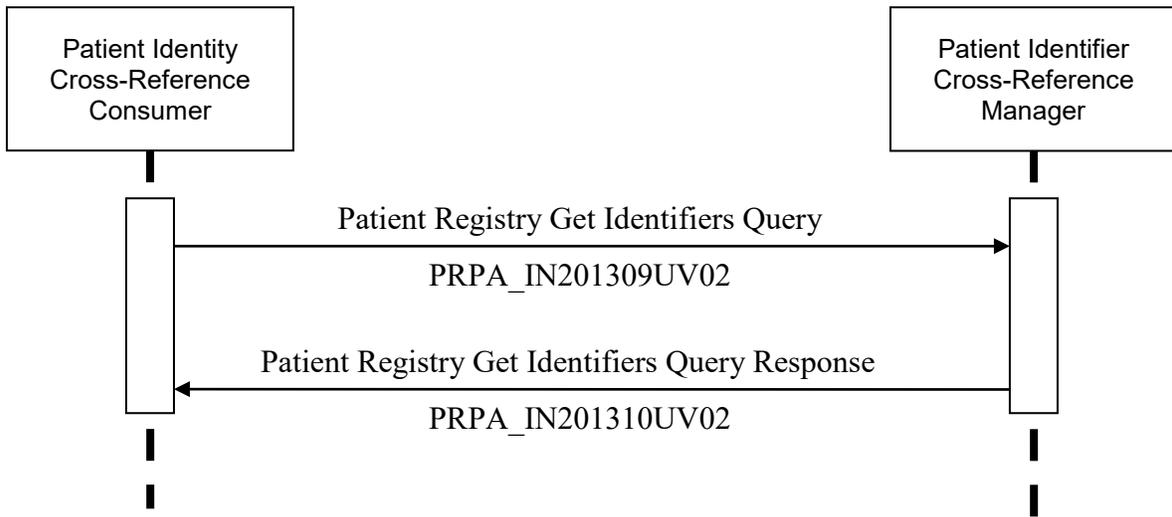
Figure 3.45.4-1: Get Corresponding Identifiers Sequence

3.45.4.1 Get Corresponding Identifiers

3.45.4.1.1 Trigger Events

5755 A Patient Identifier Cross-reference Consumer's need to get the patient identifier associated with a domain for which it needs patient related information will trigger the request for corresponding patient identifiers message based on the following HL7 trigger event:

Patient Registry Get Identifiers Query (PRPA_TE201309UV02)

This query requests all other identifiers associated with a particular person identifier.

5760 ### 3.45.4.1.2 Message Semantics

The Get Corresponding Identifiers transaction is initiated by the HL7 Patient Registry Query by Identifier (PRPA_MT201307UV02) message. The Patient Identifier Cross-reference Consumer shall generate the query message whenever it needs to obtain corresponding patient identifier(s) from other Patient Identification Domain(s). The components of the message listed below are
5765 required, and their detailed descriptions are provided in the following subsections.

The receiver shall respond to the query by sending the Patient Identifiers message (PRPA_MT201304UV02), which uses the Application Level Acknowledgement transmission wrapper. This satisfies the requirements of original mode acknowledgment; no intermediate Accept Acknowledgement message is to be sent. All appropriate identifiers shall be returned in a
5770 single response; therefore no continuation queries are allowed in this transaction.

3.45.4.1.2.1 Major Components of the Patient Registry Query by Identifier

PatientIdentifier Parameter

This required parameter specifies the identifier associated with the person whose information is being queried. For this parameter item, a single patient identifier is specified in the PatientIdentifier.value attribute. Please see ITI TF-2x: Appendix E for the use of the II data type for patient identifiers.

DataSource Parameter

This optional parameter specifies the assigning authority/authorities of the Patient Identity Domain(s) whose identifiers need to be returned. If no such parameter is supplied, the PIX Manager is required to return the identifiers from all known Patient Identity Domains.

3.45.4.1.2.2 Message Information Model of the Patient Registry Query by Identifier Message

Below is the Message Information Model for the Query by Identifier message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict subset of the *Patient Registry Query by Identifier (PRPA_RM201307UV02) RMIM.*

The base RMIM can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201307UV.htm. The following restrictions were made on the original RMIMs to arrive at the restricted model:

- Exactly one PatientIdentifier parameter SHALL be present

- Exactly one PatientIdentifier.value attribute SHALL be present

- If one or more DataSource parameters are present, each SHALL contain exactly one DataSource.value parameter

- The optional attributes ParameterList.id, QueryByParameter responseElementGroupId, QueryByParameter.modifyCode, and QueryByParameter.executionAndDeliveryTime were removed from the model

- QueryByParameter.responsePriorityCode is required and is fixed to I (Immediate)

- QueryByParameter.statusCode is defaulted to "new".
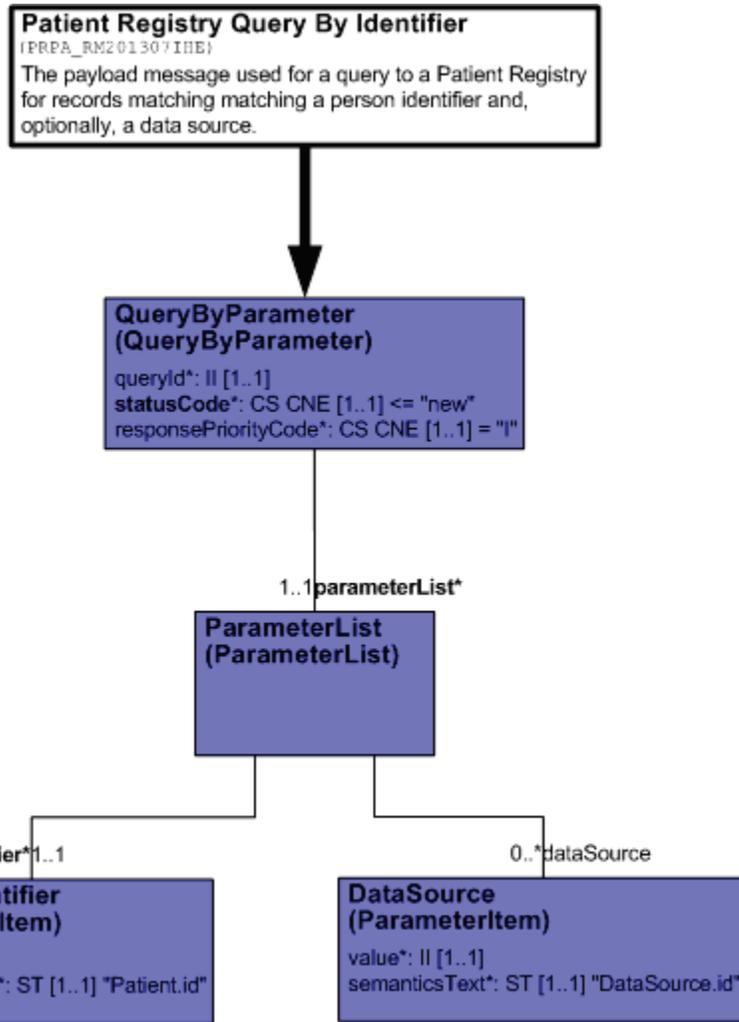
Figure 3.45.4.1.2-1: Message Information Model for the Query by Identifier message

The attributes of this model are described in the following table.

Table 3.45.4.1.2-2: Model Attributes

PRPA_HD201307IHE Patient Registry Query by Identifier	This HMD extract defines the message used to query a patient registry for a list of identifiers. Derived from Figure 3.45.4.1.2-1 (PRPA_RM201307IHE)
QueryByParameter	The entry point for the domain content in this query
queryId [1..1] QueryByParameter (II)	Unique identifier for the query
statusCode [1..1] (M) QueryByParameter (CS) {CNE:QueryStatusCode, fixed value="new"}	There are no continuations necessary for this type of query, so the status is always "new"
responsePriorityCode [1..1] QueryByParameter (CS) {CNE:QueryPriority, fixed value="I"}	The PIX manager is required to send an immediate response.

PRPA_HD201307IHE Patient Registry Query by Identifier	This HMD extract defines the message used to query a patient registry for a list of identifiers. Derived from Figure 3.45.4.1.2-1 (PRPA_RM201307IHE)
DataSource	Optional parameter specifying the assigning authority of a Patient Identity Domain
value [1..1] ParameterItem (II)	The identifier for the Patient Identity Domain's assigning authority. IHE restriction: The value.root attribute SHALL be a valid ISO OID The value.extension attribute SHALL NOT be present
semanticsText [1..1] ParameterItem (ST){default= "DataSource.id"}	
PatientIdentifier	
value [1..1] (M) ParameterItem (II)	The patient identifier known to the PIX Consumer
semanticsText [1..1] ParameterItem (ST){default= "Patient.id"}	

5805   The Patient Identifier Cross-reference Consumer shall provide the patient identifier in the PatientIdentifier.value attribute according to the rules specified in ITI TF-2x: Appendix E.

If the requesting system wishes to select the Patient Identity Domains from which patient identifiers are returned, it does so by sending as many DataSource parameters as domains for which it wants to receive patient identifiers. Each instance of the DataSource parameter shall

5810   provide the Assigning Authority identifier for a specific domain using the DataSource.value attribute. Note that the DataSource.value.extension attribute shall not be provided, and the DataSource.value.root attribute shall contain a valid ISO OID. The responding system shall return the Patient.id value for each requested domain, if a value is known. Note that the value of Patient.id.root attribute shall match the DataSource.value.root attribute representing the

5815   corresponding Assigning Authority.

If no DataSource parameter is specified the Patient Identifier Cross-reference Manager shall return patient identifiers for all domains for which it possesses a corresponding identifier (subject to local publication restrictions).

3.45.4.1.2.3 Control Act and Transmission Wrappers

5820   Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.44.4.1.2-2 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

Table 3.45.4.1.2-4: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000100UV01 – Send Message Payload	QUQI_MT021001UV01 – Query Control Act Request: Query By Parameter
The value of interactionId SHALL be set to PRPA_IN201309UV02	The value of ControlActProcess.moodCode SHALL be set to EVN The trigger event code in ControlActProcess.code

Transmission Wrapper	Trigger Event Control Act Wrapper
The value of processingModeCode SHALL be set to T	SHALL be set to PRPA_TE201309UV02
The acceptAckCode SHALL be set to AL	The value of authorOrPerformer.typeCode SHALL be set to AUT
There SHALL be only one receiver Device	

5825 The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The schemas from the HL7 V3 2008 Normative Edition are at Edition2008/processable/multicacheschemas/PRPA_IN201309UV02.xsd).

3.45.4.1.2.4 Web Services Types and Messages

5830 The Patient Registry Query by Identifier message and response will be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V.

The following WSDL naming conventions SHALL apply:
```
Query by Identifier -> "PRPA_IN201309UV02_Message"
Query Response      -> "PRPA_IN201310UV02_Message"
```

5835 The following WSDL snippet describes the types for these messages:
```
     …
 <types>
     <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-
org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201309UV02.xs
d"/>
<xsd:element name="PRPA_IN201309UV02"/>
</xsd:schema>
<xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201310UV02.xs
d"/>
<xsd:element name="PRPA_IN201310UV02"/>
</xsd:schema>
   </types>
…
```

The messages are described by the following snippet:
```
     …
   <message name="PRPA_IN201309UV02_Message">
<part element="hl7:PRPA_IN201309UV02" name="Body"/>
   </message>
   <message name="PRPA_IN201310UV02_Message">
<part element="hl7:PRPA_IN201310UV02" name="Body"/>
   </message>
```

5865   The port types for the WSDL describing the Resolved Duplicates Service are described together with the expected actions of the actors which receive these messages in Section 3.45.4.1.3.

3.45.4.1.3 Expected Actions

The Patient Identifier Cross-reference Manager shall be capable of accepting attributes as specified in Table 3.45.4.1.2-1 above.

5870   The Patient Identifier Cross-reference Manager shall be capable of accepting multiple concurrent PIX Query requests (Get Corresponding Identifiers messages) and responding correctly using the Return Corresponding Identifiers message.

3.45.4.1.3.1 Web Services Port Type and Binding Definitions

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "PIXManager".

5875   The following WSDL naming conventions SHALL apply:

```
wsdl:definitions/@name="PIXManager":
"get identifiers" query    -> "PRPA_IN201309UV02_Message"
"get identifiers" response -> "PRPA_IN201310UV02_Message"
portType                   -> "PIXManager_PortType"
get identifiers operation  -> "PIXManager_PRPA_IN201309UV02"
SOAP 1.2 binding           -> "PIXManager_Binding_Soap12"
SOAP 1.2 port              -> "PIXManager_Port_Soap12"
```

5880

The following WSDL snippets specify the PIXV3 Query Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

5885

3.45.4.1.3.1.1 Port Type

```
  <portType name="PIXManager_PortType">
    <operation name="PIXManager_PRPA_IN201309UV02">
<input message="tns:PRPA_IN201309UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201309UV02"/>
<output message="tns:PRPA_IN201310UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201310UV02"/>
</operation>
  </portType>
```

5890

5895

3.45.4.1.3.1.2 Bindings

SOAP 1.2 binding:

```
…
  <binding name="PIXManager_Binding_Soap12" type="PIXManager_PortType">
    <wsoap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="PIXManager_PRPA_IN201309UV02">
      <wsoap12:operation soapActionRequired="false"/>
      <input>
        <wsoap12:body use="literal"/>
```

5900

5905

```
        </input>
        <output>
          <wsoap12:body use="literal"/>
        </output>
5910    </operation>
      </binding>
      …
```

An informative WSDL for the PIX Manager implementing the PIXV3 Profile is available online
5915 on the IHE FTP site, see ITI TF-2x: Appendix W.

3.45.4.1.3.2 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.45.4.2 Return Corresponding Identifiers

3.45.4.2.1 Trigger Events

5920 The Patient Identifier Cross-reference Manager's response to the Get Corresponding Identifiers
message will trigger the following message:

Patient Registry Get Identifiers Query Response (PRPA_TE201310UV02)

This query response returns all other identifiers associated with a particular person identifier.

3.45.4.2.2 Message Semantics

5925 The Return Corresponding Identifiers message is conducted by the HL7 Patient Identifiers
message. The Patient Identifier Cross-reference Manager shall generate this message in direct
response to the Patient Registry Query by Identifier message previously received. This message
satisfies the Application Level, Original Mode Acknowledgement for the query message.

3.45.4.2.2.1 Major Components of the Get Corresponding Identifiers Query
5930 Response

Patient

The *Patient* class is the entry point to the R-MIM for the *Patient Identifiers
(PRPA_RM201304UV02)*. This is where at least one of the requested patient IDs will be listed.

Person

5935 The *Person* class contains the name of the patient for additional verification purposes.

Provider Organization

The Patient class is optionally scoped by the provider organization where this person is a patient.
The HL7 definition of the CMET requires that the provider organization needs to be identified
by an id attribute, and at least one of address, telecommunications address, or contact person to
5940 be present. The id attribute SHALL have only a root, expressed as an ISO OID, and at least one

of the id attributes of the Patient class SHALL have a matching root component. See ITI TF-2x: Appendix E on the use of the II data type for patient identifiers.

Other Identifiers

5945   The *OtherIDs* class can optionally be used to capture other identifiers associated with the person such as driver's license number or social security number). It is important to recognize that the HL7 RIM distinguishes between person-level IDs and patient-level IDs. In this transaction, however, the Patient Identity Cross-Reference Manager has the option to send all identifiers in the id attributes of the Patient class. If that is the case, the OtherIDs class shall not be used. For the purposes of interoperability where both HL7 V3 and HL7 v2.x based transactions are used,

5950   and the OtherIDs class is present, the following requirement is imposed on the OtherIDs.id attribute and on the scopingOrganization.id attribute:

> OtherIDs.id.root SHALL be identical to scopingOrganization.id.root

> scopingOrganization.id.extension SHALL NOT have any value

3.45.4.2.2.2 Message Information Model of the Patient Identifiers Message

5955   Below is the Message Information Model for the Patient Identifiers message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict subset of the *Patient Identifiers (PRPA_RM201304UV02)* RMIM.

The base RMIM can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201304UV.htm. The following restrictions were

5960   made on the original RMIMs to arrive at the restricted model:

- The focal entity choice is restricted to be only a person

- All optional classes are removed, except for the provider organization, and other identifiers

- All optional attributes in the Patient and Person class are removed

5965
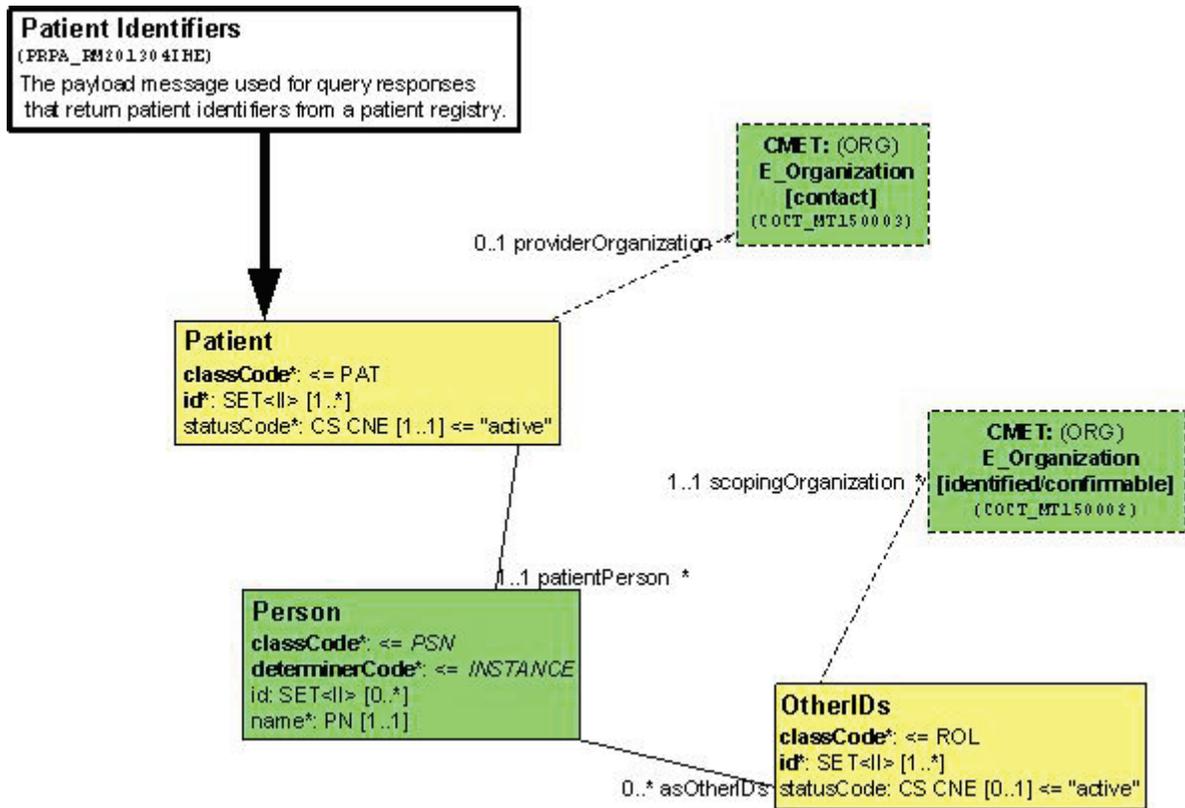
Figure 3.45.4.2.2-1: Message Information Model for the Patient Identifiers Message

The attributes of this model are described in the following table.

5970   **Table 3.45.4.2.2-3: Model Attributes**

PRPA_HD201304IHE PatientIdentifiers	This HMD extract defines the message used to respond to the Patient Registry Query By Identifier Derived from Figure 3.45.4.2.2-1 (PRPA_RM201304IHE)
Patient	The primary record for the focal person in a Patient Identity Cross-Reference Manager
classCode [1..1] (M) Patient (CS) {CNE:PAT}	Structural attribute; this is a "patient" role
id [1..*] (M) Patient (SET<II>)	Linked patient identifiers from one or more Patient Identity Domains
statusCode [1..1] Patient (CS) {CNE:active, fixed value= "active"}	A value specifying the state of this record in a patient registry (based on the RIM role class state-machine). This record is active.
Person	A subtype of LivingSubject representing a human being Both Person.name and Patient.id must be non-null
classCode [1..1] (M) Person (CS) {CNE:PSN, fixed value= "PSN"}	Structural attribute; this is a "person" entity

PRPA_HD201304IHE PatientIdentifiers	This HMD extract defines the message used to respond to the Patient Registry Query By Identifier Derived from Figure 3.45.4.2.2-1 (PRPA_RM201304IHE)
determinerCode [1..1] (M) Person (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific person
name [1..*] Person (BAG<PN>)	Name(s) for this person
OtherIDs	Used to capture additional identifiers for the person such as a Drivers' license or Social Security Number.
classCode [1..1] (M) Role (CS) {CNE:ROL}	Structural attribute. This can be any specialization of "role"
id [1..*] (M) Role (SET<II>)	One or more identifiers issued to the focal person by the associated scopingOrganization (e.g., a Driver's License number issued by a DMV)

3.45.4.2.2.3 Control Act and Transmission Wrappers

Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.44.4.1.2-2 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

5975

Table 3.45.4.4.2-5: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000300UV01 – Send Application Acknowledgement	MFMI_MT700711UV01 – Master File/Registry Query Response Control Act (Role Subject)
The value of interactionId SHALL be set to PRPA_IN201310UV02 The value of processingModeCode SHALL be set to T The acceptAckCode SHALL be set to NE There SHALL be only one receiver Device	The value of ControlActProcess.moodCode SHALL be set to EVN The trigger event code in ControlActProcess.code SHALL be set to PRPA_TE201310UV02 There SHALL be zero or one RegistrationEvents present in this message. If a RegistrationEvent is part of the message, there SHALL be exactly one Patient role present in the payload. There SHALL be no replacementOf act-relationship present in this message There SHALL be a QueryByParameter copy of the original query.

The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The schema from the HL7 V3 2008 Normative Edition are at

5980 Edition2008/processable/multicacheschemas/PRPA_IN201310UV02.xsd).

3.45.4.2.2.4 Web Services Types and Messages

Since this is a response to a query, please see Section 3.45.4.1.2.4 for the web services components of this message.

3.45.4.2.3 Expected Actions - Patient Identifier Cross-reference Manager

5985 The Patient Identifier Cross-reference Manager shall return the attributes within the message that are required by the HL7 standard, as shown in Figure 3.45.4.2.2-1.

A RegistrationEvent, and the associated Patient class are returned only when the Patient Identifier Cross-reference Manager recognizes the specified Patient ID in the query parameter, and an identifier exists for the specified patient in at least one other domain. The Patient

5990 Identifier Cross-reference Manager shall use at one or more Patient.id attributes (and, optionally, zero or more OtherIDs.id attributes) to convey the patient IDs which uniquely identify the patient within each Patient Identification Domain. The identifiers are captured using an Instance Identifier (II) data type. See ITI TF-2x: Appendix E for a detailed description of the use of the II data type for patient identifiers.

5995 It is wholly the responsibility of the Patient Identifier Cross-reference Manager to perform the matching of patient identifiers based on the patient identifier it receives. The information provided by the Patient Identifier Cross-reference Manager to the Patient Identifier Cross-reference Consumer is a list of cross-referenced identifiers in one or more of the domains managed by the Patient Identifier Cross-reference Manager, in addition to the original identifier

6000 used in the query. The identifier used in the query is returned only in the copy of the QueryByParameter parameter list. The list of cross-references is not made available until the set of policies and processes for managing the cross-reference function have been completed. The policies of administering identities adopted by the cooperating domains are completely internal to the Patient Identifier Cross-reference Manager and are outside of the scope of this framework.

6005 Possible matches should not be communicated until the healthcare institution policies and processes embodied in the Patient Identifier Cross-reference Manager reach a positive matching decision.

The Patient Identifier Cross-reference Manager shall respond to the query request as described by the following 6 cases:

6010 **Case 1**: The Patient Identifier Cross-reference Manager recognizes the specified Patient ID sent by the Patient Identifier Cross-reference Consumer in PatientIdentifier.value, and corresponding identifiers exist for the specified patient in at least one of the domains requested in DataSource.value (one identifier per domain). (See Case 6 below for the required behavior if there are multiple identifiers recognized within a given Identifier Domain by the Patient

6015 Identifier Cross-reference Manager.)

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

OK (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper).

A single RegistrationEvent class is returned, where at least one of the identifiers, which the Patient Identifier Cross-reference Manager did recognize as belonging to a requested domain, is

6020 returned in Patient.id. Subsequent such identifiers, if any, are returned in either Patient.id or OtherIDs.id, not including the queried-for patient identifier that is returned in the QueryByParameter parameter list (control act wrapper).

Case 2: The Patient Identifier Cross-reference Manager recognizes the specified Patient ID sent by the Patient Identifier Cross-reference Consumer in PatientIdentifier.value, there are no

6025 specific domains requested in the query (no DataSource parameters are present), and corresponding identifiers exist for the specified patient in at least one other domain known to the Patient Identifier Cross-reference Manager (one identifier per domain).

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

OK (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper).

6030 A single RegistrationEvent class is returned, where at least one of the identifiers, which the Patient Identifier Cross-reference Manager did recognize as belonging to a domain different from the domain of the queried-for patient identifier, is returned in Patient.id. Subsequent such identifiers, if any, are returned in either Patient.id or OtherIDs.id, not including the queried-for patient identifier, which is returned in the QueryByParameter parameter list (control act

6035 wrapper).

Case 3: The Patient Identifier Cross-reference Manager recognizes the specified Patient ID sent in PatientIdentifier.value, but no identifier exists for that patient in any of the domains sent in DataSource.value.

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

6040 **NF** (no data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper).

No RegistrationEvent is returned.

The queried-for patient identifier is returned in the QueryByParameter parameter list (control act wrapper).

6045 **Case 4**: The Patient Identifier Cross-reference Manager does not recognize the Patient ID sent in the PatientIdentifier.value.

AE (application error) is returned in Acknowledgement.typeCode (transmission wrapper) and in QueryAck.queryResponseCode (control act wrapper).

No RegistrationEvent is returned.

6050 The queried-for patient identifier is returned in the QueryByParameter parameter list (control act wrapper).

An AcknowledgmentDetail class is returned in which the attributes typeCode, code, and location are valued as follows.

Attribute	VALUE
typeCode	E

Attribute	VALUE
code	204 (Unknown Key Identifier)
location	XPath expression for the value element of the PatientIdentifier parameter

Case 5: The Patient Identifier Cross-reference Manager does not recognize one or more of the Patient Identification Domains for which an identifier has been requested.

AE (application error) is returned in Acknowledgement.typeCode (transmission wrapper) and in QueryAck.queryResponseCode (control act wrapper).

No RegistrationEvent is returned.

The queried-for patient identification domains are returned in the QueryByParameter parameter list (control act wrapper).

For each domain that was not recognized, an AcknowledgmentDetail class is returned in which the attributes typeCode, code, and location are valued as follows:

Attribute	VALUE
typeCode	E
Code	204 (Unknown Key Identifier)
Location	XPath expression for the value element of the DataSource parameter (which includes the repetition number of the parameter)

Case 6: The Patient Identifier Cross-reference Manager recognizes the specified Patient ID sent by the Patient Identifier Cross-reference Consumer in PatientIdentifier.value, and corresponding identifiers exist for the specified patient in at least one of the domains requested in DataSource.value, and there are multiple identifiers within at least one of the requested domains.

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

OK (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper)

A single RegistrationEvent class is returned, where at least one of the identifiers, which the Patient Identifier Cross-reference Manager did recognize as belonging to a requested domain, is returned in Patient.id. Subsequent such identifiers, if any, are returned in either Patient.id or OtherIDs.id, not including the queried-for patient identifier that is returned in the QueryByParameter parameter list (control act wrapper).

If the Patient Identifier Cross-reference Manager chooses to return multiple identifiers associated with the same domain, it shall return these identifiers either grouped in a single instance of the OtherIDs class, or all represented via repetitions of the Patient.id attribute.

3.45.4.2.3.1 Web Services Port Type and Binding Definitions

The WSDL snippets for this message are shown in Section 3.45.4.1.3.1

3.45.4.2.3.2 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.45.4.2.4 Expected Actions - Patient Identifier Cross-reference Consumer

The Patient Identifier Cross-reference Consumer will use the list of patient identifier aliases
provided by the Patient Identifier Cross-reference Manger to perform the functions, for which it
requested the list. The identifiers found in both Patient.id and OtherIDs.id attributes shall be
considered together to form a complete list of patient identifiers from the different Patient
Identity domains (either requested or available).

In the case where the returned list of identifiers contains multiple identifiers for a single domain,
the Patient Identifier Cross-reference Consumer shall either use ALL of the multiple identifiers
from the given domain or it shall ignore ALL of the multiple identifiers from the given domain.

This allows Patient Identifier Cross-reference Consumers capable of handling multiple identities
for a single patient within a single domain (i.e., those that can correctly aggregate the
information associated with the different identifiers) to do so. For those Patient Identifier Cross-
reference Consumers not capable of handling this situation, ignoring the entire list of different
identifiers prevents the consumer from presenting incomplete data.

3.45.5 Security Requirements

No transaction specific security considerations.

3.45.5.1 Audit Record Considerations

When grouped with ATNA Secure Node or Secure Application Actors, this transaction is to be
audited as "Query Information" event, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1. The
following tables show items that are required to be part of the audit record for this transaction.

3.45.5.1.1 Patient Identifier Cross-reference Consumer audit message:

	Field Name	**Opt**	**Value Constraints**
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-45", "IHE Transactions", "PIX Query")
Source (Patient Identifier Cross-reference Consumer) (1)			
Human Requestor (0..n)			
Destination (Patient Identifier Cross-reference Manager) (1)			
Audit Source (Patient Identity Cross-reference Consumer) (1)			
Patient (0..n)			
Query Parameters (1)			

Where:

Source **AuditMessage/** **ActiveParticipant**	*UserID*	*U*	*not specialized*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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.

6105

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	SOAP 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*

Patient (AuditMessage/ ParticipantObjectIdentif ication)	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 in HL7 CX format (see ITI TF-2x: Appendix E).
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

Query Parameters (AuditMessage/ ParticipantObjectIdentif ication)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-45", "IHE Transactions", "PIX Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	*U*	*not specialized*
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the QueryByParameter segment of the query, base64 encoded

	ParticipantObjectDetail	*U*	*not specialized*

6110 ## 3.45.5.1.2 Patient Identifier Cross-reference Manager audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/ EventIdentification**	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-45", "IHE Transactions", "PIX Query")
Source (Patient Identifier Cross-reference Manager) (1)			
Destination (Patient Identifier Cross-reference Consumer) (1)			
Audit Source (Patient Identifier Cross-reference Manager) (1)			
Patient (0..n)			
Query Parameters (1)			

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	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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/ AuditSourceIdentificati on**	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AuditMessage/ ParticipantObjectIde ntification)**	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 in HL7 CX format (see ITI TF-2x: Appendix E).

	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

6115

|			
Query Parameters (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-45", "IHE Transactions", "PIX Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	*U*	*not specialized*
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the QueryByParameter segment of the query, base64 encoded
	ParticipantObjectDetail	U	*not specialized*

3.46 PIXV3 Update Notification [ITI-46]

This section corresponds to transaction ITI-46 of the IHE IT Infrastructure Technical Framework. Transaction ITI-46 is used by the Patient Identifier Cross-reference Consumer and Patient Identifier Cross-reference Manager Actors.

3.46.1 Scope

The scope is identical to the scope of transaction ITI-10, described in ITI TF-2a: 3.10.1.

3.46.2 Use Case Roles
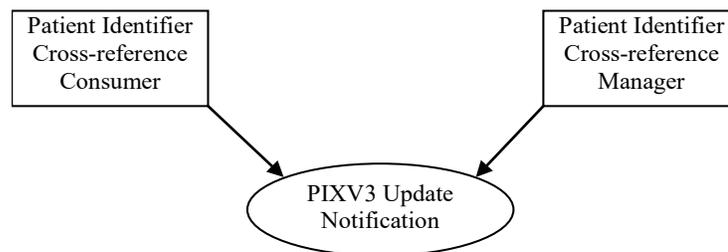
Actor: Patient Identifier Cross-reference Manager

Role: It serves a well-defined set of Patient Identification Domains. The Patient Identifier Cross-reference Manager manages the cross-referencing of patient identifiers across Patient Identification Domains by providing a list of patient ID "aliases" via notification to a configured list of interested Patient Identifier Cross-reference Consumers.

> **Corresponding HL7 v3 Application Roles:**
>
> Patient Registry Informer (PRPA_AR201301UV02)

Actor: Patient Identifier Cross-reference Consumer

Role: Receives notifications from the Patient Identifier Cross-reference Manager of changes to patient ID aliases. Typically the Patient Identifier Cross-reference Consumer uses this information to maintain information links about patients in a different patient ID domain.

> **Corresponding HL7 v3 Application Roles:**
>
> Patient Registry Tracker (PRPA_AR201302UV02)

3.46.3 Referenced Standards

HL7 Version 3 Edition 2008 Patient Administration DSTU, Patient Topic (found at http://www.hl7.org/memonly/downloads/v3edition.cfm#V32008)

Implementers of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V Web Services for IHE Transactions.

3.46.4 Interaction Diagrams
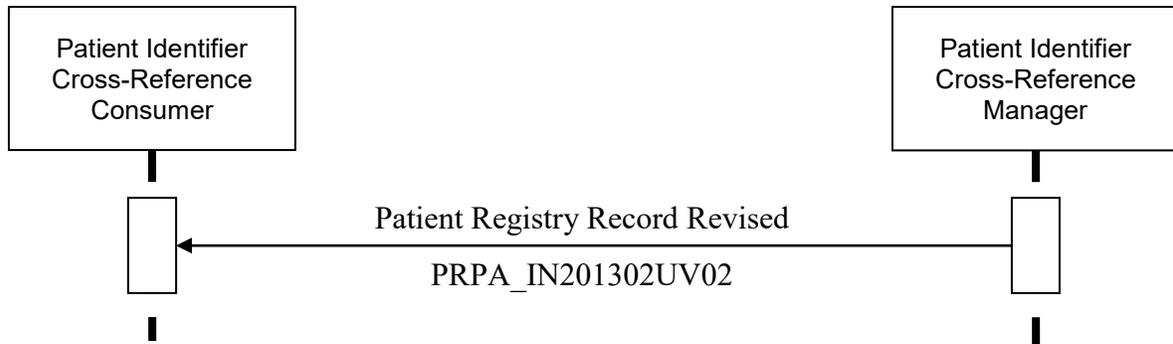
6145

Figure 3.46-1: Update Patient Information Sequence

3.46.4.1 Update Patient Information

3.46.4.1.1 Trigger Events

6150 The Patient Identifier Cross-reference Manager shall notify a Patient Identifier Cross-reference Consumer when there is a change in a set of cross-referenced patient identifiers for any of the patient identifiers belonging to Patient Identifier Domains of interest to the consumer. The configuration of the domains of interest to a Patient Cross-reference Consumer is maintained by the Patient Cross-reference Manager.

6155 Several notifications may have to be issued to communicate a single update to a set of cross-reference patient identifiers as required to reflect all the changes on the resulting sets of cross-reference patient Identifiers belonging to Patient Identifier Domains of interest to the Patient Identifier Cross-referencing Consumer.

The following HL7 trigger event will be used to update to the list of patient identifiers:

Patient Registry Record Revised (PRPA_TE201302UV02)

6160 This trigger event signals that patient information was revised in a patient registry.

3.46.4.1.2 Message Semantics

The PIX Update Notification transaction is conducted by the Patient Revise (PRPA_MT201302UV02) message. The Patient Identifier Cross-reference Manager initiates this transaction whenever identifier list information is updated for a patient.

6165 Each message shall be acknowledged by the HL7 V3 Accept Acknowledgement (MCCI_MT000200UV01), which is described in ITI TF-2x: Appendix O.

It is wholly the responsibility of the Patient Identifier Cross-reference Manager to perform the matching of patient identifiers based on the patient traits it receives. The information provided by the Patient Identifier Cross-reference Manager to Patient Identifier Cross-reference Consumer Actors shall only contain a list of cross-referenced identifiers for the domains of interest as configured with the Patient Identifier Cross-reference Manager in two or more of the domains managed by the Patient Identifier Cross-reference Manager. Multiple notifications may need to be sent. For example:

Consumer CON_A is configured to receive update notifications for domains DOM_A and DOM_AD. Notifications are sent as follows:

- A PIXV3 Patient Registry Record Add message is sent for a patient for DOM_A. The update notification shall contain the patient identifier for DOM_A.

- A PIXV3 Patient Registry Record Add message is processed for DOM_AD. The Patient Identifier Cross-reference Manager cross references this patient with DOM_A. The update notification shall contain the patient identifiers for both DOM_A and DOM_AD.

- A PIXV3 Patient Registry Record Revise message is processed for DOM_AD changing the patient address. The Patient Identifier Cross-reference Manager cross references determines this patient is no longer the same patient as DOM_A. Two update notifications shall be sent. One containing the patient identifier for DOM_A. The other one containing the patient identifier for DOM_AD.

The list of cross-references is not made available until the set of policies and processes for managing the cross-reference function have been completed. The policies of administering identities adopted by the cooperating domains are completely internal to the Patient Identifier Cross-reference Manager and are outside of the scope of this transaction. Possible matches should not be communicated until the healthcare institution policies and processes embodied in the Patient Identifier Cross-reference Manager reach a positive matching decision.

The Patient Identifier Cross-reference Manager shall have configuration indicating which Identity Consumers are interested in receiving the PIXV3 Update Notification transactions. This configuration information shall include identification of the identity consumer systems interested in receiving notifications and, for each of those systems, a list of the patient identifier domains of interest. The Patient Identifier Cross-reference Manager should account for consumers interested in all domains.

Each message shall be acknowledged by the Accept Acknowledgment message sent by the receiver of the Patient Registry Record Revise message to its sender.

3.46.4.1.2.1 Major Components of the Patient Registry Record Revised

Patient

The *Patient* class is the entry point to the R-MIM for the *Patient Revise (PRPA_RM201302UV02)*. This is where the updated list of patient identifiers will be present.

Person

6205 The *Person* class contains the name of the patient for additional verification purposes.

Provider Organization

The Patient class is optionally scoped by the provider organization where this person is a patient. The HL7 definition of the CMET requires that the provider organization needs to be identified by an id attribute, and at least one of address, telecommunications address, or contact person to

6210 be present. The id attribute SHALL have only a root, expressed as an ISO OID, and at least one of the id attributes of the Patient class SHALL have a matching root component (see ITI TF-2x: Appendix E on the use of the II data type for patient identifiers).

Other Identifiers

The *OtherIDs* class can be optionally used to capture other identifiers associated with the person

6215 such as driver's license number or social security number). It is important to recognize that the HL7 RIM distinguishes between person-level IDs and patient-level IDs. In this transaction, however, the Patient Identity Cross-Reference Manager has the option to send all identifiers in the id attributes of the Patient class. If that is the case, the OtherIDs class shall not be used. For the purposes of interoperability where both HL7 V3 and HL7 v2.x based transactions are used,

6220 and the OtherIDs class is present, the following requirement is imposed on the OtherIDs.id attribute and on the scopingOrganization.id attribute:

> OtherIDs.id.root SHALL be identical to scopingOrganization.id.root

> scopingOrganization.id.extension SHALL NOT have any value

3.46.4.1.2.2 Message Information Model of the Patient Registry Record Revise
6225 **Message**

Below is the Message Information Model for the Patient Identifiers message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict subset of the *Patient Revise (PRPA_RM201302UV02)* RMIM.

The base RMIM can be found on the HL7 V3 2008 Edition CD at
6230 Edition2008/domains/uvpa/editable/PRPA_RM201302UV.htm. The following restrictions were made on the original RMIMs to arrive at the restricted model (note that the resulting model is identical to the one described in Section 3.45.4.2.2.2):

- The focal entity choice is restricted to be only a person

- All optional classes are removed, except for the provider organization, and other
6235   identifiers

- All optional attributes in the Patient and Person class are removed
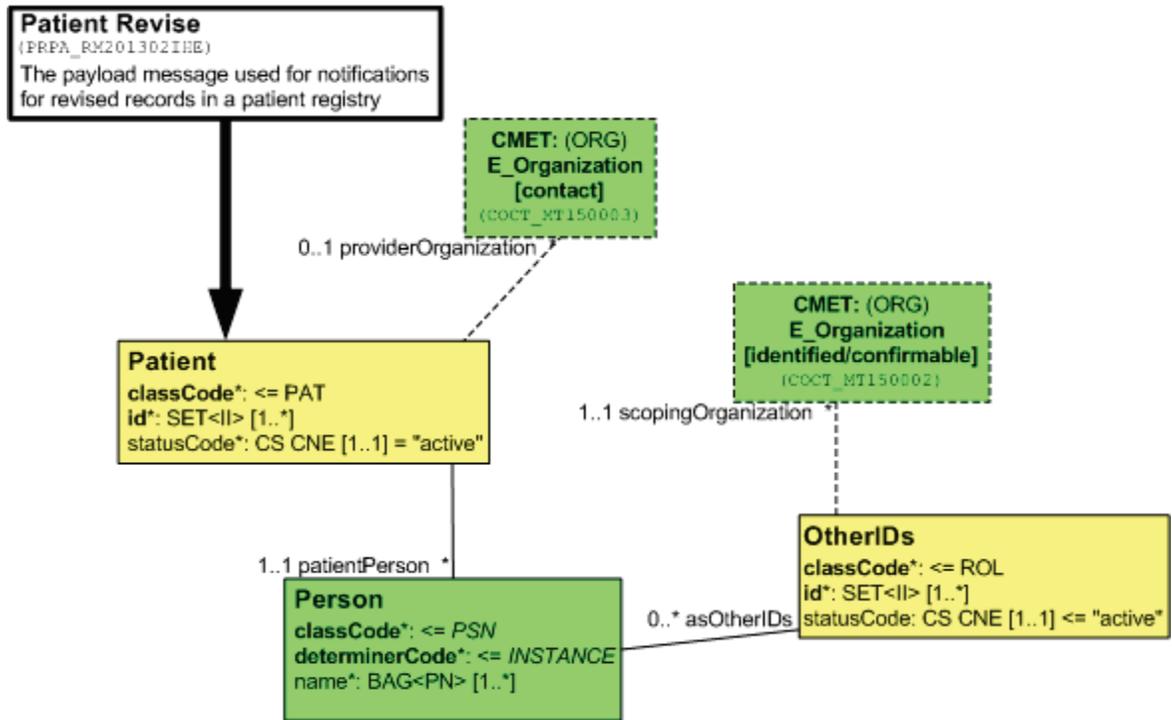
Figure 3.46.4.1.2-1: Message Information Model for the Patient Identifiers Message

6240   The attributes of this model are described in the following table.

Table 3.46.4.1.2-4: Model Attributes

PRPA_HD201302IHE PatientRevise	This HMD extract defines the message used to send a Patient Update Notification Derived from Figure 3.46.4.1.2-1 (PRPA_RM201302IHE)
Patient	The primary record for the focal person in a Patient Identity Cross-Reference Manager
classCode [1..1] (M) Patient (CS) {CNE:PAT}	Structural attribute; this is a "patient" role
id [1..*] (M) Patient (SET<II>)	Linked identifiers from one or more Identity Domains
statusCode [1..1] Patient (CS) {CNE:active, fixed value= "active"}	A value specifying the state of this record in a patient registry (based on the RIM role class state-machine). This record is active.
Person	A subtype of LivingSubject representing a human being Both Person.name and Patient.id must be non-null
classCode [1..1] (M) Person (CS) {CNE:PSN, fixed value= "PSN"}	Structural attribute; this is a "person" entity
determinerCode [1..1] (M) Person (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific person
name [1..*] Person (BAG<PN>)	Name(s) for this person

PRPA_HD201302IHE PatientRevise	This HMD extract defines the message used to send a Patient Update Notification Derived from Figure 3.46.4.1.2-1 (PRPA_RM201302IHE)
OtherIDs	Used to capture additional identifiers for the person such as a Drivers' license or Social Security Number.
classCode [1..1] (M) Role (CS) {CNE:ROL}	Structural attribute. This can be any specialization of "role"
id [1..*] (M) Role (SET<II>)	One or more identifiers issued to the focal person by the associated scopingOrganization (e.g., a Driver's License number issued by a DMV)

3.46.4.1.2.3 Control Act and Transmission Wrappers

Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.46.4.1.2-2 contains the Transmission and Control Act wrappers used for the two interactions, and the associated constraints.

Table 3.46.4.1.2-6: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000100UV01 – Send Message Payload	MFMI_MT700701UV01 – Master File / Registry Notification Control Act, Role Subject
The value of interactionId SHALL be set to PRPA_IN201302UV02 The value of processingModeCode SHALL be set to T The acceptAckCode SHALL be set to AL There SHALL be only one receiver Device	The trigger event code in ControlActProcess.code SHALL be set to PRPA_TE201302UV02 RegistrationEvent.statusCode SHALL be set to "active" There SHALL be no InReplacementOf act relationship for these interactions.

The composite message schemas which describe the full payload of these interactions, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The schema from the HL7 V3 2008 Normative Edition can be found at Edition2008/processable/multicacheschemas/PRPA_IN201302UV02.xsd)

3.46.4.1.2.4 Web Services Types and Messages

The Patient Registry Record Revised message will be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V.

The following WSDL naming conventions SHALL apply:
```
"revise" message -> "PRPA_IN201302UV02_Message"
acknowledgement  -> "MCCI_IN000002UV01_Message"
```

The following WSDL snippet describes the types for these messages:
```
…
 <types>
<xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
```

```
6265    <xsd:import namespace="urn:hl7-org:v3"
        schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201302UV02.xs
        d"/>
        <xsd:element name="PRPA_IN201302UV02"/>
        </xsd:schema>
        <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
6270    xmlns:hl7="urn:hl7-org:v3">
        <!-- Include the message schema -->
        <xsd:import namespace="urn:hl7-org:v3"
        schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/MCCI_IN000002UV01.xs
        d"/>
6275    <xsd:element name="MCCI_IN000002UV01"/>
        </xsd:schema>
          </types>
        …
```

The messages are described by the following snippet:

```
6280          …
          <message name="PRPA_IN201302UV02_Message">
        <part element="hl7:PRPA_IN201302UV02" name="Body"/>
          </message>
          <message name="MCCI_IN000002UV01_Message">
6285    <part element="hl7:MCCI_IN000002UV01" name="Body"/>
          </message>
            …
```

The port types for the WSDL describing the Patient Identity Feed Service are described together with the expected actions of the actors which receive these messages in Section 3.46.4.1.3.

3.46.4.1.3 Expected Actions - Patient Identifier Cross-reference Consumer

Whenever the Patient Identifier Cross-reference Consumer receives updated identifier information in a Patient Revise message that results in a change to the cross-referencing of a patient, the actor shall update its internal identifier information for the affected patient(s) in all domains in which it is interested. The identifiers found in both Patient.id and OtherIDs.id attributes shall be considered together to form a complete list of patient identifiers from the different Patient Identity domains in which this actor is interested.

In the case where the returned list of identifiers contains multiple identifiers for a single domain, the Patient Identifier Cross-reference Consumer shall either use ALL of the multiple identifiers from the given domain or it shall ignore ALL of the multiple identifiers from the given domain.

This allows Patient Identifier Cross-reference Consumers capable of handling multiple identities for a single patient within a single domain (i.e., those that can correctly aggregate the information associated with the different identifiers) to do so. For those Patient Identifier Cross-reference Consumers not capable of handling this situation, ignoring the entire list of different identifiers prevents the consumer from presenting incomplete data.

3.46.4.1.3.1 Web Services Port Type and Binding Definitions

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "PIXConsumer".

The following WSDL naming conventions SHALL apply:

```
wsdl:definitions/@name="PIXConsumer":
PIX update message        -> "PRPA_IN201302UV02_Message"
acknowledgement           -> "MCCI_IN000002UV01_Message"
portType                  -> "PIXConsumer_PortType"
get identifiers operation -> "PIXConsumer_PRPA_IN201302UV02"
SOAP 1.2 binding          -> "PIXConsumer_Binding_Soap12"
SOAP 1.2 port             -> "PIXConsumer_Port_Soap12"
```

6310

6315

The following WSDL snippets specify the Patient Update Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

3.46.4.1.3.1.1 Port Type

6320
```
 <portType name="PIXConsumer_PortType">
      <operation name="PIXConsumer_PRPA_IN201302UV02">
<input message="tns:PRPA_IN201302UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201302UV02"/>
<output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
org:v3:MCCI_IN000002UV01"/>
</operation>
   </portType>
```

3.46.4.1.3.1.2 Bindings

SOAP 1.2 binding:

6330
```
…
 3 <binding name="PIXConsumer_Binding_Soap12" type="PIXConsumer_PortType">
    <wsoap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
      <operation name="PIXConsumer_PRPA_IN201302UV02">
        <wsoap12:operation soapActionRequired="false"/>
        <input>
          <wsoap12:body use="literal"/>
        </input>
        <output>
          <wsoap12:body use="literal"/>
        </output>
      </operation>
    </binding>
…
```

6345 An informative WSDL for the PIX Consumer implementing the PIXV3 Profile is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.46.4.1.3.2 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.46.5 Security Requirements

6350   No transaction specific security considerations.

3.46.5.1 Audit Record Considerations

When grouped with ATNA Secure Node or Secure Application Actors, this transaction is to be audited as "Patient Record" event, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1. The following tables show items that are required to be part of the audit record for this transaction.

6355   ### 3.46.5.1.1 Patient Identifier Cross-reference Manager audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110110, DCM, "Patient Record")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-46", "IHE Transactions", "PIX Update Notification")
Source (Patient Identifier Cross-reference Manager) (1)			
Human Requestor (0..n)			
Destination (Patient Identifier Cross-reference Consumer) (1)			
Audit Source (Patient Identifier Cross-reference Manager) (1)			
Patient IDs (1..n) (represents the components of PID-3)			

Where:

	Field Name	Opt	Value Constraints
Source AuditMessage/ ActiveParticipant	UserID	*U*	*not specialized*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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.

	Field Name	Opt	Value Constraints
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*

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Destination	UserID	M	SOAP endpoint URI.
AuditMessage/ ActiveParticipant	*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	*AuditSourceID*	*U*	*not specialized*
AuditMessage/ **AuditSourceIdentificati on**	*AuditEnterpriseSiteID*	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient IDs	ParticipantObjectTypeCode	M	"1" (Person)
(AuditMessage/ **ParticipantObjectIde ntification)**	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	*M*	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	the patient ID in HL7 CX format (see ITI TF-2x: Appendix E).
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=II (the literal string), Value=the value of message.id

3.46.5.1.2 Patient Identifier Cross-reference Consumer audit message:

	Field Name	Opt	Value Constraints
Event	EventID	M	EV(110110, DCM, "Patient Record")
AuditMessage/ **EventIdentification**	EventActionCode	M	"U" (update)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-46", "IHE Transactions", "PIX Update Notification")
Source (Patient Identifier Cross-reference Manager) (1)			
Destination (Patient Identifier Cross-reference Consumer) (1)			
Audit Source (Patient Identifier Cross-reference Consumer) (1)			
Patient IDs (1..n) (represents the components of PID-3)			

6365   Where:

Source	*UserID*	*U*	*not specialized*
AuditMessage/ **ActiveParticipant**	*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	SOAP endpoint URI.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient IDs (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format (see ITI TF-2x: Appendix E).
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=II (the literal string), Value=the value of message.id

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3.47 Patient Demographics Query HL7 V3 [ITI-47]

This section corresponds to transaction ITI-47 of the IHE Technical Framework. Transaction ITI-47 is used by the Patient Demographics Consumer and Patient Demographics Supplier Actors. Additional components to be included if the Pediatric Demographics Option is supported

6375   are also indicated in Sections 3.47.4.1.2.1 to 3.47.4.1.2.4.

3.47.1 Scope

The scope is identical to ITI TF-2a: 3.21.1.

3.47.2 Use Case Roles
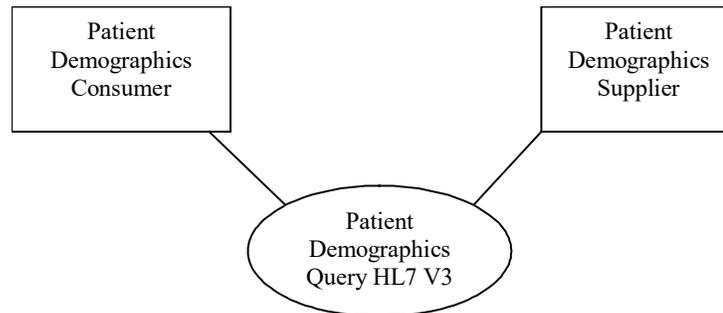
6380 **Actor:** Patient Demographics Consumer

Role: Requests a list of patients matching a minimal set of demographic criteria (e.g., ID or partial name) from the Patient Demographics Supplier. Populates its attributes with demographic information received from the Patient Demographics Supplier.

Corresponding HL7 v3 Application Roles:

6385 Person Registry Query Placer (PRPA_AR201303UV02)

Actor: Patient Demographics Supplier

Role: Returns demographic information for all patients matching the demographic criteria provided by the Patient Demographics Consumer.

Corresponding HL7 v3 Application Roles:

6390 Person Registry Query Fulfiller (PRPA_AR201304UV02)

3.47.3 Referenced Standards

HL7 Version 3 Edition 2008, Patient Administration DSTU, Patient Topic (found at http://www.hl7.org/memonly/downloads/v3edition.cfm#V32008)

Implementers of this transaction shall comply with all requirements described in ITI TF-2x:
6395 Appendix V Web Services for IHE Transactions.

3.47.4 Interaction Diagrams
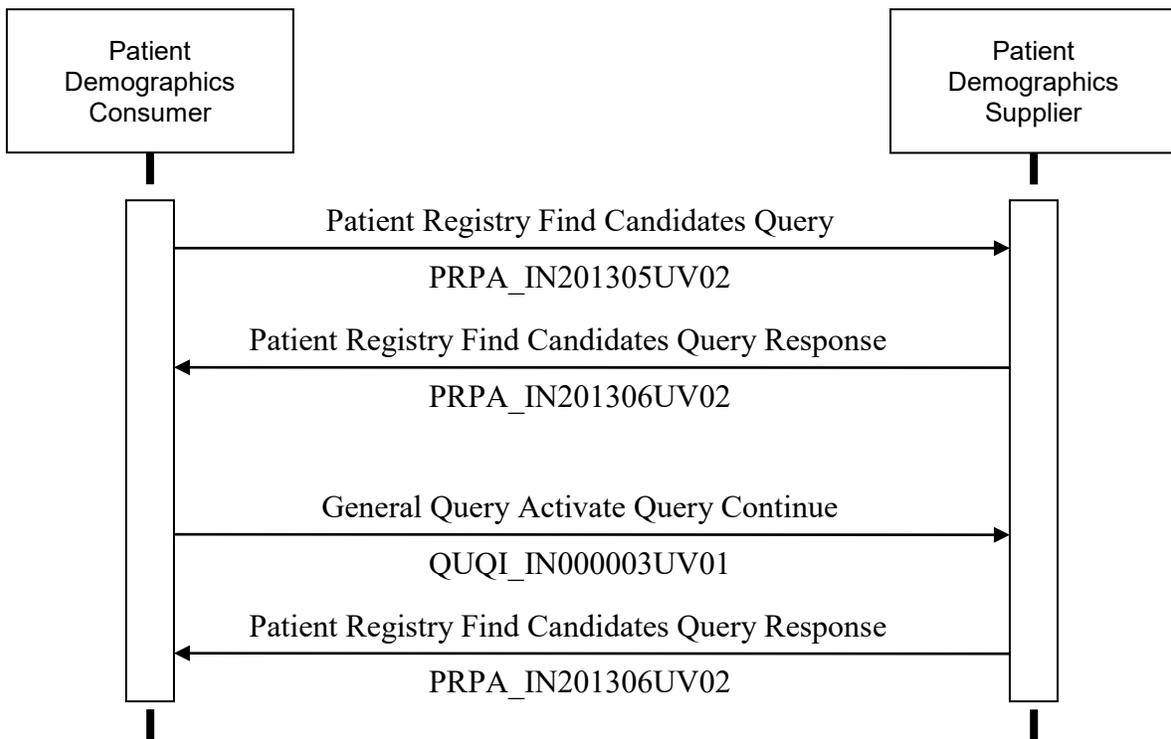
Figure 3.46.4-1: Find Candidates Query

6400 ## 3.47.4.1 Patient Demographics Query

3.47.4.1.1 Trigger Events

A Patient Demographics Consumer's need to select a patient based on demographic information about patients whose information matches a set of known data will trigger the Patient Demographics Query based on the following HL7 trigger event:

6405 **Find Candidates Query (PRPA_TE201305UV02)**

An application, in the role of Query Placer, sends a query-by-parameter message to request that the application return *all* person records that match the demographic information sent in the query parameters.

3.47.4.1.2 Message Semantics

6410 The Find Candidates Query is supported by the Patient Registry Query by Demographics (PRPA_MT201306UV02) message. The Patient Demographics Consumer shall generate the query message whenever it needs to select from a list of patients whose information matches a set of demographic data.

6415 The components of the Patient Registry Query by Demographics message with cardinality greater than 0 (as shown below) are required, and the detailed description of the message is provided in Sections 3.47.4.1.2.1 to 3.47.4.1.2.4. Additional components to be included if the Pediatric Demographics Option is supported are also indicated in Section 3.47.4.1.2.1 to 3.47.4.1.2.4.

6420 The receiver shall respond to the query by sending the Patient Registry Find Candidates Response message (PRPA_MT201310UV02), which uses the Application Level Acknowledgement transmission wrapper. This satisfies the requirements of original mode acknowledgment; no intermediate Accept Acknowledgement is to be sent. The response message shall contain demographic records that reflect the best fit to all of the search criteria received in the Patient Registry Query by Demographics message.

6425 ### 3.47.4.1.2.1 Major Components of the Patient Registry Query by Demographics

LivingSubjectName Parameter

This optional parameter specifies the name of the person whose information is being queried. For this parameter item, a single person name (PN) data item shall be specified in the LivingSubjectName.value attribute. Only certain name parts within the PN data type (e.g., family name) may be specified. If the sender needs to indicate that the name parts specified are not
6430 limited to an exact match, then the *use* attribute of the *value* element shall be set to "SRCH". Handling of phonetic issues, alternate spellings, upper and lower case, partial matching, accented characters, etc. if deemed appropriate, is to be supported by the Patient Demographics Supplier rather than by the Patient Demographics Consumer. The Supplier shall return at least all exact
6435 matches to the query parameters sent by the Consumer. IHE does not further specify matching requirements, however, the MatchAlgorithm parameter may be used to indicate more specific requirements for the Supplier, based on an existing agreement on allowable values for MatchAlgorithm.value.

LivingSubjectAdministrativeGender Parameter

6440 This optional parameter specifies the administrative gender of the person whose information is being queried. For this parameter item, a single administrative gender code shall be specified in the LivingSubjectAdministrativeGender.value attribute.

LivingSubjectBirthTime Parameter

This optional parameter specifies the birth data and time of the person whose information is
6445 being queried. This parameter can convey an exact moment (e.g., January 1, 1960 @ 03:00:00 EST), an approximate date (e.g., January 1960), or even a range of dates (e.g., December 1, 1959 through March 31, 1960).

PatientAddress Parameter

This optional parameter specifies one or more addresses associated with the person whose
6450 information is being queried.

LivingSubjectId Parameter

This optional repeating parameter specifies an identifier associated with the patient whose information is being queried (e.g., a local identifier, or an account identifier). If multiple instances of this parameter are provided in the query, all of the associated identifiers must match.

6455 The identifier specified in the LivingSubjectId.value attribute is expressed using the II data type. Please see ITI TF-2x: Appendix E for the use of the II data type for patient identifiers.

OtherIDsScopingOrganization Parameter

This optional repeating parameter specifies the assigning authority/authorities of the Patient Identity Domain(s) for which identifiers are to be returned. The identifier specified in the

6460 OtherIDsScopingOrganization.value attribute shall be expressed using the II data type, where the *root* element contains a valid ISO OID, and there is no *extension* element. If no such parameter is supplied, the patient demographics supplier is required to return the identifiers from all Patient Identity Domains known to it. Any parameter value which is not recognized by the target patient information source shall cause an error condition.

6465 Additional components to be included if the Pediatric Demographics Option is supported are also indicated below:

MothersMaidenName Parameter

This optional parameter specifies the maiden name of the mother of the person whose information is being queried. For this parameter item, a single person name (PN) data item shall

6470 be specified in the Person.value attribute. Within the PN data type, the given name and family name may be specified. If the sender needs to indicate that the name parts specified are not limited to an exact match, then the use attribute of the value element shall be set to "SRCH".

PatientTelecom Parameter

This optional parameter specifies the primary telephone number or email address of the person

6475 whose information is being queried.

Additional components to be included if the Pediatric Demographics Option is supported are also indicated below:

MothersMaidenName Parameter

This optional parameter specifies the maiden name of the mother of the person whose

6480 information is being queried. For this parameter item, a single person name (PN) data item shall be specified in the Person.value attribute. Within the PN data type, the given name and family name may be specified. If the sender needs to indicate that the name parts specified are not limited to an exact match, then the *use* attribute of the *value* element shall be set to "SRCH".

PatientTelecom Parameter

6485 This optional parameter specifies the primary telephone number or email address of the person whose information is being queried.

3.47.4.1.2.2 Message Information Model of the Patient Registry Query by Demographics Message

Below is the Message Information Model for the Query by Demographics message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict subset of the *Patient Registry Query by Demographics (PRPA_RM201306UV02) RMIM.* If the Pediatric Demographics Option is supported, there are somewhat fewer constraints on the RMIM; these are also indicated.

The base RMIM can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201306UV.htm. The following restrictions were made on the original RMIMs to arrive at the restricted model:

- Exactly one value attribute shall be present in each parameter

- Only the LivingSubjectId, OtherIDsScopingOrganization, and LivingSubjectName parameters can have more than one instance

- The optional attributes ParameterList.id, MatchCriterionList.id, QueryByParameter responseElementGroupId, QueryByParameter.modifyCode, and QueryByParameter.executionAndDeliveryTime were omitted from the model

- QueryByParameter.responsePriorityCode is required and is fixed to I (Immediate)

- QueryByParameter.responseModalityCode is required and is fixed to R (Real Time)

- QueryByParameter.statusCode is defaulted to "new".

- The data type of MatchAlgorithm.value is constrained to ST

- The data type of MinimumDegreeMatch.value is constrained to INT

- The data type of LivingSubjectName.value is constrained to PN

- The optional SortControl was omitted from the model

- The optional MatchWeight was omitted from the model

- The following optional parameters were omitted from the model:

  - PatientTelecom (not omitted if Pediatric Demographics Option is supported)

  - PrincipalCareProviderId

  - PrinicpalCareProvisionId

  - MothersMaidenName (not omitted if Pediatric Demographics Option is supported)

  - LivingSubjectDeceasedTime

  - PatientStatusCode

  - LivingSubjectBirthPlaceName

  - LivingSubjectBirthPlaceAddress

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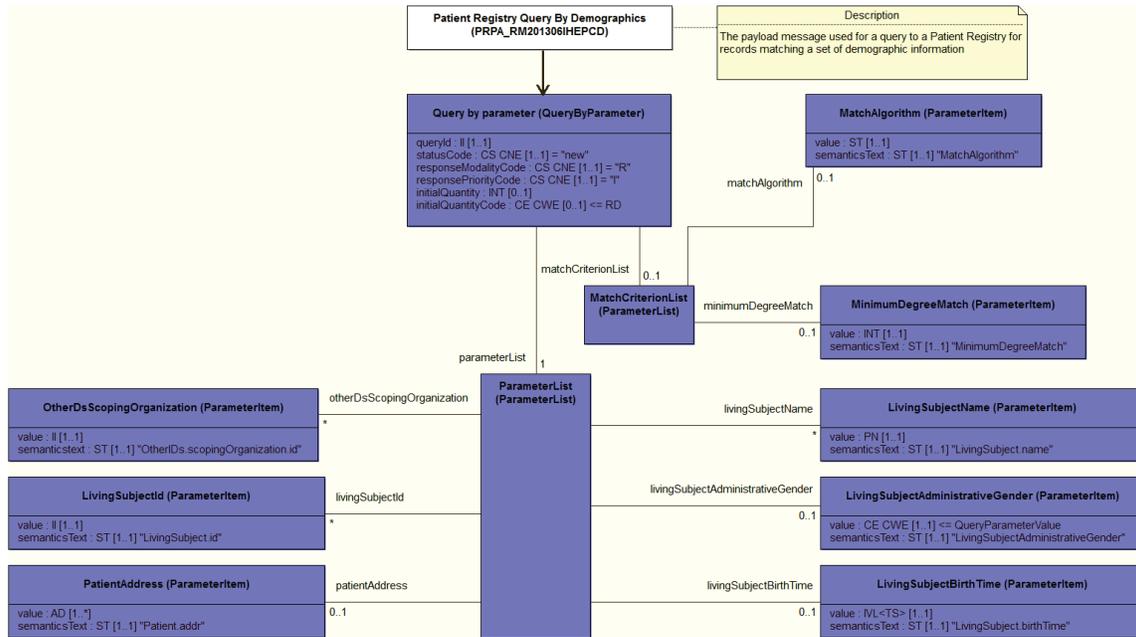
Figure 3.47.4.1.2-1: Message Information Model for the Query by Demographics Message

The attributes of this model are described in the following table:

Table 3.47.4.1.2-1: Model Attributes

PRPA_HD201306IHE Patient Registry Query by Demographics	This HMD extract defines the message used to query a patient registry for records matching a set of demographics information. Derived from Figure 3.47.4.1.2-1 (PRPA_RM201306IHE)
QueryByParameter	The entry point for the domain content in this query
queryId [1..1] QueryByParameter (II)	Unique identifier for the query
statusCode [1..1] (M) QueryByParameter (CS) {CNE:QueryStatusCode, default="new"}	The status of the query, default is "new"
responseModalityCode [1..1] QueryByParameter (CS) {CNE:ResponseModality, fixed value="R"}	The mode of the response – always real-time.
responsePriorityCode [1..1] QueryByParameter (CS) {CNE:QueryPriority, fixed value="I"}	The Patient Demographics Supplier is required to send an immediate response.
initialQuantity [0..1] QueryByParameter (INT)	Defines the maximum size of the response that can be accepted by the requesting application
initialQuantityCode [0..1] QueryByParameter (CE) {CWE:QueryRequestLimit, default="RD"}	Defines the units associated with the initialQuantity; default is "records".

PRPA_HD201306IHE Patient Registry Query by Demographics	This HMD extract defines the message used to query a patient registry for records matching a set of demographics information. Derived from Figure 3.47.4.1.2-1 (PRPA_RM201306IHE)
MatchAlgorithm	This parameter conveys instructions to the patient demographics supplier specifying the preferred matching algorithm to use
value [1..1] ParameterItem (ST)	The name of the algorithm
semanticsText [1..1] ParameterItem (ST){default= "MatchAlgorithm"}	
MinimumDegreeMatch	This parameter conveys instructions to the patient demographics supplier specifying minimum degree of match to use in filtering results
value [1..1] ParameterItem (INT)	The numeric value of the degree of match
semanticsText [1..1] ParameterItem (ST){default= "MatchAlgorithm"}	
LivingSubjectAdministrativeGender	This query parameter is a code representing the administrative gender of a person in a patient registry.
value [1..1] ParameterItem (CE) {CWE:AdministrativeGender}	
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.administrativeGender"}	
LivingSubjectBirthTime	This query parameter is the birth date of a living subject.
value [1..1] ParameterItem (IVL<TS>)	A date or date range. This parameter can convey an exact moment (e.g., January 1, 1960 @ 03:00:00 EST), an approximate date (e.g., January 1960), or even a range of dates (e.g., December 1, 1959 through March 31, 1960).
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.birthTime"}	
LivingSubjectId	
value [1..1] (M) ParameterItem (II)	A patient identifier, used to assist in finding a match for the query.
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.id"}	
LivingSubjectName	This query parameter is the name of a person. If multiple instances of LivingSubjectName are provided, the receiver must consider them as possible alternatives, logically connected with an "or".
value [1..1] ParameterItem (PN)	The name "use" attribute can convey that a name is to be matched using "fuzzy" matching, and does not require exact match. Only some of the name parts may be populated. If, for example, only a family name part of a person's name is sent, then the query would match all persons with that family name regardless of their given names or initials.
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.name"}	
PatientAddress	This query parameter is a postal address for corresponding with a patient. There shall be only a single PatientAddress element

PRPA_HD201306IHE Patient Registry Query by Demographics	This HMD extract defines the message used to query a patient registry for records matching a set of demographics information. Derived from Figure 3.47.4.1.2-1 (PRPA_RM201306IHE)
value [1..*] ParameterItem (AD)	Multiple instances of the value element within a Patient Address may be specified and are combined with OR logic.
semanticsText [1..1] ParameterItem (ST){default= "Patient.addr"}	
OtherIDsScopingOrganization	Optional parameter specifying the assigning authority of a Patient Identity Domain
value [1..1] ParameterItem (II)	The identifier for a Patient Identity Domain's assigning authority. IHE restriction: The value.root attribute SHALL be a valid ISO OID The value.extension attribute SHALL NOT be present
semanticsText [1..1] ParameterItem (ST){default= "OtherIDs.scopingOrganization.id"}	

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When Pediatric Demographics Option is supported, the following sections may be included.

MothersMaidenName	Design Comments: This query parameter is the maiden name of a focal person's mother. It is included as a parameter because it is a common attribute for confirming the identity of persons in some registries. This parameter does not map to a single RIM attribute, instead, in RIM terms Mother's maiden name is the person name part of "family" with an EntityNamePartQualifier of "birth" for the person who is the player in a PersonalRelationship of type of "mother" to the focal person.
value [1..1] ParameterItem (PN)	Design Comments: A person name. In this case it may consist of only the given name part, the family name part, or both.
semanticsText [1..1] ParameterItem (ST){default= "Person.MothersMaidenName"}	
PatientTelecom	Design Comments: This query parameter is a telecommunications address for communicating with a living subject in the context of the target patient registry. It could be a telephone number, fax number or even an email address. There shall be only a single PatientTelecom element.
value [1..*] ParameterItem (TEL)	Design Comments: A telecommunications address. The scheme attribute specifies whether this is a telephone number, fax number, email address, etc. Multiple instances of the value element within a PatientTelecom may be specified and are combined with OR logic.

3.47.4.1.2.3 Control Act and Transmission Wrappers

Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.44.4.1.2-2 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

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Table 3.47.4.1.2-7: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000100UV01 – Send Message Payload	QUQI_MT021001UV01 – Query Control Act Request: Query By Parameter
The value of interactionId SHALL be set to PRPA_IN201305UV02 The value of processingModeCode SHALL be set to T The acceptAckCode SHALL be set to AL There SHALL be only one receiver Device	The value of ControlActProcess.moodCode SHALL be set to EVN The trigger event code in ControlActProcess.code SHALL be set to PRPA_TE201305UV02 If an authorOrPerformer participation is present, the value of authorOrPerformer.typeCode SHALL be set to AUT

The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The
6535   schemas from the HL7 V3 2008 Normative Edition can be found at
Edition2008/processable/multicacheschemas/PRPA_IN201305UV02.xsd)

3.47.4.1.2.4 Web Services Types and Messages

The Patient Registry Query by Demographics message will be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V.

6540   The following WSDL naming conventions SHALL apply:

```
query message    -> "PRPA_IN201305UV02_Message"
```

The following WSDL snippet describes the type for this message:

```
     …
 <types>
<xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201305UV02.xs
d"/>
<xsd:element name="PRPA_IN201305UV02"/>
</xsd:schema>
  </types>
…
```

6555   The message is described by the following snippet:

```
     …
  <message name="PRPA_IN201305UV02_Message">
<part element="hl7:PRPA_IN201305UV02" name="Body"/>
  </message>
     …
```

The port types for the WSDL describing the Patient Demographics Service are described together with the expected actions of the actors which receive these messages in Section 3.47.4.2.3.

3.47.4.1.3 Expected Actions

3.47.4.1.3.1 Immediate Response

The Patient Demographics Supplier shall immediately return a Find Candidates Response message as specified below in Section 3.47.4.2. The response message uses the Application Acknowledgement transmission wrapper, as specified in ITI TF-2x: Appendix O.1.3, and no other acknowledgments are part of this transaction.

3.47.4.1.3.2 Query Parameter Processing

The Patient Demographics Supplier shall be capable of accepting, searching on, and responding with attributes in the Query Person by Demographics message.

Handling of phonetic issues, alternate spellings, upper and lower case, partial matching, accented characters, etc., if deemed appropriate, is to be supported by the Patient Demographics Supplier rather than by the Patient Demographics Consumer. The Supplier shall return at least all exact matches to the query parameters sent by the Consumer; IHE does not further specify matching requirements, except as already discussed in the LivingSubjectName parameter description.

3.47.4.1.3.3 Incremental Response Processing

The Patient Demographics Supplier, which supports the Continuation Option, shall be capable of accepting and processing the *QueryByParameter.responsePriorityCode* attribute. In particular, the Patient Demographics Supplier shall respond in immediate mode.

Also, the Patient Demographics Supplier shall be able to interpret *QueryByParameter.initialQuantity* to return successive responses of partial lists of records. When processing incremental responses, the Patient Demographics Consumer shall request additional responses using the Query Control Act Request Continue/Cancel message (QUQI_MT000001UV01), as described in Section 3.47.4.3.

3.47.4.1.3.4 Web Services Port Type and Binding Definitions

These definitions are part of the query response message. Please see Section 3.47.4.2.3 for more information.

3.47.4.1.3.5 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.47.4.2 Patient Demographics Query Response

3.47.4.2.1 Trigger Events

The Patient Demographics Supplier's response to the Find Candidates Query message is triggered by the following trigger:

Find Candidates Response (PRPA_TE201306UV02)

An application returns a Patient Registry Find Candidates Response message populated with information it holds for *each* person whose record matches the demographic information sent as parameters in a query-by-parameter message.

6600 3.47.4.2.2 Message Semantics

The Patient Registry Find Candidates Response message (PRPA_MT201310UV02) is sent by the Patient Demographics Supplier in direct response to the query (PRPA_MT201306UV02) or, if the Continuation Option is supported, the query continuation (QUQI_MT000001UV01) message previously received. The components of the message with cardinality greater than 0 (as

6605 shown below) are required, and the detailed description of the message is provided in Sections 3.47.4.2.2.1 to 3.47.4.2.2.4. All other attributes of the message are optional.

3.47.4.2.2.1 Major Components of the Patient Registry Find Candidates Response Message

This message shares all the major components of the Patient Activate/Revise messages, as

6610 described in Section 3.44.4.1.2.1. The only additional component is the QueryMatchObservation class.

Query Match Observation

The *QueryMatchObservation* class is used to convey information about the quality of the match for each record returned by the query response.

6615 3.47.4.2.2.2 Message Information Model of the Patient Registry Find Candidates Response Message

Below is the Message Information Model for the Patient Registry Find Candidates Response message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict common subset of the *Patient Registry Find*

6620 *Candidates Response (PRPA_RM201310UV02)* RMIM.

The base RMIM can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201310UV.htm. The following restrictions were made on the original RMIMs to arrive at the restricted model:

- The focal entity choice is restricted to be only a person

6625 - The relationship holder of the personal relationship is restricted to be a person (using CMET COCT_MT030207UV)

- The following roles are omitted:

  - asPatientOfOtherProvider

  - birthPlace

6630 - guarantor

  - guardian

- contactParty

- asMember

- careGiver

6635
- asStudent

- The following participations are omitted:

- subjectOf (administrativeObservation)

- coveredPartyOf (coverage)
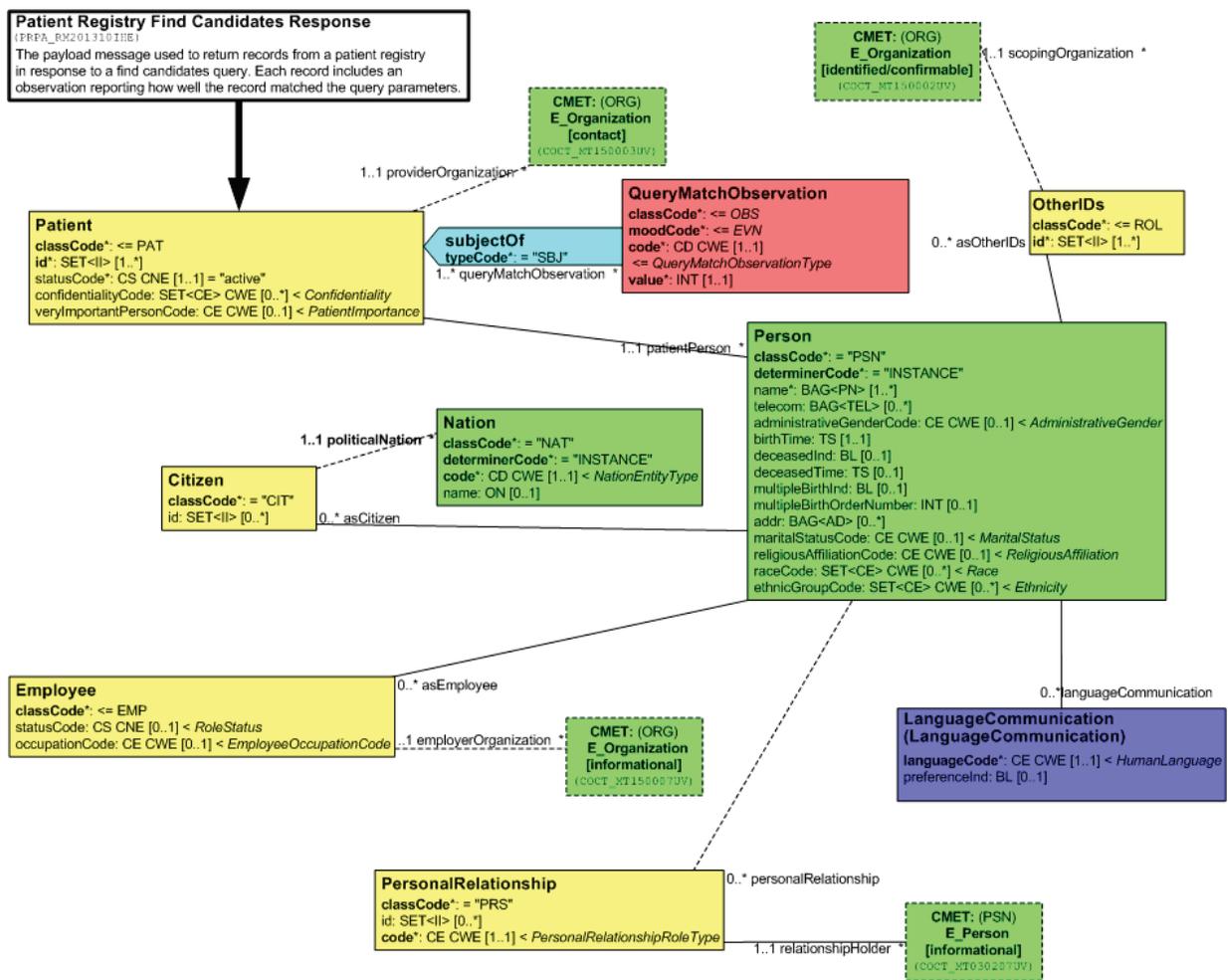
6640
Figure 3.47.4.2.2-1: Message Information Model for the Patient Registry Find Candidates Response Message

The attributes of this model are described in the following table. Note that CMETs are not discussed, as the HL7 definitions for them are being used.

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Table 3.47.4.2.2-8: Model Attributes

PRPA_HD201310IHE Patient Registry Find Candidates Response	This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query. Derived from Figure 3.47.4.2.2-1 (PRPA_RM201310IHE)
Patient	The primary record for the focal person in a Patient Demographics Supplier
classCode [1..1] (M) Patient (CS) {CNE:PAT}	Structural attribute; this is a "patient" role
id [1..*] (M) Patient (SET<II>)	Patient identifiers. Patient Identifiers from different Identity Domains may be contained either here, or in the OtherIDs.id attributes, but not in both places. At least one Patient Identifier shall be present in this attribute
statusCode [1..1] Patient (CS) {CNE:active, fixed value= "active"}	A value specifying the state of this record in a patient registry (based on the RIM role class state-machine). This record is active.
confidentialityCode [0..*] Patient (SET<CE>) {CWE:Confidentiality}	Value(s) that control the disclosure of information about this living subject as a patient
veryImportantPersonCode [0..1] Patient (CE) {CWE:PatientImportance}	A code specifying the patient's special status granted by the scoper organization, often resulting in preferred treatment and special considerations. Examples include board member, diplomat.
Person	A subtype of LivingSubject representing a human being Either Person.name or Patient.id must be non-null
classCode [1..1] (M) Person (CS) {CNE:PSN, fixed value= "PSN"}	Structural attribute; this is a "person" entity
determinerCode [1..1] (M) Person (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific person
name [1..*] Person (BAG<PN>)	Name(s) for this person
telecom [0..*] Person (BAG<TEL>)	Telecommunication address(es) for communicating with this person
administrativeGenderCode [0..1] Person (CE) {CWE:AdministrativeGender}	A value representing the gender (sex) of this person. Note: this attribute does not include terms related to clinical gender which is a complex physiological, genetic and sociological concept that requires multiple observations in order to be comprehensively described.
birthTime [0..1] Person (TS)	The date and time this person was born
deceasedInd [0..1] Person (BL)	An indication that this person is dead

PRPA_HD201310IHE Patient Registry Find Candidates Response	This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query. Derived from Figure 3.47.4.2.2-1 (PRPA_RM201310IHE)
deceasedTime [0..1] Person (TS)	The date and time this person died
multipleBirthInd [0..1] Person (BL)	An indication that this person was part of a multiple birth
multipleBirthOrderNumber [0..1] Person (INT)	The order in which this person was born if part of a multiple birth
addr [0..*] Person (BAG<AD>)	Address(es) for corresponding with this person
maritalStatusCode [0..1] Person (CE) {CWE:MaritalStatus}	A value representing the domestic partnership status of this person
religiousAffiliationCode [0..1] Person (CE) {CWE:ReligiousAffiliation}	A value representing the primary religious preference of this person
raceCode [0..*] Person (SET<CE>) {CWE:Race}	A set of values representing the races of this person
ethnicGroupCode [0..*] Person (SET<CE>) {CWE:Ethnicity}	A set of values representing the ethnic groups of this person
OtherIDs	Used to capture additional identifiers for the person such as a Drivers' license or Social Security Number.
classCode [1..1] (M) Role (CS) {CNE:ROL}	Structural attribute. This can be any specialization of "role" except for Citizen, or Employee.,
id [1..*] (M) Role (SET<II>)	One or more identifiers issued to the focal person by the associated scopingOrganization (e.g., identifiers from a different Patient Identity Domain).
PersonalRelationship	A personal relationship between the focal living subject and another living subject
classCode [1..1] (M) Role (CS) {CNE:PRS, fixed value= "PRS"}	Structural attribute; this is a "personal relationship" role
id [0..*] Role (SET<II>)	Identifier(s) for this personal relationship
code [1..1] (M) Role (CE) {CWE:PersonalRelationshipRoleType}	A required value specifying the type of personal relationship between the relationshipHolder and the scoping living subject drawn from the PersonalRelationshipRoleType domain, for example, spouse, parent, unrelated friend
Citizen	Used to capture person information relating to citizenship.
classCode [1..1] (M) Role (CS) {CNE:CIT, fixed value= "CIT"}	Structural attribute; this is a "citizen" role

PRPA_HD201310IHE Patient Registry Find Candidates Response	This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query. Derived from Figure 3.47.4.2.2-1 (PRPA_RM201310IHE)
id [0..*] Role (SET<II>)	Identifier(s) for the focal person as a citizen of a nation
Nation	A politically organized body of people bonded by territory and known as a nation.
classCode [1..1] (M) Organization (CS) {CNE:NAT, fixed value= "NAT"}	Structural attribute; this is a 'nation' type of entity
determinerCode [1..1] (M) Organization (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific entity
code [1..1] (M) Organization (CD) {CWE:NationEntityType}	A value that identifies a nation state
name [0..1] Organization (ON)	A non-unique textual identifier or moniker for this nation
Employee	A relationship of the focal person with an organization to receive wages or salary. The purpose of this class is to identify the type of relationship the employee has to the employer rather than the nature of the work actually performed. For example, it can be used to capture whether the person is a Military Veteran or not..
classCode [1..1] (M) Employee (CS) {CNE:EMP}	Structural attribute; this is an "employee" role
statusCode [0..1] Employee (CS) {CNE:RoleStatus}	A value specifying the state of this employment relationship (based on the RIM Role class state-machine), for example, active, suspended, terminated.
occupationCode [0..1] Employee (CE) {CWE:EmployeeOccupationCode}	A code qualifying the classification of kind-of-work based upon a recognized industry or jurisdictional standard. OccupationCode is used to convey the person's occupation as opposed to jobClassCode (not used in this transaction) which characterizes this particular job. For example, it can be used to capture whether the person is a Military Veteran or not.
LanguageCommunication	A language communication capability of the focal person
languageCode [1..1] (M) LanguageCommunication (CE) {CWE:HumanLanguage}	A value representing a language for which the focal person has some level of proficiency for written or spoken communication. Examples: Spanish, Italian, German, English, American Sign
preferenceInd [0..1] LanguageCommunication (BL)	An indicator specifying whether or not this language is preferred by the focal person for the associated mode

PRPA_HD201310IHE Patient Registry Find Candidates Response	This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query. Derived from Figure 3.47.4.2.2-1 (PRPA_RM201310IHE)
QueryMatchObservation	Used to convey information about the quality of the match for each record.
classCode [1..1] (M) Observation (CS) {CNE:http://hl7.org/v3ballot2007may/html/infrastructure/vocabulary/ActClass.htm - ActClass, default="OBS"}	Structural attribute – this is an observation
moodCode [1..1] (M) Observation (CS) {CNE:http://hl7.org/v3ballot2007may/html/infrastructure/vocabulary/ActMood.htm - ActMood, default="EVN"}	Structural attribute – this is an event
code [1..1] (M) Observation (CD) {CWE:QueryMatchObservationType}	A code, identifying this observation as a query match observation.
value [1..1] (M) QueryMatchObservation (INT)	A numeric value indicating the quality of match for this record. It shall correspond to the MinimumDegreeMatch.value attribute of the original query, and it shall have the same meaning (e.g., percentage, indicating confidence in the match).

3.47.4.2.2.3 Control Act and Transmission Wrappers

Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.44.4.1.2-2 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

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Table 3.47.4.4.2-9: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000300UV01 – Send Application Acknowledgement	MFMI_MT700711UV01 – Master File/Registry Query Response Control Act (Role Subject)

Transmission Wrapper	Trigger Event Control Act Wrapper
The value of interactionId SHALL be set to PRPA_IN201306UV02	The value of ControlActProcess.moodCode SHALL be set to EVN
The value of processingModeCode SHALL be set to T	The trigger event code in ControlActProcess.code SHALL be set to PRPA_TE201306UV02
The acceptAckCode SHALL be set to NE	There SHALL be zero or more RegistrationEvents present in this message.
There SHALL be only one receiver Device	For each matching record returned, there SHALL be exactly one RegistrationEvent present in this message.
	If a RegistrationEvent is part of the message, there SHALL be exactly one Patient role present in the payload.
	There SHALL be no replacementOf act-relationship present in this message
	There SHALL be a QueryByParameter copy of the original query.
	The QueryAck.resultTotalQuantity, QueryAck.resultCurrentQuantity, and QueryAck.resultRemainingQuantity attributes SHALL have the appropriate values populated.

The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The schemas from the HL7 V3 2008 Normative Edition can be found at

6655 Edition2008/processable/multicacheschemas/PRPA_IN201306UV02.xsd).

3.47.4.2.2.4 Web Services Types and Messages

The Patient Registry Query by Demographics message will be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V.

The following WSDL naming conventions SHALL apply:
6660
```
        response message   -> "PRPA_IN201306UV02_Message"
```

The following WSDL snippet describes the type for these message:
```
       …
 <types>
<xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
6665 xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201306UV02.xsd"/>
<xsd:element name="PRPA_IN201306UV02"/>
6670 </xsd:schema>
   </types>
…
```

The message is described by the following snippet:
```
       …
6675   <message name="PRPA_IN201306UV02_Message">
<part element="hl7:PRPA_IN201306UV02" name="Body"/>
  </message>
       …
```

3.47.4.2.3 Expected Actions

6680 The Patient Demographics Supplier shall perform the matching of patient data based on the query parameter values it receives. The information provided by the Patient Demographics Supplier to Patient Demographics Consumers is a list of possible matching patients from the patient information source associated with the value that the Consumer sent in the *Device* class of the transmission wrapper of the query message.

6685 If *OtherIDsScopingOrganization* parameters were part of the query, and they were recognized by the Patient Demographics Supplier as identifying known Patient Identity Domains, the response will also, for each patient, contain any Patient ID values found in the specified domains.

The mechanics of the matching algorithms used are internal to the Patient Demographics Supplier and are outside of the scope of this framework.

6690 The Patient Demographics Supplier shall respond to the query request as described by the following 3 cases:

Case 1 The Patient Demographics Supplier finds (in the patient information source associated with *Receiver.Device* in the query transmission wrapper) at least one patient record matching the criteria sent in the query parameters. There were no *OtherIDsScopingOrganization* parameters in 6695 the query.

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

OK (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper)

One RegistrationEvent (and the associated Patient role, subject of that event) is returned from the patient information source for each patient record found. If the Patient Demographics Supplier 6700 returns data for multiple patients, it shall return these data in successive occurrences of the RegistrationEvent class within the transmission wrapper.

For each patient, one or more identifiers from the Patient ID Domain associated with the target patient information source identified by *Receiver.Device* are represented as Patient.id attributes.

If an incremental number of records are specified in *QueryByParamter.initialQuantity* (i.e., the 6705 Consumer supports the Continuation Option), and the number of records to be sent exceeds that incremental number, the Supplier shall return only up to the incremental number of records. If the Supplier supports the Continuation Option, it shall correctly populate the *resultTotalQuantity*, *resultCurrentQuantity*, and *resultRemainingQuantity* attributes of the *QueryAck* class in the control act wrapper. If the Supplier does not support the Continuation 6710 Option, in addition to returning only up to the incremental number of records requested, it shall return AE (application error in the Acknowledgement.typeCode (transmission wrapper) and AE (application error) is returned in QueryAck.queryResponseCode (control act wrapper).

The Consumer may then send a query continuation message as a subsequent query request for the next increment of responses.

6715 **Case 2**: The Patient Demographics Supplier finds (in the patient information source associated with *Receiver.Device* in the query transmission wrapper) at least one patient record matching the

criteria sent in the query parameters. One or more *OtherIDsScopingOrganization* parameters are present in the query; the Supplier recognizes all the requested domains.

AA (application accept) is returned in *Acknowledgement.typeCode* (transmission wrapper).

6720 **OK** (data found, no errors) is returned in *QueryAck.queryResponseCode* (control act wrapper)

One *RegistrationEvent* (and the associated *Patient* role, subject of that event) is returned from the patient information source for each patient record found. If the Patient Demographics Supplier returns data for multiple patients, it shall return these data in successive occurrences of the *RegistrationEvent* class within the transmission wrapper.

6725 For each patient, the identifiers from all the Patient ID Domains requested via the *OtherIDsScopingOrganization* parameter are returned either as values of the *Patient.id* attribute, or as values of the *OtherIDs.id* attribute. The same patient identifier value shall not appear in both the Patient.id and OtherIDs.id attributes. The Patient Demographics consumer shall consider the identifiers from both places as equivalently valid. If the Patient Demographics
6730 supplier cannot provide a patient ID for some of the requested Patient ID Domains, then an *OtherIDs.id* attribute shall have an appropriate null value, and the *ScopingOrganization* class shall identify the corresponding domain.

If an incremental number of records are specified in *QueryByParamter.initialQuantity*, and the number of records to be sent exceeds that incremental number, and the Patient Demographics
6735 Supplier supports the Continuation Option, the Supplier returns only the incremental number of records, correctly populating the *resultTotalQuantity*, *resultCurrentQuantity*, and *resultRemainingQuantity* attributes of the *QueryAck* class in the control act wrapper. The consumer will sent a query continuation message as a subsequent query request for the next increment of responses. If the Supplier does not support the Continuation Option, then AE
6740 (application error) is returned in the Acknowledgement.typeCode (transmission wrapper) and AE (application error) is returned in QueryAck.queryResponseCode (control act wrapper).

Case 3: The Patient Demographics Supplier does not recognize one or more *OtherIDsScopingOrganization* parameters as representing valid Patient Identity Domains.

AE (application error) is returned in *Acknowledgement.typeCode* (transmission wrapper) and in
6745 *QueryAck.queryResponseCode* (control act wrapper).

No *RegistrationEvent* is returned.

The queried-for patient identification domains are returned in the *QueryByParameter* parameter list (control act wrapper).

For each domain that was not recognized, an AcknowledgmentDetail class is returned in which
6750 the attributes typeCode, code, and location are valued as follows:

Attribute	VALUE
typeCode	E
code	204 (Unknown Key Identifier)

Attribute	VALUE
location	XPath expression for the value element of the OtherIDsScopingOrganization parameter (which includes the repetition number of the parameter)

3.47.4.2.3.1 Web Services Port Type and Binding Definitions

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "PDSupplier".

The following WSDL naming conventions SHALL apply:

```
wsdl:definitions/@name="PDSupplier":
patient demographics query    -> "PRPA_IN201305UV02_Message"
patient demographics response -> "PRPA_IN201306UV02_Message"
continuation query            -> "QUQI_IN000003UV01_Message"
accept acknowledgement        -> "MCCI_IN000002UV01_Message"
portType                      -> "PDSupplier_PortType"
get candidates operation      -> "PDSupplier_PRPA_IN201305UV02"
continuation operation        ->
"PDSupplier_PRPA_IN201305UV02_Continue"
cancel operation              -> "PDSupplier_PRPA_IN201305UV02_Cancel"
SOAP 1.2 binding              -> "PDSupplier_Binding_Soap12"
SOAP 1.2 port                 -> "PDSupplier_Port_Soap12"
```

The following WSDL snippets specify the Patient Demographics Query Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

3.47.4.2.3.1.1 Port Type

```
 <portType name="PDSupplier_PortType">
     <operation name="PDSupplier_PRPA_IN201305UV02">
<input message="tns:PRPA_IN201305UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201305UV02"/>
<output message="tns:PRPA_IN201306UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201306UV02"/>
</operation>
     <operation name="PDSupplier_QUQI_IN000003UV01_Continue">
<input message="tns:QUQI_IN000003UV01_Message" wsaw:Action="urn:hl7-
org:v3:QUQI_IN000003UV01_Continue"/>
<output message="tns:PRPA_IN201306UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201306UV02"/>
</operation>
     <operation name="PIXManager_QUQI_IN000003UV01_Cancel">
<input message="tns:QUQI_IN000003UV01_Message" wsaw:Action="urn:hl7-org:v3:
QUQI_IN000003UV01_Cancel"/>
<output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
org:v3:MCCI_IN000002UV01"/>
</operation>
   </portType>
```

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3.47.4.2.3.1.2 Bindings

SOAP 1.2 binding:

```
…
6795    <binding name="PDSupplier_Binding_Soap12" type="PDSupplier_PortType">
          <wsoap12:binding style="document"
        transport="http://schemas.xmlsoap.org/soap/http"/>
          <operation name="PDSupplier_PRPA_IN201305UV02">
            <wsoap12:operation soapActionRequired="false"/>
6800        <input>
              <wsoap12:body use="literal"/>
            </input>
            <output>
              <wsoap12:body use="literal"/>
6805        </output>
          </operation>
          <operation name="PDSupplier_QUQI_IN000003UV01_Continue">
            <wsoap12:operation soapActionRequired="false"/>
            <input>
6810          <wsoap12:body use="literal"/>
            </input>
            <output>
              <wsoap12:body use="literal"/>
            </output>
6815      </operation>
          <operation name="PDSupplier_QUQI_IN000003UV01_Cancel">
            <wsoap12:operation soapActionRequired="false"/>
            <input>
              <wsoap12:body use="literal"/>
6820        </input>
            <output>
              <wsoap12:body use="literal"/>
            </output>
          </operation>
6825    </binding>
        …
```

An informative WSDL for the Patient Demographics Supplier implementing the PDQV3 Profile is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.47.4.2.3.2 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.47.4.3 Patient Demographics Query HL7V3 Continuation

3.47.4.3.1 Trigger Events

A Patient Demographics Consumer's need to get another set of matching records to a previously sent Patient Demographics query will trigger the Patient Demographics Query Continuation based on the following HL7 trigger event:

Query General Activate Query Continuation (QUQI_TE000003UV01)

An application, in the role of Query Placer, sends a query continuation message to request that the application return up to a specified number of matching records based on a previous demographics query.

3.47.4.3.2 Message Semantics

The Query continuation is supported by the Query Control Act Request Continue / Cancel (QUQI_MT000001UV01) message. The Patient Demographics Consumer shall generate the continuation message whenever it needs to receive another set of matching records based on the results of a previously sent query.

If the Supplier supports the Continuation Option, it shall respond to the continuation request by sending the Patient Registry Find Candidates Response message (PRPA_MT201310), which uses the Application Level Acknowledgement transmission wrapper. This satisfies the requirements of original mode acknowledgment; no intermediate Accept Acknowledgement is to be sent.

If a cancellation request is sent by the Patient Demographics Consumer, then the receiver shall respond by sending an Accept Acknowledgement (see ITI TF-2x: Appendix O for the descriptions of the Accept Acknowledgement transmission wrapper).

3.47.4.3.2.1 Major Components of the Query Continuation Message

This message contains no domain payload, it is built from a transmission and control act wrappers.

3.47.4.3.2.2 Message Information Model of the Query Continuation Message

Please see ITI TF-2x: Appendix O for the description of the transmission and control act wrappers used by this message. The next section discusses the wrappers, and the specific constraints relevant to this transaction.

3.47.4.3.2.3 Control Act and Transmission Wrappers

Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.47.4.3.2-1 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

Table 3.47.4.3.2-1: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000300UV01 – Send Application Acknowledgement	QUQI_MT000001UV01 – Query Control Act Request Continue / Cancel

Transmission Wrapper	Trigger Event Control Act Wrapper
The value of interactionId SHALL be set to QUQI_IN000003UV01 The value of processingModeCode SHALL be set to T The acceptAckCode SHALL be set to AL There SHALL be only one receiver Device The Acknowledgement.typeCode SHALL be set to AA The TargetMessage.id SHALL be the message ID of the immediately preceding Query response message	The trigger event code in ControlActProcess.code SHALL be set to PRPA_TE000003UV01 QueryContinuation.queryId SHALL be set to the original query identifier

The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The schemas from the HL7 V3 2008 Normative Edition can be found at Edition2008/processable/multicacheschemas/QUQI_IN000003UV01.xsd)

3.47.4.3.2.4 Web Services Types and Messages

The Query Continuation message will be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V.

The following WSDL naming conventions SHALL apply:

```
query continuation   -> "QUQI_IN000003UV01_Message"
```

The following WSDL snippet describes the type for this message:

```
      …
 <types>
<xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/QUQI_IN000003UV01.xs
d"/>
<xsd:element name="QUQI_IN000003UV01"/>
</xsd:schema>
   </types>
…
```

The message is described by the following snippet:

```
      …
   <message name="QUQI_IN000003UV01_Message">
<part element="hl7:QUQI_IN000003UV01" name="Body"/>
   </message>
      …
```

The port types for the WSDL describing the Patient Demographics Service are described together with the expected actions of the actors which receive these messages in Section 3.47.4.2.3.

3.47.4.3.3 Expected Actions

If a number of records is specified in the *initialQuantity* of the original quantity, and the Patient Demographics Supplier supports the Continuation Option, the Patient Demographics Supplier shall return an incremental response of that number of records when the number of matching records it finds exceeds the number of records specified. In subsequent query continuation messages, the Patient Demographics Consumer may specify a different number of records to be returned from now on for this query session by populating the *continuationQuantity* attribute. In addition, the consumer may specify from which record the next set of matches should start by populating the *startResultNumber* attribute. If the Patient Demographics Supplier does not support the Continuation Option and the number of matching records to the original query exceeds the number specified, then, in addition to returning up to that number of records, the Supplier shall return AE (application error) in the Acknowledgement.typeCode (transmission wrapper) and AE (application error) in QueryAck.queryResponseCode (control act wrapper).

The Patient Demographics Supplier shall always populate the *resultTotalQuantity*, *resultCurrentQuantity*, and *resultRemainingQuantity* in the *QueryAck* class. This information will indicate to the Patient Demographics Consumer whether there are any remaining records to be returned in subsequent continuations.

The Patient Demographics Consumer shall indicate a query session cancellation by sending a continuation message, and setting the continuationQuantity attribute to 0, and setting the statusCode to "aborted". In such case, the Patient Demographics Supplier shall respond with an Accept Acknowledgement (as described in ITI TF-2x: Appendix O).

Sending a query cancellation message is optional. The Patient Demographics Supplier may simply not send any continuation messages once a record has been selected. How long the Patient Demographic Supplier retains query results (for incremental response) is an implementation decision and therefore beyond the scope of IHE.

3.47.4.3.3.1 Web Services Port Type and Binding Definitions

This information is part of the specification of the Patient Demographics Query response in Section 3.47.4.2.3.1.

An informative WSDL for the Patient Demographics Supplier implementing the PDQV3 Profile is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.47.4.2.3.2 Message Examples

Message examples can be found online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.47.5 Security Requirements

No transaction specific security considerations.

3.47.5.1 Audit Record Considerations

When grouped with ATNA Secure Node or Secure Application Actors, this transaction is to be audited as "Query Information" event, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1. The following tables show items that are required to be part of the audit record for this transaction.

6935 ### 3.47.5.1.1 Patient Demographics Consumer audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-47", "IHE Transactions", "Patient Demographics Query")
Source (Patient Demographics Consumer) (1)			
Human Requestor (0..n)			
Destination (Patient Demographics Supplier) (1)			
Audit Source (Patient Demographics Consumer) (1)			
Patient (0..n)			
Query Parameters (1)			

Where:

Source AuditMessage/ ActiveParticipant	*UserID*	*U*	*not specialized*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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*

6940

Destination AuditMessage/ ActiveParticipant	UserID	M	SOAP 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/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

6945

Patient (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format (see ITI TF-2x: Appendix E).
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

Query Parameters (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-47", "IHE Transactions", "Patient Demographics Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	*U*	*not specialized*
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the QueryByParameter segment of the query, base64 encoded
	ParticipantObjectDetail	*U*	*not specialized*

3.47.5.1.2 Patient Demographics Source audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-47", "IHE Transactions", "Patient Demographics Query")
Source (Patient Demographics Consumer) (1)			

Destination (Patient Demographics Supplier) (1)
Audit Source (Patient Demographics Supplier) (1)
Patient (0..n)
Query Parameters (1)

6950   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	SOAP endpoint URI
AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
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/ AuditSourceIdentificati on			
AuditSourceID	*U*	*not specialized*
AuditEnterpriseSiteID	*U*	*not specialized*
AuditSourceTypeCode	*U*	*not specialized*

Patient (AuditMessage/ ParticipantObjectIde ntification)			
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 in HL7 CX format (see ITI TF-2x: Appendix E).
ParticipantObjectName	*U*	*not specialized*
ParticipantObjectQuery	*U*	*not specialized*
ParticipantObjectDetail	*U*	*not specialized*

6955

Query Parameters (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-47", "IHE Transactions", "Patient Demographics Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	*U*	*not specialized*
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the QueryByParameter segment of the query, base64 encoded
	ParticipantObjectDetail	*U*	*not specialized*

3.48 Retrieve Value Set [ITI-48]

6960 This section corresponds to transaction ITI-48 of the IHE IT Infrastructure Technical Framework. The Value Set Consumer and Value Set Repository Actors use transaction ITI-48.

3.48.1 Scope

This transaction is used by the Value Set Consumer to retrieve an Expanded Value Set from the Value Set Repository. The Value Set Consumer has previously obtained the Expanded Value Set
6965 OID by means outside of the scope of this transaction. ITI TF-2x: Appendix B has further information about obtaining and managing OIDs which are used as the Value Set Unique ID.

3.48.2 Use case roles
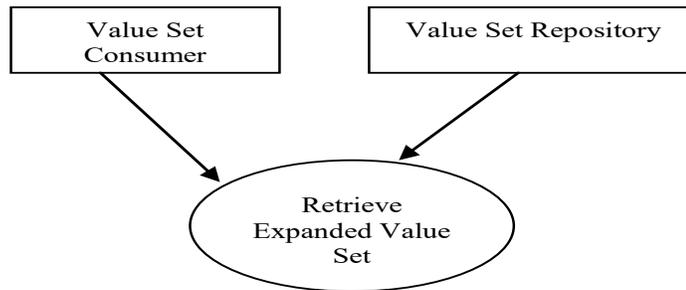
6970

Figure 3.48.2-1: Use Case Roles

SVS Actors:

Actor: Value Set Consumer

Role: Obtains an Expanded Value Set

6975 **Actor:** Value Set Repository

Role: Provides an Expanded Value Set

3.48.3 Referenced Standards

Appendix V	ITI TF-2x: Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use
HL7 v3 Data Type XML ITS	HL7 Version 3 Standard: XML Implementation Technology Specifications – Data Types, R1
HTTP 1.1	IETF RFC2616: Hypertext Transfer Protocol – HTTP 1.1

3.48.4 Interaction Diagram

6980
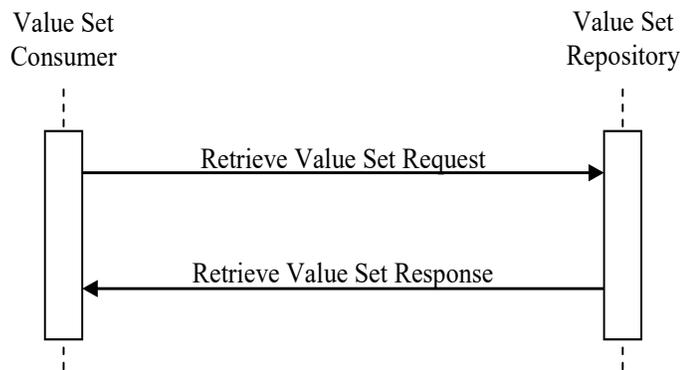
Figure 3.48.4-1: Interaction Diagram

3.48.4.1 Retrieve Value Set Request

3.48.4.1.1 Trigger Events

6985 Having obtained the Value Set OID, the Value Set Consumer will send the Retrieve Value Set Request to the Value Set Repository.

3.48.4.1.2 Message Semantics

The Retrieve Value Set Request shall carry the following information:

- A required `id`, representing the Value Set OID that identifies the Expanded Value Set
6990 within the Repository.

- An optional `version` that identifies a specific version of the Expanded Value Set. If no version is specified, the Value Set Consumer is requesting the most recent version of the Value Set

- An optional `lang` parameter indicating the requested language locale for the
6995 `displayName` of the Value Set Concepts. (Note: in the SOAP binding, this parameter is represented via the `xml:lang` XML attribute)

Section 3.48.5 describes the Web Services protocol requirements and the format of the message in full detail.

3.48.4.1.3 Expected Actions

7000   When receiving a Retrieve Value Set Request, a Value Set Repository shall generate a Retrieve Value Set Response containing the Expanded Value Set that corresponds to the request parameters or an error code if the Value Set could not be retrieved. If no version is specified in the Request, then the most recent version shall be returned.

The Value Set Repository shall support both the SOAP and HTTP bindings for this transaction.
7005   If the Value Set Consumer sends the request using the SOAP binding, the Value Set Repository shall respond using the SOAP binding. If the Value Set Consumer sends the request using the HTTP binding, the Value Set Repository shall respond using the HTTP binding.

3.48.4.2 Retrieve Value Set Response

3.48.4.2.1 Trigger Events

7010   This message will be triggered by a Retrieve Value Set Request Message.

3.48.4.2.2 Message Semantics

The Retrieve Value Set Response Message shall carry the following information for the returned Expanded Value Set:

- A required `id`, representing the Value Set OID that identifies the Value Set within the
7015   Value Set Repository. This OID shall be the same as the Value Set OID in the received Retrieve Value Set Request Message.

- A required `displayName` that can be used for display purposes.

- An optional version that shall be present if the Expanded Value Set has a version, that identifies the specific version of the Value Set returned.

7020   - An optional `cacheExpirationHint` indicating that the Value Set Consumer is not expected to change before this date and time. If the request and the response use the HTTP binding, this information shall be also present in the HTTP *Expire* header of the response. For details, please see Sec. 14.21 of IETF RFC2616.

- One or more `ConceptList`, which provides the Concepts of the Expanded Value Set.
7025   If there are multiple translations of the Value Set, each translation is returned as a separate `ConceptList`, where only the `displayName` of each Concept, and the language locale represented by `xml:lang` are different.

For each Value Set Concept, the following is returned. These requirements override the requirements of the HL7 schema rules for the CE data type where they conflict.

7030   - A required `code` (a code that uniquely identifies a class or concept within the context of a code system)

- A required `displayName` (the name of the concept)

- A required `codeSystem` (the terminology the concept comes from)

7035

- An optional `codeSystemVersion`. (the version of the terminology the concept comes from)

Section 3.48.5 describes the Web Services requirements and the format of the message in full detail.

3.48.4.2.3 Expected Actions

A Value Set Repository shall return the Expanded Value Set indicated in the request.

7040 If the Value Set Consumer requested a specific language locale, the Value Set Repository shall return only the requested translation of the Expanded Value Set. If the Value Set Consumer did not request a specific language locale, the Value Set Repository shall return all known translations of the Expanded Value Set. This is the only case where more than one ConceptList XML element shall be permitted. The ConceptList shall have the same code values for the Value

7045 Set in question; the displayName may have a different value appropriate to the locale.

The Value Set Repository shall return the Expanded Value Set or an error code in case the Value Set could not be expanded. The following error responses may be returned:

1. **For the SOAP binding:**

   a. A SOAP fault, whose code value is NAV, with the reason being: "Unknown value

7050   set".

   b. A SOAP fault, whose code value is VERUNK, with the reason being: "Version unknown".

2. **For the HTTP binding:**

   a. An HTTP status code of 404, with an HTTP Warning header containing warn-

7055   code of 111, and warn-text of "NAV: Unknown value set". See sections 10.4.5 and 14.46 of IETF RFC2616 for more information.

   b. An HTTP status code of 404, with an HTTP Warning header containing warn-code of 112, and warn-text of "VERUNK: Version unknown". See sections 10.4.5 and 14.46 of IETF RFC2616 for more information.

7060 ### 3.48.5 Protocol Requirements

The protocol for the Retrieve Value Set transaction describes two bindings. The first is based on SOAP 1.2, and the second is an HTTP binding. The relevant XML namespace definitions can be seen in Table 3.48.5-1 WSDL Namespace Definitions.

Table 3.48.5-1: WSDL Namespace Definitions

soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2006/05/addressing/wsdl/

xsd	http://www.w3.org/2001/XMLSchema
ihe	urn:ihe:iti:svs:2008

7065 **3.48.5.1 SOAP Binding**

Value Set Consumers which support the SOAP Binding Option shall follow the rules for Web Services transactions outlined in ITI TF-2x: Appendix V. These are the requirements for the Retrieve Value Set transaction presented in the order in which they would appear in the WSDL definition:

7070 The following types shall be imported (xsd:import) in the /definitions/types section:

namespace="`urn:ihe:iti:svs:2008`", schema="SVS.xsd"

The `/definitions/message/part/@element` attribute of the Retrie3ve Value Set Request message shall be defined as "`ihe:RetrieveValueSetRequest`"

The `/definitions/message/part/@element` attribute of the Retrieve Value Set
7075 Response message shall be defined as "`ihe:RetrieveValueSetResponse`"

The `/definitions/portType/operation/input/@wsaw:Action` attribute for the Retrieve Value Set Request message shall be defined as "`urn:ihe:iti:2008:RetrieveValueSet`"

The `/definitions/portType/operation/output/@wsaw:Action` attribute for the
7080 Retrieve Value Set Response message shall be defined as "`urn:ihe:iti:2008:RetrieveValueSetResponse`"

The `/definitions/binding/operation/soap12:operation/@soapActionRequi red` attribute shall be defined as "`false`"

7085 These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. Full sample request and response messages are in Section 3.48.5.3 Sample SOAP Message.

Within the request message payload the `<ihe:RetrieveValueSetRequest/>` element is defined as:

7090 • A required `/ihe:RetrieveValueSetRequest/ihe:ValueSet` element

• A required `/ihe:RetrieveValueSetRequest/ihe:ValueSet@id` attribute that contains the ID of the requested Value Set within the Value Set Repository. The Value Set ID shall be formatted as an ISO OID.

• An optional
7095 `/ihe:RetrieveValueSetRequest/ihe:ValueSet@displayName` attribute

• An optional `/ihe:RetrieveValueSetRequest/ihe:ValueSet@version` attribute.

- • An optional `/ihe:RetrieveValueSetRequest/ihe:ValueSet@xml:lang` attribute.

7100 Value Set Repositories shall include within the response message payload for the SOAP Binding Option the `<ihe:RetrieveValueSetResponse/>` element which contains:

An optional `/ihe:RetrieveValueSetResponse@cacheExpirationHint` attribute, indicating that the Value Set Consumer should obtain a new copy before this date and time.

A required `/ihe:RetrieveValueSetResponse/ihe:ValueSet` element, containing

7105
- • a required `/ihe:RetrieveValueSetResponse/ihe:ValueSet@id` attribute

- • a required `/ihe:RetrieveValueSetResponse/ihe:ValueSet@displayName` attribute

- • an optional `/ihe:RetrieveValueSetResponse/ihe:ValueSet@version` attribute

7110
- • one or more `/ihe:RetrieveValueSetResponse/ihe:ValueSet/ihe:ConceptList` element, containing:

- • `/ihe:RetrieveValueSetResponse/ihe:ValueSet/ihe:ConceptList/ xml:lang` attribute, representing the language locale of the Concept's display names

7115
- • one or more `/ihe:RetrieveValueSetResponse/ihe:ValueSet/ihe:ConceptList/ ihe:Concept` elements, representing the concepts within the value set.

The <ihe:Concept/> element is defined as being of the HL7 V3 CE data type.

The only occurrence of more than one `ConceptList` element in a response message shall be
7120 for the purpose of returning multiple language representations of the same value set.

A full XML Schema Document for the SVS types is available on the IHE ftp site (see ITI TF-2x: Appendix W).

3.48.5.2 HTTP Binding

Value Set Consumers which support the HTTP Binding Option shall use the GET method as
7125 defined in IETF RFC2616 for the Retrieve Value Set Request.

3.48.5.2.1 Request Parameters

There are three input parameters, to be provided as part of the URL in the GET request. The parameter values have identical meaning to the ones described in the SOAP binding. These are described in Table 3.48.5.2.1-1.

7130 **Table 3.48.5.2.1-1: The Request Parameters in the RetrieveMultipleValueSets request**

Parameter	Optionality	Note
Id	Required	Unique identifier of the Value Set.
Version	Optional	The Value Set version.
lang	Optional	The language locale of the Value Set. If present, it shall be encoded as a string from the set of languages listed in IETF RFC5646 (identical to the values of xml:lang, described in the SOAP binding). If present, the Accept-Language field of the HTTP Header may also contain the same value (see Section 14.4 of IETF RFC2616).

The full URL for the HTTP binding looks as follows:

```
https://example.com/RetrieveValueSet?id=1.2.840.10008.6.1.3
08&version=20061023&lang=en-US
```

7135   Note: "en-US" will not match "en". For applications that need a more sophisticated user sensitive language matching capability, omitting the lang parameter will return all languages so that the application can make a determination of which language best fits the current user.

3.48.5.2.2 HTTP Response

Value Set Repositories shall format the response to the HTTP GET operation as an HTTP
7140 response message as defined in IETF RFC2616.

The Content-Type field of the HTTP header shall be "text/xml" (see Section 14.4 of IETF RFC2616).

The content of the HTTP response message shall be an XML encoded Expanded Value Set that complies with the SVS schema. The XML format shall be identical to the body of the SOAP
7145 response described in the SOAP binding. The Expanded Value Set shall correspond to the Values Set identified by the Value Set Unique ID in the *id* parameter, the Value Set Version in the *version* parameter, and the language in the *lang* parameter.

An informative WSDL file containing both SOAP and HTTP bindings for the Value Set Repository can be found on the IHE ftp site (see ITI TF-2x: Appendix W).

7150 ### 3.48.5.3 Sample SOAP Messages

The samples in the following two sections show a typical SOAP request and its corresponding SOAP response. The sample messages also show the WS-Addressing headers <Action/>, <MessageID/>, <ReplyTo/>…; these WS-Addressing headers are populated according to the W3C WS-Addressing standard.

7155 All of the samples presented in this section are also available online on the IHE FTP site (see ITI TF-2x: Appendix W).

3.48.5.3.1 Sample Retrieve Value Set SOAP Request

```
7160    <?xml version="1.0" encoding="UTF-8"?>
        <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
            xmlns:a="http://www.w3.org/2005/08/addressing">
            <s:Header>
                <a:Action s:mustUnderstand="1">urn:ihe:iti:2008:RetrieveValueSet</a:Action>
                <a:MessageID>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:MessageID>
7165            <a:ReplyTo>
                    <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
                </a:ReplyTo>
                <a:To s:mustUnderstand="1">http://valuesetrepository/</a:To>
            </s:Header>
7170        <s:Body>
                <RetrieveValueSetRequest xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                     xmlns="urn:ihe:iti:svs:2008">
                    <ValueSet id="1.2.840.10008.6.1.308" xml:lang="en-EN"/>
                </RetrieveValueSetRequest>
7175        </s:Body>
        </s:Envelope>
```

3.48.5.3.2 Sample Retrieve Value Set SOAP Response

```
        <?xml version="1.0" encoding="UTF-8"?>
7180    <s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing"
         xmlns:s="http://www.w3.org/2003/05/soap-envelope">
            <s:Header>
                <a:Action
        s:mustUnderstand="1">urn:ihe:iti:2008:RetrieveValueSetResponse</a:Action>
7185            <a:RelatesTo>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:RelatesTo>
            </s:Header>
            <s:Body>
                <RetrieveValueSetResponse xmlns:xsi="http://www.w3.org/2001/XMLSchema-
        instance"
7190                xmlns="urn:ihe:iti:svs:2008" cacheExpirationHint="2008-08-15T00:00:00-
        05:00">
                    <ValueSet id="1.2.840.10008.6.1.308"
                        displayName="Common Anatomic Regions Context ID 4031"
        version="20061023">
7195                <ConceptList xml:lang="en-US">
                        <Concept code="T-D4000" displayName="Abdomen"
        codeSystem="2.16.840.1.113883.6.5"/>
                        <Concept code="R-FAB57" displayName="Abdomen and Pelvis"
        codeSystem="2.16.840.1.113883.6.5"/>
7200                    <Concept code="T-15420" displayName="Acromioclavicular joint"
        codeSystem="2.16.840.1.113883.6.5"/>
                        <Concept code="T-15750" displayName="Ankle joint "
        codeSystem="2.16.840.1.113883.6.5"/>
                        <Concept code="T-280A0" displayName="Apex of Lung"
7205    codeSystem="2.16.840.1.113883.6.5"/>
                        <Concept code="T-D8200" displayName="Arm"
        codeSystem="2.16.840.1.113883.6.5"/>
                        <Concept code="T-60610" displayName="Bile Duct"
        codeSystem="2.16.840.1.113883.6.5"/>
7210                    <Concept code="T-74000" displayName="Bladder"
        codeSystem="2.16.840.1.113883.6.5"/>
                        <Concept code="T-04000" displayName="Breast"
        codeSystem="2.16.840.1.113883.6.5"/>
                        <Concept code="T-26000" displayName="Bronchus"
7215    codeSystem="2.16.840.1.113883.6.5"/>
```

```
                    <Concept code="T-12770" displayName="Calcaneus"
codeSystem="2.16.840.1.113883.6.5"/>
                    <Concept code="T-11501" displayName="Cervical spine"
codeSystem="2.16.840.1.113883.6.5"/>
7220                </ConceptList>
            </ValueSet>
        </RetrieveValueSetResponse>
    </s:Body>
</s:Envelope>
```

7225 ## 3.48.6 Security Requirements

For security considerations please consult ITI TF-1: 21.4.

Audit trails shall be configurable to record access to a selected list of Value Sets.

3.48.6.1 Audit Record Considerations

The Retrieve Value Set transaction is an Import/Export event as defined in ITI TF-2a: Table
7230 3.20.4.1.1.1-1 with the following exceptions.

3.48.6.1.1 Value Set Consumer audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create) or "U" (Update)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-48", "IHE Transactions", "Retrieve Value Sets") or EV("ITI-60","IHE Transactions","Retrieve Multiple Value Sets")
Source (Value Set Repository) (1)			
Human Requestor (0..n)			
Destination (Value Set Consumer) (1)			
Audit Source (Value Set Consumer) (1)			
ValueSetInstance (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	Repository HTTP or SOAP endpoint URI
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"false"
	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.

7235

Destination AuditMessage/ ActiveParticipant	*UserID*	*U*	*not specialized.*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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.

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	M	"false"
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	*U*	*not specialized*
	NetworkAccessPointID	*U*	*not specialized*

Audit Source AuditMessage/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Value Set Instance (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"3" (Report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	*M*	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of <Value Set Unique ID>
	ParticipantObjectName	O	The value of <Value Set name>
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	O	The value of <Value Set Version>

7240 **3.48.6.1.2 Value Set Repository audit message:**

	Field Name	**Opt**	**Value Constraints**
Event AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-48", "IHE Transactions", "Retrieve Value Sets") or EV("ITI-60","IHE Transactions","Retrieve Multiple Value Sets")
Source (Value Set Repository) (1)			
Human Requestor (0..n)			
Destination (Value Set Consumer) (1)			
Audit Source (Value Set Source) (1)			

ValueSetInstance (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	the process ID as used within the local operating system in the local system logs.
	AlternativeUserID	U	Repository HTTP or SOAP endpoint URI
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"false"
	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*	*U*	*not specialized*
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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.

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

Audit Source AuditMessage/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

7245

Value Set Instance (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"3" (Report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	*M*	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of <Value Set Unique ID>
	ParticipantObjectName	O	The value of <Value Set name>
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	The value of <Value Set Version>

3.49 Convey Printed Referral Request [ITI-49]

This transaction has been retired in favor of use of the Cross-Enterprise Document Workflow (XDW) Profile.

7250 ## 3.50 Request Referral [ITI-50]

This transaction has been retired in favor of use of the Cross-Enterprise Document Workflow (XDW) Profile.

3.51 Multi-Patient Stored Query [ITI-51]

This section corresponds to transaction ITI-51 of the IHE Technical Framework. Transaction
7255 ITI-51 is used by the Document Consumer and Document Registry Actors.

3.51.1 Scope

The Multi-Patient Stored Query supports a variety of queries for multiple patients. It is based on the Registry Stored Query [ITI-18] transaction. The main difference is the set of queries, which is specified in this transaction.

7260 ### 3.51.2 Use Case Roles
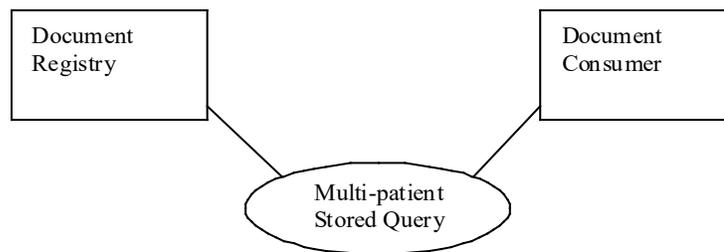
Actor: Document Consumer

Role: Issues a Multi-Patient Stored Query to retrieve metadata based on criteria common to multiple patients

7265 **Actor:** Document Registry

Role: Responds to a Multi-Patient Stored Query by providing the metadata or object references of registry objects which satisfy the query parameters

3.51.3 Referenced Standard

Implementers of this transaction shall comply with all requirements described in ITI TF-2x:
7270 Appendix V Web Services for IHE Transactions.

ebRIM   OASIS ebXML Registry Information Model v3.0

ebRS   OASIS ebXML Registry Services Specifications v3.0

ITI TF-2a: 3.18 Registry Stored Query [ITI-18]

ITI TF-3: 4   Metadata used in Document Sharing profiles

7275 ## 3.51.4 Interaction Diagram
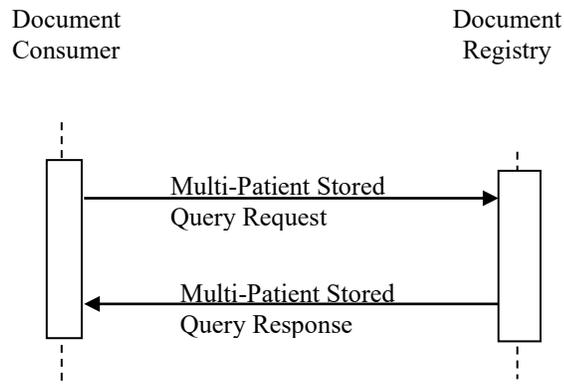
3.51.4.1 Multi-Patient Stored Query Request

This is a query request from the Document Consumer to the Document Registry. The query request contains:

7280 - A reference to a pre-defined query stored on the Document Registry Actor

- Parameters to the query

3.51.4.1.1 Trigger Events

The message is initiated when a Document Consumer wants to query for metadata based on criteria spanning multiple patients (multiple Patient IDs).

7285 ### 3.51.4.1.2 Message Semantics

The message semantics are identical to those documented for the Registry Stored Query [ITI-18] transaction except where noted below. The following sections document the differences.

Document Consumer and Document Registry Actors that support the Asynchronous Web Services Exchange Option shall support Asynchronous Web Services requirements as defined in
7290 ITI TF-2x: V.5.

3.51.4.1.2.1 Query Definitions

This transaction defines the following Stored Queries that may query for multiple Patient Ids.

3.51.4.1.2.1.1 FindDocumentsForMultiplePatients

This Multi-Patient Query is semantically identical to the FindDocuments Stored Query (see ITI
7295 TF-2a: 3.18.4.1.2.3.7.1) except:

- $XDSDocumentEntryPatientId is optional (may have zero values).

- $XDSDocumentEntryPatientId may contain multiple values.

- At least one of the ClassCode, EventCodeList, or HealthcareFacilityTypeCode shall be specified in the provided set of parameters.

7300   **Returns:** XDSDocumentEntry or ObjectRef objects matching the query parameters

Parameter Name	Attribute	Opt	Mult
$XDSDocumentEntryPatientId	XDSDocumentEntry.patientId	O	M
$XDSDocumentEntryClassCode[1,2]	XDSDocumentEntry.classCode	O	M
$XDSDocumentEntryTypeCode[1]	XDSDocumentEntry.typeCode	O	M
$XDSDocumentEntryPracticeSettingCode[1]	XDSDocumentEntry.practiceSettingCode	O	M
$XDSDocumentEntryCreationTimeFrom	Lower value of XDSDocumentEntry.creationTime	O	--
$XDSDocumentEntryCreationTimeTo	Upper value of XDSDocumentEntry.creationTime	O	--
$XDSDocumentEntryServiceStartTimeFrom	Lower value of XDSDocumentEntry.serviceStartTime	O	--
$XDSDocumentEntryServiceStartTimeTo	Upper value of XDSDocumentEntry.serviceStartTime	O	--
$XDSDocumentEntryServiceStopTimeFrom	Lower value of XDSDocumentEntry.serviceStopTime	O	--
$XDSDocumentEntryServiceStopTimeTo	Upper value of XDSDocumentEntry.serviceStopTime	O	--
$XDSDocumentEntryHealthcareFacilityTypeCode[1,2]	XDSDocumentEntry.healthcareFacilityTypeCode	O	M
$XDSDocumentEntryEventCodeList[1,2]	XDSDocumentEntry.eventCodeList[3]	O	M
$XDSDocumentEntryConfidentialityCode[1]	XDSDocumentEntry.confidentialityCode[3]	O	M
$XDSDocumentEntryAuthorPerson[4]	XDSDocumentEntry.author	O	M
$XDSDocumentEntryFormatCode[1]	XDSDocumentEntry.formatCode	O	M
$XDSDocumentEntryStatus	XDSDocumentEntry.status	R	M
$XDSDocumentEntryType[5]	XDSDocumentEntry.objectType	O	M

[1]Shall be coded according to specification in ITI TF-2a: 3.18.4.1.2.3.4 Coding of Code/Code-Scheme.

[2]At least one of $XDSDocumentEntryClassCode, $XDSDocumentEntryEventCodeList, or
7305 $XDSDocumentEntryHealthcareFacilityTypeCode shall be specified.

[3]Supports AND/OR semantics as specified in ITI TF-2a: 3.18.4.1.2.3.5.

[4]The value for this parameter is a pattern compatible with the SQL keyword LIKE which allows the use of the following wildcard characters: % to match any (or no) characters and _ to match a single character. The match shall be applied to the text contained in the Value elements of the authorPerson Slot on the author Classification (value strings of the authorPerson sub-attribute)

7310

[5] See ITI TF-2a: 3.18.4.1.2.3.6.2

3.51.4.1.2.1.2 FindFoldersForMultiplePatients

This Multi-Patient Query is semantically identical to the FindFolders Stored Query (see ITI TF-2a: 3.18.4.1.2.3.7.3) except:

7315

1. $XDSFolderPatientId is optional (may have zero values).

2. $XDSFolderPatientId may contain multiple values.

3. $XDSFolderCodeList shall be a required parameter.

Returns: XDSFolder or ObjectRef objects matching the query parameters

Parameter Name	Attribute	Opt	Mult
$XDSFolderPatientId	XDSFolder.patientId	O	M
$XDSFolderLastUpdateTimeFrom	XDSFolder.lastUpdateTime lower value	O	--
$XDSFolderLastUpdateTimeTo	XDSFolder.lastUpdateTime upper bound	O	--
$XDSFolderCodeList[1,3]	XDSFolder.codeList	R	M
$XDSFolderStatus	XDSFolder.status	R	M

7320 [1]Shall be coded according to specification in ITI TF-2a: 3.18.4.1.2.3.4 Coding of Code/Code-Scheme.

[3]Supports AND/OR semantics as specified in ITI TF-2a: 3.18.4.1.2.3.5.

3.51.4.1.2.2 Multi-Patient Stored Query IDs

The following Query Ids shall be used to represent these queries.

7325

Query Name	Query ID
FindDocumentsForMultiplePatients	`urn:uuid:3d1bdb10-39a2-11de-89c2-2f44d94eaa9f`
FindFoldersForMultiplePatients	`urn:uuid:50d3f5ac-39a2-11de-a1ca-b366239e58df`

3.51.4.1.2.3 Web Services Transport

The query request and response shall be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V. The specific values for the WSDL describing the Multi-Patient Stored Query Service are described in this section.

7330 The Document Registry shall accept a Multi-Patient Stored Query Request formatted as a SIMPLE SOAP message and respond with a Multi-Patient Stored Query Response formatted as a SIMPLE SOAP message. The Document Consumer shall generate the Multi-Patient Stored Query Request formatted as a SIMPLE SOAP message and accept a Multi-Patient Stored Query Response formatted as a SIMPLE SOAP message.

7335 **IHE-WSP201) The attribute /wsdl:definitions/@name shall be "DocumentRegistry".**

The following WSDL naming conventions shall apply:

```
wsdl:definitions/@name="DocumentRegistry":
query message     -> "MultiPatientStoredQuery_Message"
query response    -> "MultiPatientStoredQueryResponse_Message"
portType          -> "DocumentRegistry_PortType"
operation         -> "DocumentRegistry_MultiPatientStoredQuery"
SOAP 1.2 binding  -> "DocumentRegistry_Binding_Soap12"
SOAP 1.2 port     -> "DocumentRegistry_Port_Soap12"
```

7340

IHE-WSP202) The targetNamespace of the WSDL shall be "urn:ihe:iti:xds-b:2007"

7345 These are the requirements for the Multi-Patient Stored Query transaction presented in the order in which they would appear in the WSDL definition:

1. The following types shall be imported (xsd:import) in the /definitions/types section:

   - namespace=" urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0", schemaLocation="query.xsd"

7350 2. The /definitions/message/part/@element attribute of the Multi-Patient Stored Query Request message shall be defined as "query:AdhocQueryRequest"

3. The /definitions/message/part/@element attribute of the Multi-Patient Stored Query Response message shall be defined as "query:AdhocQueryResponse"

4. The /definitions/portType/operation/input/@wsaw:Action attribute for the Multi-Patient
7355 Stored Query Request message shall be defined as "urn:ihe:iti:2009:MultiPatientStoredQuery"

5. The /definitions/portType/operation/output/@wsaw:Action attribute for the Multi-Patient Stored Query Response message shall be defined as "urn:ihe:iti:2009:MultiPatientStoredQueryResponse"

7360 6. The /definitions/binding/operation/soap12:operation/@soapActionRequired attribute shall be defined as "false"

The following WSDL fragment shows an example of Multi-Patient Stored Query transaction definition:

7365
```xml
<?xml version="1.0" encoding="utf-8"?>
<definitions ...>
  ...
  <types>
    <xsd:schema elementFormDefault="qualified" targetNamespace="urn:ihe:iti:xds-b:2007">
      <xsd:import
        namespace="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
        schemaLocation="schema\query.xsd"/>
```
7370

```
            ...
          </xsd:schema>
7375    </types>
        <message name="RegistryStoredQuery_Message">
          <documentation>Multi-Patient Stored Query</documentation>
          <part name="body" element="query:AdhocQueryRequest"/>
        </message>
7380    <message name="RegistryStoredQueryResponse_Message">
          <documentation>Multi-Patient Stored Query Response</documentation>
          <part name="body" element="query:AdhocQueryResponse"/>
        </message>
        ...
7385    <portType name="MPQRegistry_PortType">
          <operation name="MultiPatientStoredQuery">
            <input message="ihe:RegistryStoredQuery_Message"
                wsaw:Action="urn:ihe:iti:2009:MultiPatientStoredQuery"/>
            <output message="ihe:RegistryStoredQueryResponse_Message"
7390            wsaw:Action="urn:ihe:iti:2009:MultiPatientStoredQueryResponse"/>
          </operation>
          ...
        </portType>
        ...
7395    </definitions>
```

A full WSDL for the Document Consumer and Document Registry Actors is found in ITI TF-2x:
Appendix W.

3.51.4.1.2.4 Sample SOAP Messages

7400 The samples in the following two sections show a typical SOAP request and its relative SOAP
response. The sample messages also show the WS-Addressing headers <a:Action/>,
<a:MessageID/>, <a:ReplyTo/>…; these WS-Addressing headers are populated according to ITI
TF-2x: Appendix V: Web Services for IHE Transactions. The body of the SOAP message is
omitted for brevity; in a real scenario the empty element will be populated with the appropriate
metadata.

7405 Samples presented in this section are also available online on the IHE FTP site, see ITI TF-2x:
Appendix W.

3.51.4.1.2.4.1 Sample Multi-Patient Stored Query SOAP Request

```
        <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
        xmlns:a="http://www.w3.org/2005/08/addressing">
7410        <s:Header>
                <a:Action s:mustUnderstand="1">urn:ihe:iti:2009:MultiPatientStoredQuery</a:Action>
                <a:MessageID>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:MessageID>
                <a:ReplyTo s:mustUnderstand="1">>
                    <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
7415        </a:ReplyTo>
                <a:To>http://localhost/service/IHEMPQRegistry.svc</a:To>
            </s:Header>
            <s:Body>
                <query:AdhocQueryRequest
7420                xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
                    xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
                    xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
                    <query:ResponseOption returnComposedObjects="true" returnType="LeafClass"/>

7425            <!-- FindDocumentsForMultiplePatients -->
                <rim:AdhocQuery id="urn:uuid:3d1bdb10-39a2-11de-89c2-2f44d94eaa9f">
                    <rim:Slot name="$XDSDocumentEntryStatus">
                        <rim:ValueList>
```

```
7430                    <rim:Value>('urn:oasis:names:tc:ebxml-
         regrep:ResponseStatusType:Approved')</rim:Value>
                     </rim:ValueList>
                 </rim:Slot>


7435
                 <!-- Note the lack of a specification of the $XDSDocumentEntryPatientId parameter
         -->


7440
             </rim:AdhocQuery>
         </query:AdhocQueryRequest>
     </s:Body>
 </s:Envelope>
7445
```

3.51.4.1.2.4.2 Sample Multi-Patient Stored Query SOAP Response

```
 <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
 xmlns:a="http://www.w3.org/2005/08/addressing">
     <s:Header>
7450     <a:Action
 s:mustUnderstand="1">urn:ihe:iti:2009:MultiPatientStoredQueryResponse</a:Action>
         <a:RelatesTo>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:RelatesTo>
     </s:Header>
     <s:Body>
7455     <query:AdhocQueryResponse
             xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
             status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success">
             <rim:RegistryObjectList xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">

7460             <!-- Internal details of ExtrinsicObjects are not shown -->

                 <rim:ExtrinsicObject/>
                 <rim:ExtrinsicObject/>
                 <rim:ExtrinsicObject/>
7465             <rim:ExtrinsicObject/>
                 <rim:ExtrinsicObject/>
                 <rim:ExtrinsicObject/>
             </rim:RegistryObjectList>
         </query:AdhocQueryResponse>
7470     </s:Body>
 </s:Envelope>
```

3.51.4.1.3 Expected Actions

See Registry Stored Query [ITI-18] for Expected Actions – ITI TF-2a: 3.18.4.1.3.

3.51.5 Security Considerations

7475   All of the Security Considerations found in [ITI-18] apply with the following further profiling.

It is expected that the ATNA authentication would be used to restrict access to the Multi-Patient Query [ITI-51] transaction. It is expected that few systems would be allowed to request the LeafClass return result.

3.51.5.1 Security Audit Considerations

7480   The actors involved shall record one audit event for each patient identity that has been included in the query according to the following. It is important for security auditing that the audit

message contain only one patient identity to better handle these messages in the Audit Record Repository. If the query includes no patient identities, both Actors shall record a single audit event with no Patient participant.

3.51.5.1.1 Document Consumer audit message:

7485

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	U	*not specialized*
	EventOutcomeIndicator	U	*not specialized*
	EventTypeCode	M	EV("ITI-51","IHE Transactions","Multi-Patient Stored Query")
Source (Document Consumer) (1)			
Human Requestor (0..n)			
Destination (Document Registry) (1)			
Audit Source (Document Consumer) (1)			
Patient (0..n)			
Query Parameters (1)			

Where:

	UserID	C	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
Source **AuditMessage/** **ActiveParticipant**	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	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.

	UserID	M	Identity of the human that initiated the transaction.
Human **Requestor** **(if known)** **AuditMessage/** **ActiveParticipant**	*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*

	UserID	M	SOAP endpoint URI.
Destination **AuditMessage/** **ActiveParticipant**	*AlternativeUserID*	U	*not specialized*
	UserName	U	*not specialized*
	UserIsRequestor	U	*not specialized*
	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. |

7490

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

Patient (if known) **(AuditMessage/** **ParticipantObjectIde** **ntification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	*U*	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

Query Parameters **(AuditMessage/** **ParticipantObjectIde** **ntification)**	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-51", "IHE Transactions", "Multi-Patient Stored Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	Stored Query ID (UUID)
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the AdhocQueryRequest, base64 encoded.3

	ParticipantObjectDetail	M	The ParticipantObjectDetail element shall occur at least once.
			 The first element shall contain:
			     Type: "QueryEncoding" (literal string)
			     Value: the character encoding, such as "UTF-8", used to encode the ParticipantObjectQuery before base64 encoding
			 If the homeCommunityId is known, the second element shall contain:
			     Type: "urn:ihe:iti:xca:2010:homeCommunityId" (literal string)
			     Value: value of the homeCommunityId

3.51.5.1.2 Document Registry audit message:

	Field Name	**Opt**	**Value Constraints**
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	*U*	*not specialized*
	EventOutcomeIndicator	*U*	*not specialized*
	EventTypeCode	M	EV("ITI-51", "IHE Transactions", "Multi-Patient Stored Query")
Source (Document Consumer) (1)			
Destination (Document Registry) (1)			

Audit Source (Document Registry) (1)
Patient (0..n)
Query Parameters (1)

7495 Where:

Source AuditMessage/ ActiveParticipant	UserID	C	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	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	SOAP endpoint URI.
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	U	*not specialized*
	UserIsRequestor	U	*not specialized*
	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/ AuditSourceIdentificati on	*AuditSourceID*	U	*not specialized*
	AuditEnterpriseSiteID	U	*not specialized*
	AuditSourceTypeCode	U	*not specialized*

Patient (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	U	*not specialized*
	ParticipantObjectIDTypeCode	U	*not specialized*
	ParticipantObjectSensitivity	U	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	U	*not specialized*

7500

Query Parameters (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-51", "IHE Transactions", "Multi-Patient Stored Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	Stored Query ID (UUID)
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the AdhocQueryRequest, base64 encoded.
	ParticipantObjectDetail	*M*	The ParticipantObjectDetail element shall occur at least once. The first element shall contain: Type: "QueryEncoding" (literal string) Value: the character encoding, such as "UTF-8", used to encode the ParticipantObjectQuery before base64 encoding If the homeCommunityId is known, the second element shall contain: Type: "urn:ihe:iti:xca:2010:homeCommunityId" (literal string) Value: value of the homeCommunityId

3.52 Document Metadata Subscribe [ITI-52]

This section corresponds to Transaction ITI-52 of the IHE IT Infrastructure Technical
7505 Framework. Transaction ITI-52 is used by the Document Metadata Subscriber and the Document
Metadata Notification Broker Actors.

3.52.1 Scope

This transaction involves a request by the Document Metadata Subscriber to the Document
Metadata Notification Broker to start a subscription using a particular set of filters, or to cancel
7510 an existing subscription.

3.52.2 Use Case Roles
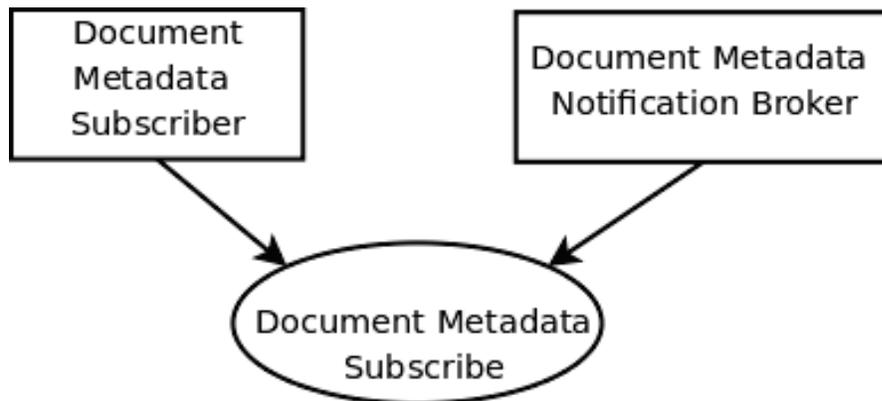
Actor: Document Metadata Subscriber

7515   **Role:** Sends, on the behalf of Document Metadata Notification Recipients, subscription requests, or subscription cancellation messages to the Document Metadata Notification Broker

Actor: Document Metadata Notification Broker

Role: Manages subscriptions of Document Metadata Notification Recipients

3.52.3 Referenced Standards

7520   • OASIS Web Services Notification Family of Standards

• WS-BaseNotification 1.3 OASIS Standard

• WS-BrokeredNotification 1.3 OASIS Standard

• WS-Topics 1.3 OASIS Standard

• ITI TF-2a: 3.18 - Registry Stored Query Transaction

7525   • ITI TF-2x: Appendix V

3.52.4 Interaction Diagram
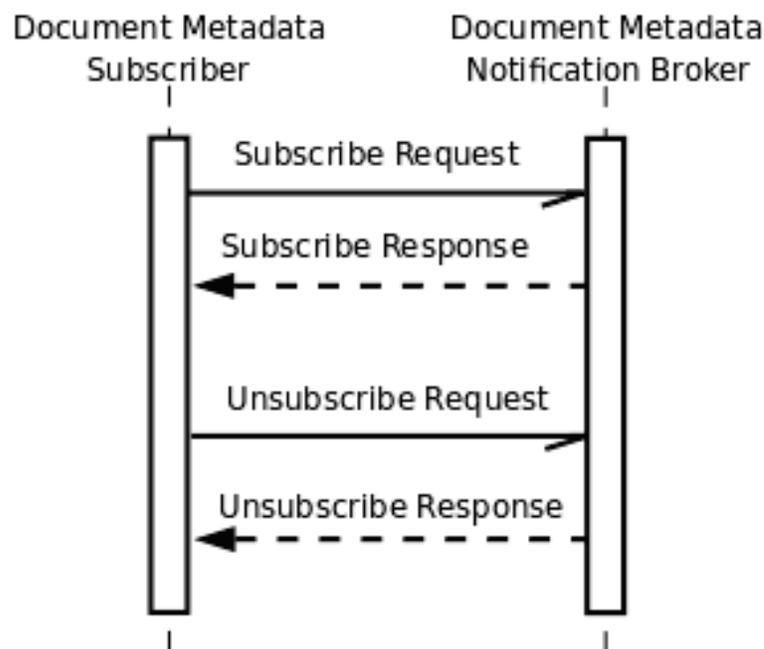
Figure 3.52.4-1: Document Metadata Subscribe Sequence

7530 **3.52.4.1 Subscribe Request Message**

3.52.4.1.1 Trigger

A Document Metadata Notification Recipient's need to initiate a subscription will cause the Document Metadata Subscriber to trigger a Subscribe Request message.

3.52.4.1.2 Message Semantics

7535 The Subscribe Request message shall comply with the requirements in the WS-BaseNotification standard. Note that the value of the WS-Addressing Action element is prescribed in the standard, and differs from the requirements of Appendix V. The *wsnt:ConsumerReference* element describes the Web Service endpoint where notifications must be sent. The *wsnt:Filter* element shall contain the topics and values for these topics for which a notification shall be sent.

7540 Implementers of the pattern shall specify the topic content to be put within the *wsnt:Filter* element. The wsnt:Filter element shall contain a *TopicExpression* element.

This transaction uses simple topics in accordance with the WS-Topics standard and as specified in Section 3.52.5.

This transaction uses a filter based on the Registry Stored Query [ITI-18] transaction syntax and 7545 semantics as specified in Section 3.52.5 Subscription Topics and Filter Expressions.

3.52.4.1.3 Expected Actions

The Notification Broker shall be capable of maintaining multiple concurrent Subscriptions.

The Notification Broker shall keep track of each unique subscription and will provide a unique subscription reference which shall be used by the Subscriber to send subsequent cancellations

7550 The Subscriber may indicate the duration of the subscription using the *wsnt:InitialTerminationTime* element, where a time stamp (expressed as an XML Schema *dateTime* data type value) or a duration (expressed as an XML Schema *duration* data type value) can be used.

If the Document Metadata Notification Broker is not able to understand a filter expression it 7555 SHALL create faults in accordance with the following rules:

- InvalidFilterFault: the Subscribe message contained a filter that was not understood or supported by the Document Metadata Notification Broker. For example the ReferenceIdList filter parameter exists and the Document Metadata Notification Broker cannot satisfy it.

7560 - TopicExpressionDialectUnknownFault: the Subscribe message contained a TopicExpression filter having a dialect that was not understood or supported by the Document Metadata Notification Broker.

- InvalidTopicExpressionFault: the Subscribe message contained a TopicExpression filter where the contents of the filter did not match the dialect specified.

___

7565 - TopicNotSupportedFault: the Subscribe message contained a TopicExpression filter that referenced a topic that was not supported by the Document Metadata Notification Broker. This Fault SHALL be generated by a Document Metadata Notification Broker that does not support the Folder Subscription Option if it receives a request for a subscription using the topic ihe:FolderMetadata.

7570 - SubscribeCreationFailedFault: The Document Metadata Notification Broker failed to process the Subscribe message. The Document Metadata Notification Broker SHOULD use a more specific fault message if possible. The Document Metadata Notification Broker MAY include a hint in the fault message indicating why it failed to process the Subscribe message.

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3.52.4.1.4 Example Subscribe Request Message (subscription on a document filter)

```
7580
7585
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7600
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7615
7620
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://www.w3.org/2005/08/addressing"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
    xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
    xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
    <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeRequest</a:Action>
        <a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
        <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
    </s:Header>
    <s:Body>
        <wsnt:Subscribe>
            <!-- The Recipient on whose behalf the subscription is requested - the address where
the notification is to be sent -->
            <wsnt:ConsumerReference>
                <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
            </wsnt:ConsumerReference>
            <wsnt:Filter>
                <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:TopicExpression>
                <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
                    <rim:Slot name="$XDSDocumentEntryPatientId">
                        <rim:ValueList>
<rim:Value>'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rim:Value>
                        </rim:ValueList>
                    </rim:Slot>
                    <rim:Slot name="$XDSDocumentEntryHealthcareFacilityTypeCode">
                        <rim:ValueList>
                            <rim:Value>('Emergency
Department^^healthcareFacilityCodingScheme')</rim:Value>
                        </rim:ValueList>
                    </rim:Slot>
                </rim:AdhocQuery>
            </wsnt:Filter>
            <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
        </wsnt:Subscribe>
    </s:Body>
```

```
</s:Envelope>
```

3.52.4.2 Subscribe Response Message

3.52.4.2.1 Trigger

7625 This message is an immediate response to a Subscribe Request, and it is sent from the Document Metadata Notification Broker to the Document Metadata Subscriber.

3.52.4.2.2 Message Semantics

The Subscribe Response message shall comply with the requirements in the WS-BaseNotification standard, including the use of the appropriate SOAP Fault messages. Note that
7630 the value of the WS-Addressing Action element is prescribed in the standard, and differs from the requirements of ITI TF-2x: Appendix V.

The subscription identifier is assigned by the Notification Broker as a subscription reference, communicated in the response in the SOAP body in wsnt:SubscribeResponse/wsnt:SubscriptionReference (a WS-Addressing endpoint). The
7635 subscription reference shall consist of:

- an *Address* element, containing a webservices endpoint

In order to unsubscribe, the request shall be sent to the endpoint specified in the Address component of the SubscriptionReference.

3.52.4.2.3 Expected Actions

7640 If the Document Metadata Subscriber had indicated a requested duration for the subscription, the Document Metadata Notification Broker shall send the assigned duration for the subscription using the *wsnt:TerminationTime* element.

If the Document Metadata Subscriber had not indicated a requested duration for the subscription, the Document Metadata Notification Broker may send an assigned duration for the subscription
7645 (if any), using the *wsnt:TerminationTime* element.

If the Document Metadata Notification Broker sends an assigned duration for the subscription, the Subscriber shall associate the assigned duration with the accepted subscription request.

The Document Metadata Subscriber shall associate the accepted subscription request with the subscription reference address assigned by the Document Metadata Notification Broker in order
7650 to be able to send cancellations for existing subscriptions.

3.52.4.2.4 Example

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://www.w3.org/2005/08/addressing"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
    xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd">
```
7655

```
7660        <s:Header>
            <a:Action>http://docs.oasis-open.org/wsn/bw-
        2/NotificationProducer/SubscribeResponse</a:Action>
        </s:Header>
        <s:Body>
7665        <wsnt:SubscribeResponse>
                <!-- A WS-Addressing endpoint, where modification and cancelation requests for this
        subscription must be sent -->
                <wsnt:SubscriptionReference>
                    <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
7670        8443</a:Address>
                </wsnt:SubscriptionReference>
                <wsnt:TerminationTime>2008-05-31T00:00:00Z</wsnt:TerminationTime>
            </wsnt:SubscribeResponse>
        </s:Body>
7675    </s:Envelope>
```

3.52.4.3 Unsubscribe Request Message

3.52.4.3.1 Trigger

When a subscription is no longer needed, a Document Metadata Subscriber will trigger an
Unsubscribe Request message.

7680 ### 3.52.4.3.2 Message Semantics

The Unsubscribe Request message shall comply with the requirements in the WS-
BaseNotification standard. The message conveys the request to cancel an existing subscription.
Note that the value of the WS-Addressing Action element is prescribed in the standard, and
differs from the requirements of ITI TF-2x: Appendix V.

7685 ### 3.52.4.3.3 Expected Actions

The Document Metadata Subscriber shall send this message to the endpoint associated with the
existing subscription.

The Document Metadata Notification Broker shall cancel the corresponding subscription, and
respond with an Unsubscribe Response message. In the case when, for whatever reason, the
7690 subscription cannot be canceled, the Document Metadata Notification Broker shall respond with
a ResourceUnknownFault or an UnableToDestroySubscriptionFault SOAP Fault message as
appropriate.

3.52.4.3.4 Example

```
7695    <?xml version="1.0" encoding="UTF-8"?>
        <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
            xmlns:a="http://www.w3.org/2005/08/addressing"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
7700        xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
        envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
        http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd">
            <s:Header>
                <a:Action>http://docs.oasis-open.org/wsn/bw-
        2/SubscriptionManager/UnsubscribeRequest</a:Action>
7705            <a:MessageID>382dcdc9-8e86-9fde-8445-48fd83bca93a</a:MessageID>
                <a:To>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-8443</a:To>
            </s:Header>
```

```
        <s:Body>
            <wsnt:Unsubscribe/>
        </s:Body>
    </s:Envelope>
```
7710

3.52.4.4 Unsubscribe Response Message

3.52.4.4.1 Trigger

This message is an immediate response to an Unsubscribe Request message, and it is sent from
7715 the Document Metadata Notification Broker to the Document Metadata Subscriber.

3.52.4.4.2 Message Semantics

The Unsubscribe Response message shall comply with the requirements in the WS-
BaseNotification standard. This message indicates that an Unsubscribe message was successfully
processed. Note that the value of the WS-Addressing Action element is prescribed in the
7720 standard, and differs from the requirements of ITI TF-2x: Appendix V.

3.52.4.4.3 Expected Actions

The Document Metadata Notification Broker shall cancel the corresponding subscription.

The Document Metadata Subscriber shall mark the corresponding subscription as successfully
terminated.

7725 ### 3.52.4.4.4 Example

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://www.w3.org/2005/08/addressing"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
7730    xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
    xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd">
    <s:Header>
7735        <a:Action>http://docs.oasis-open.org/wsn/bw-
2/SubscriptionManager/UnsubscribeResponse</a:Action>
    </s:Header>
    <s:Body>
        <wsnt:UnsubscribeResponse/>
7740    </s:Body>
</s:Envelope>
```

3.52.5 Subscription Topics and Filter Expressions

This transaction restricts the subscription topic to be one of FullDocumentEntry or
MinimalDocumentEntry (Section 3.52.5.1) and restricts the semantics of filter expressions to the
7745 semantics of a subset (Section 3.52.5.2) of the Registry Stored Query [ITI-18] transaction.

3.52.5.1 Topics

This transaction defines simple topics as described in the WS-Topics specification. If the
Document Metadata Notification Broker supports the Folder Subscription Option it shall support

---

7750 all the following topics in a Document Metadata Subscribe Request; otherwise it shall reject subscription Request which specify folder's topic generating a fault (see Section 3.52.4.1.3 "Expected Actions"). The Document Metadata Subscriber may support a subset of these topics:

3.52.5.1.1 ihe:FullDocumentEntry

This topic indicates that the events for which the subscription is made shall be Document Entry registrations, and that the notification shall contain the full metadata describing each matching

7755 Document Entry as described in the Notification transaction in Section 3.53.4.1.2.

3.52.5.1.2 ihe:MinimalDocumentEntry

This topic indicates that the events for which the subscription is made shall be Document Entry registrations, and that the notification shall contain the minimal set of data describing each matching Document Entry as described in the Document Metadata Notify transaction in Section

7760 3.53.4.1.2.

3.52.5.1.3 ihe:SubmissionSetMetadata

This topic indicates that the event for which the subscription is made shall be creating a SubmissionSet and that the notification shall contain the full metadata describing the match with the SubmissionSet object, as described in the Document Metadata Notify transaction in Section

7765 3.53.4.1.2.

3.52.5.2 Building Filter Expressions

The XDS metadata, specified in ITI TF-3: 4.1, describes the objects which are used in a document registration. The Registry Stored Query [ITI-18] transaction uses a subset of the metadata to build a list of queries available to a XDS Document Consumer to search for

7770 documents with specific characteristics. The list of queries is in ITI TF-2a: 3.18.4.1.2.3.7. The transaction Document Metadata Subscribe uses the syntax of the Registry Stored Query [ITI-18] transaction for the creation of the filtering expression.

Filters can be created using the parameters of the FindDocuments, FindDocumentsByReferenceId, FindSubmissionSet queries defined within the Registry Stored

7775 Query transaction and use the syntax of the FindDocuments FindDocumentsByReferenceId or FindSubmissionSets queries to express the filter.

The evaluation of filter expressions is based on the XDS metadata model. In this transaction, the stream of events for which subscriptions are possible is limited to events representing the existence of SubmissionSet and documentEntry Objects. The Document Metadata Notification

7780 Broker becomes aware of such events either via a Document Metadata Publish [ITI-54] transaction, or via other mechanisms not specified by IHE. The Document Metadata Notification Broker shall determine if there is a subscription which matches any of the Document Entry Objects or SubmissionSet Object in an event.

A match means that if a Registry Stored Query, with the same parameters as the filter expression

7785 in the subscription, were sent to a XDS Document Registry containing the Document Entry

Objects or SubmissionSet Object from the event, the result of this Stored Query would contain one or more of these Objects.

In an XDS Affinity Domain context, the applicable events are likely to be Register Document Set [ITI-42] transaction containing one or more Document Entry objects. In this case, the Document Metadata Notification Broker may have to map between the model within which the events took place, and the Document Sharing metadata model.

7790

A good understanding of the Registry Stored Query transaction and the XDS metadata is necessary to understand how the filter expressions work. For example, if the filter expression below were implemented as a stored query on the registry

7795

```
<rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">
    <rim:Slot name="$XDSDocumentEntryPatientId">
        <rim:ValueList>
            <rim:Value>'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Slot name="$XDSDocumentEntryEventCodeList">
        <rim:ValueList>
            <rim:Value>('44950^^codScheme','44955^^codScheme','44960^^codScheme','
44970^^codScheme','44979^^codScheme')</rim:Value>
        </rim:ValueList>
    </rim:Slot>
</rim:AdhocQuery>
```

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7805

it will return all document entries for patient with ID st3498702 (assigned by an authority identified by the OID 1.3.6.1.4.1.21367.2005.3.7) where the event code metadata contains at least one of the codes listed (in this case CPT codes for various appendectomies). When used as a filter expression, the same structure will yield a match against a document entry in an XDS registry submission, where the document entry is for patient with ID st3498702 and the event code is "44970". The following snippet shows an example of such a submission:

7810

7815

```
<lcm:SubmitObjectsRequest>
    <rim:RegistryObjectList>
        <rim:ExtrinsicObject id="Document01" mimeType="text/xml" objectType="urn:uuid:7edca82f-
054d-47f2-a032-9b2a5b5186c1">
...
            <rim:Classification classificationScheme="urn:uuid:2c6b8cb7-8b2a-4051-b291-
b1ae6a575ef4" classifiedObject="Document01" nodeRepresentation="44950">
                <rim:Name>
                    <rim:LocalizedString value="Appendectomy"/>
                </rim:Name>
                <rim:Slot name="codingScheme">
                    <rim:ValueList>
                        <rim:Value>CPT codes</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
            </rim:Classification>
...
            <rim:ExternalIdentifier id="ei01" registryObject="Document01"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"
value="'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'">
                <rim:Name>
                    <rim:LocalizedString value="XDSDocumentEntry.patientId"/>
                </rim:Name>
```

7820

7825

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7840
```
          </rim:ExternalIdentifier>
...
        <rim:ExtrinsicObject>
    </rim:RegistryObjectList>
</lcm:SubmitObjectsRequest>
```

7845 When a Document Metadata Notification Subscriber constructs a filter expression, it shall include the whole stored query expression (as shown above) directly in the Subscribe Request message as a child of the wsnt:Filter element:

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7870
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7880
7885
7890
```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://www.w3.org/2005/08/addressing"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
    xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
    xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
    <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeRequest</a:Action>
        <a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
    </s:Header>
    <s:Body>
        <wsnt:Subscribe>
            <!-- The Recipient on whose behalf the subscription is requested - the address where
the notification is to be sent -->
            <wsnt:ConsumerReference>
                <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
            </wsnt:ConsumerReference>
            <wsnt:Filter>
                <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
1/TopicExpression/Simple">ihe:FullDocumentEntry</wsnt:TopicExpression>
                <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
                    <rim:Slot name="$XDSDocumentEntryPatientId">
                        <rim:ValueList>

<rim:Value>'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rim:Value>
                        </rim:ValueList>
                    </rim:Slot>
                    <rim:Slot name="$XDSDocumentEntryEventCodeList">
                        <rim:ValueList>

<rim:Value>('44950^^codScheme','44955^^codScheme','44960^^codScheme','
44970^^codScheme','44979^^codScheme')</rim:Value>
                        </rim:ValueList>
                    </rim:Slot>
                </rim:AdhocQuery>
            </wsnt:Filter>
            <wsnt:InitialTerminationTime>2008-07-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
        </wsnt:Subscribe>
    </s:Body>
</s:Envelope>
```

7895 How the Document Metadata Notification Broker evaluates the filter expression, and how it performs the matching against the existing subscriptions, is out of scope of this transaction. It is expected that such implementation details will allow vendors to differentiate themselves in the marketplace.

It is important to note that not all stored queries, and not all parameters defined for the stored queries, are suitable for filter expressions. The Document Metadata Notification Broker shall support the following filters and associated parameters when used in subscription requests, and the Document Metadata Subscriber may support a subset of these:

3.52.5.2.1 Subscriptions for DocumentEntry metadata

A Document Metadata Notification Broker that accepts a Subscribe Request containing filter expressions created using DocumentEntry metadata shall yield a match as described in Section 3.52.5.2. Parameters that can be used for creating the filter expression are described below:

1. **$XDSDocumentEntryPatientId**: this required parameter contains the patient ID for which a document entry is being registered in the XDS Document Registry

2. **$XDSDocumentEntryClassCode**: this parameter matches against the **XDSDocumentEntry.classCode** metadata elements in a given registry submission

3. **$XDSDocumentEntryTypeCode**: this parameter matches against the **XDSDocumentEntry.typeCode** metadata elements in a given registry submission

4. **$XDSDocumentEntryReferenceIdList**: this parameter matches against the **XDSDocumentEntry.referenceIdList** metadata elements in a given registry submission

   Note: The ReferenceIdList attribute is optional. If the parameter is specified, the filter matches only documents where the ID contains the value conveyed in the parameter. If the document does not contain a value in the ReferenceIdList, there is no match.

5. **$XDSDocumentEntryPracticeSettingCode**: this parameter matches against the **XDSDocumentEntry.practiceSettingCode** metadata elements in a given registry submission

6. **$XDSDocumentEntryHealthcareFacilityTypeCode**: this parameter matches against the **XDSDocumentEntry.healthcareFacilityTypeCode** metadata elements in a given registry submission

7. **$XDSDocumentEntryEventCodeList**: this parameter matches against the **XDSDocumentEntry.eventCodeList** metadata elements in a given registry submission

8. **$XDSDocumentEntryConfidentialityCode**: this parameter matches against the **XDSDocumentEntry.confidentialityCode** metadata elements in a given registry submission

9. **$XDSDocumentEntryFormatCode**: this parameter matches against the **XDSDocumentEntry.formatCode** metadata elements in a given registry submission

10. **$XDSDocumentEntryAuthorPerson**: this parameter matches against the **XDSDocumentEntry.author** metadata elements in a given registry submission. All properties of this parameter specified in ITI TF-2a: 3.18.4.1.2.3.7.1 are applicable in this transaction.

7935 The AdHocQuery/@id attribute SHALL store an identifier specific for the type of filter used in creating the subscription. The UUID that identifies subscriptions for DocumentEntry's metadata is:

"urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66".

An example of subscription on a document filter is presented below:

```
7940  <?xml version="1.0" encoding="UTF-8"?>
       <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
           xmlns:a="http://www.w3.org/2005/08/addressing"
           xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
           xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
7945       xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
           xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
       envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
       http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
       urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
7950       <s:Header>
               <a:Action>http://docs.oasis-open.org/wsn/bw-
       2/NotificationProducer/SubscribeRequest</a:Action>
               <a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
               <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
7955       </s:Header>
           <s:Body>
               <wsnt:Subscribe>
                   <!-- The Recipient on whose behalf the subscription is requested - the address where
       the notification is to be sent -->
7960               <wsnt:ConsumerReference>
                       <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
                   </wsnt:ConsumerReference>
                   <wsnt:Filter>
                       <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
7965   1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:TopicExpression>
                       <rim:AdhocQuery id="urn:uuid:aa2332d0-f8fe-11e0-be50-0800200c9a66">
                           <rim:Slot name="$XDSDocumentEntryPatientId">
                               <rim:ValueList>
                                   <rim:Value>'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rim
7970   :Value>
                               </rim:ValueList>
                           </rim:Slot>
                           <rim:Slot name="$XDSDocumentEntryHealthcareFacilityTypeCode">
                               <rim:ValueList>
7975                               <rim:Value>('Emergency
       Department^^healthcareFacilityCodingScheme')</rim:Value>
                               </rim:ValueList>
                           </rim:Slot>
                       </rim:AdhocQuery>
7980               </wsnt:Filter>
                   <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
               </wsnt:Subscribe>
           </s:Body>
       </s:Envelope>
```

7985

3.52.5.2.2 Subscriptions for SubmissionSets metadata

Document Metadata Notification Broker that accepts a Subscribe Request containing a filter expression based on the FindSubmissionSets stored query shall yield a match as described in Section 3.52.5.2. The subscription filter expression represents a subset of the

7990 FindSubmissionSets query parameters, with a specific extension. A Document Metadata Subscriber MAY be able to create a filter expression that includes XDSSubmissionSet.patientId, XDSSubmissionSet.sourceId, XDSSubmissionSet.author and XDSSubmissionSet.intendedRecipient. Parameters that can be used for this type of filter are described below:

7995   1. **$XDSSubmissionSetPatientId**: this is a required parameter that contains the identifier of the patient target of the clinical content published by a submission and represent the value of the XDSSubmissionSet.PatientId metadata;

    2. **$XDSSubmissionSetSourceId**: this optional parameter identifies the source of the content published by the submission and represent the value of the
8000   XDSSubmissionSets.sourceId metadata;

    3. **$XDSSubmissionSetAuthor**: this optional parameter identifies the author person of the content published by the submission and represents the value of the XDSSubmissionSets.author metadata. This parameter may be multi-valued;

    4. **$XDSSubmissionSetIntendedRecipient**: this is an optional parameter for the
8005   subscription. A Document Metadata Subscriber shall be able to subscribe this parameter in addition to other parameters which have direct correspondence with query parameters. This parameter represents the value of the XDSSubmissionSet.intendedRecipient metadata. This parameter identifies initial targets intended for a submission. This parameter may be multi-valued.

8010   Note: intendedRecipient attribute is optional. If the parameter is specified, the filter matches only submissionSets where the intendedRecipient contains the value conveyed in the parameter. If the document does not contain a value in the intendedRecipient, there is no match.

The AdHocQuery/@id attribute SHALL contain an identifier specific for the type of filter used in creating the subscription. The UUID that identifies subscriptions for SubmissionSet's
8015 metadata is:

    "urn:uuid:fbede94e-dbdc-4f6b-bc1f-d730e677cece"

An example of subscription on a SubmissionSet filter is presented below:

```
8020
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://www.w3.org/2005/08/addressing"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
    xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
8025
    xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd">
    <s:Header>
8030
        <a:Action>http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeRequest</a:Action>
        <a:MessageID>382dcdc7-8e84-9fdc-8443-48fd83bca938</a:MessageID>
        <a:To s:mustUnderstand="1">http://localhost:8080/services/initiatingGateway/query</a:To>
    </s:Header>
8035
    <s:Body>
        <wsnt:Subscribe>
```

```
              <!-- The Recipient on whose behalf the subscription is requested - the address where
      the notification is to be sent -->
              <wsnt:ConsumerReference>
8040              <a:Address>https://NotificationRecipientServer/xdsBnotification</a:Address>
              </wsnt:ConsumerReference>
              <wsnt:Filter>
                  <wsnt:TopicExpression Dialect="http://docs.oasis-open.org/wsn/t-
      1/TopicExpression/Simple">ihe:SubmissionSetMetadata</wsnt:TopicExpression>
8045              <rim:AdhocQuery id="urn:uuid:fbede94e-dbdc-4f6b-bc1f-d730e677cece">
                      <rim:Slot name="$XDSSubmissionSetPatientId">
                          <rim:ValueList>
                              <rim:Value>'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'</rim
      :Value>
8050                      </rim:ValueList>
                      </rim:Slot>
                      <rim:Slot name="$XDSSubmissionSetIntendedRecipient">
                          <rim:ValueList>
                              <rim:Value>('Some Hospital%')</rim:Value>
8055                          <rim:Value>('|Welby%')</rim:Value>
                          </rim:ValueList>
                      </rim:Slot>
                  </rim:AdhocQuery>
              </wsnt:Filter>
8060          <wsnt:InitialTerminationTime>2010-05-31T00:00:00.00000Z</wsnt:InitialTerminationTime>
          </wsnt:Subscribe>
      </s:Body>
      </s:Envelope>
```

3.52.5.3 Combining topics and filter expressions

8065 A topic defines static rules for creating notifications. This transaction defines four topics in Section 3.52.5.1. Each subscription request shall contain exactly one topic expression.

A filter expression is equivalent to a specific stored query with certain parameters. Filter conditions expressed as query parameters and used in the expressions must satisfy the same requirements as a corresponding Registry Stored Query:

8070 • the values for all specified query parameters must match (AND all different parameters)

• at least one of the values of multi-valued parameters must match (OR the values in a multi-valued query parameter)

Topics, defined in Section 3.52.5.1 and filter expressions, defined in Section 3.52.5.2, can only be used in specific combinations. These combinations are described in Table 3.52.5.3-1:

8075 **Table 3.52.5.3-1: Topics and Filter Expression Combinations**

Filter Expression	Topic Expression
subscription for DocumentEntry	ihe:FullDocumentEntry
	ihe:MinimalDocumentEntry
subscription for SubmissionSets	ihe:SubmissionSetMetadata

3.52.6 Security Considerations

The risk assessment for the Document Metadata Subscribe transaction is described in the risk assessment spreadsheet for the Document Metadata Subscription Profile, which is available from IHE at http://wiki.ihe.net/images/4/46/DSUB_risk_assesment.xls. The derived mitigations are as follows:

- Document Metadata Subscriber and Document Metadata Notification Broker shall be grouped with a Secure Node or Secure Application in the Audit Trail and Node Authentication (ATNA) Profile.

- The use of encrypted TLS is recommended when the transmission is not otherwise secured (e.g., transmission over a secure network)

As it is possible through the document metadata subscribe transaction to maliciously overload the Document Metadata Notification Recipient Actors, it is recommended that a strong authentication be used in combination with access rights enforcement and that authentication data should be conveyed through the Cross-Enterprise User Assertion (XUA) Profile. This recommendation also addresses the possibility of malicious cancellations of subscriptions.

Additionally, it is recommended that organizational measures be taken to avoid:

- overload of a Document Metadata Notification Recipient through subscription which cannot be cancelled because the subscription id has been lost e.g., through an administrative service allowing cancellation of subscription under well-defined circumstances

- cancellation of a subscription unnoticed by the intended document metadata notification recipient e.g., through an informative message (out of the scope of this transaction) sent to the intended recipient

This profile provides the ihe:MinimalDocumentEntry topic expression to avoid disclosing sensitive information. Using this type of topic expression allows delegation of the access control decisions to the Document Sharing infrastructure.

3.52.6.1 Audit Record Considerations

The Document Metadata Subscribe transaction is a Query Information event as defined in Table ITI TF-2a: 3.20.4.1.1.1-1. The actors involved shall record audit events according to the following:

3.52.6.1.1 Document Metadata Subscriber audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"C" (Create) for Subscribe message exchange "D" (Delete) for Unsubscribe message exchange
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-52", "IHE Transactions", "Document Metadata Subscribe")
Source (Document Metadata Subscriber) (1)			
Human Requestor (0..n)			
Destination (Document Metadata Notification Broker) (1)			
Audit Source (Document Metadata Subscriber) (1)			
Subscription (0..1)			
Patient (0..1)			
Query Parameters (0..1) (required for Subscribe message, not used for Unsubscribe message)			

Where:

Source AuditMessage/ ActiveParticipant	*UserID*	*U*	*not specialized*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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*

8115

8120

Destination AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Subscription (if known) (AuditMessage/ ParticipantObjectIdentificatio n)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-52", "IHE Transactions", "Document Metadata Subscribe")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	For the Subscribe Message, the URI contained in the <wsnt:SubscriptionReference/wsa:Address/> For the Unsubscribe message, the URI contained in the <soap12:Header/wsa:Address/>
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

Patient (if known) (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

8125

	Field Name	Opt	Value Constraints
Query Parameters *(AuditMessage/ ParticipantObjectIde ntification)*	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-52", "IHE Transactions", "Document Metadata Subscribe")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of <wsnt:Subscribe/wsnt:Filter/rim:AdhocQuery/@id/>
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	The value of <wsnt:Subscribe/> element, base64 encoded.
	ParticipantObjectDetail	*U*	*not specialized*

8130

3.52.6.1.2 Document Metadata Notification Broker audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"C" (Create) for Subscribe message exchange "D" (Delete) for Unsubscribe message exchange
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-52", "IHE Transactions", "Document Metadata Subscribe")
Source (Document Metadata Subscriber) (1)			
Destination (Document Metadata Notification Broker) (1)			
Audit Source (Document Metadata Notification Broker) (1)			
Subscription (0..1)			
Patient (0..1)			
Query Parameters (0..1) (required for Subscribe message, not used for Unsubscribe message)			

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

8135

Destination AuditMessage/ ActiveParticipant	UserID	M	SOAP endpoint URI.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	U	*not specialized*
	UserIsRequestor	U	*not specialized*
	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

8140

Audit Source AuditMessage/ AuditSourceIdentificati on	*AuditSourceID*	U	*not specialized*
	AuditEnterpriseSiteID	U	*not specialized*
	AuditSourceTypeCode	U	*not specialized*

Subscription (if known) (AuditMessage/ ParticipantObjectIdentificatio n)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	U	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-52", "IHE Transactions", "Document Metadata Subscribe ")
	ParticipantObjectSensitivity	U	*not specialized*
	ParticipantObjectID	M	For the Subscribe Message, the URI contained in the <wsnt:SubscriptionReference/wsa:Address/> For the Unsubscribe message, the URI contained in the <soap12:Header/wsa:Address/>
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	U	*not specialized*

Patient (If known) (AuditMessage/ ParticipantObjectIde ntification)	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 in HL7 CX format.
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	U	*not specialized*

8145

| Query Parameters (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-52", "IHE Transactions", "Document Metadata Subscribe")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of <wsnt:Subscribe/wsnt:Filter/rim:AdhocQuery/@id/>
	ParticipantObjectQuery	M	The value of <wsnt:Subscribe/> element, base64 encoded.
	ParticipantObjectDetail	*U*	*not specialized*

3.53 Document Metadata Notify [ITI-53]

8150

This section corresponds to Transaction ITI-53 of the IHE IT Infrastructure Technical Framework. Transaction ITI-53 is used by the Document Metadata Notification Recipient and the Document Metadata Notification Broker Actors.

3.53.1 Scope

8155 This transaction delivers a notification from the Document Metadata Notification Broker to the Document Metadata Notification Recipient about an event which matches an existing subscription.

3.53.2 Use Case Roles
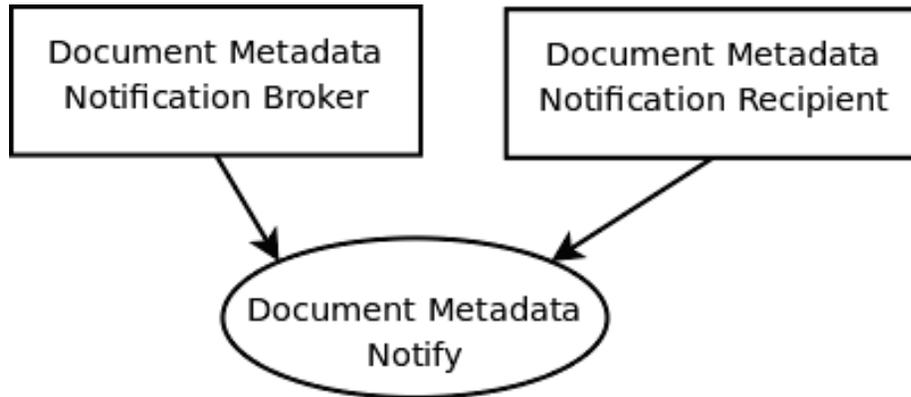
8160

Actor: Document Metadata Notification Broker

Role: Sends notifications to subscribed Document Metadata Notification Recipients based on received Publish transactions

Actor: Document Metadata Notification Recipient

8165 **Role:** Receives and processes notifications about events matching a set of filter expressions.

3.53.3 Referenced Standards

- OASIS Web Services Notification Family of Standards

- WS-BaseNotification 1.3 OASIS Standard

- WS-BrokeredNotification 1.3 OASIS Standard

8170
- WS-Topics 1.3 OASIS Standard

- ITI TF-2b: 3.43.4.2.2

- ITI TF-2x: Appendix V

3.53.4 Interaction Diagram
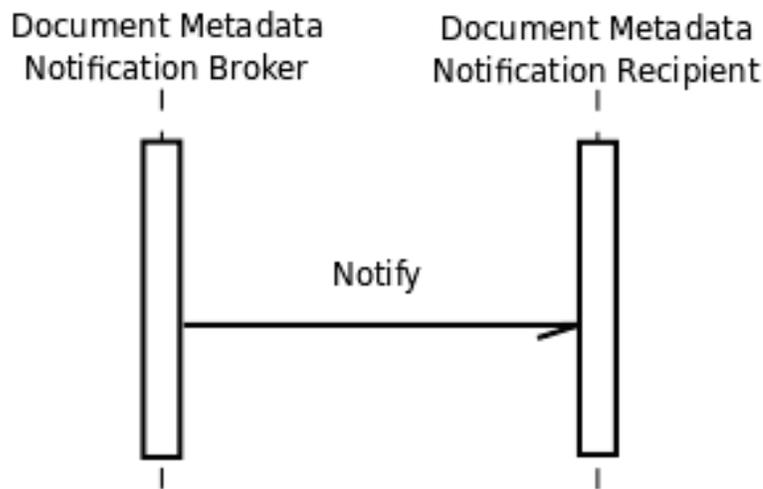
8175
Figure 3.53.4-1: Document Metadata Notify Sequence

3.53.4.1 Notify Message

3.53.4.1.1 Trigger

When an event occurs where the topics of the event match the filter requirements of one or more
8180 existing subscriptions, the Document Metadata Notification Broker will trigger a Notification
message to the corresponding Document Metadata Notification Recipient. The description of
matching subscriptions to events can be found in Section 3.52.5.2.

3.53.4.1.2 Message Semantics

The Notify message shall comply with the requirements in the WS-BaseNotification standard.
8185 Note that the value of the WS-Addressing Action element is prescribed in the standard, and
differs from the requirements of ITI TF-2x: Appendix V.

The Notify message convey in the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* the event that matched with a subscription. Depending on the event which triggered the notification, there may be one or more Document Entry Objects, Folder Objects, or SubmissionSet Objects whose metadata matches the filter conditions of any particular subscription. This transaction defines the following structures for conveying a Notify message:

A Full Notification, which shall be sent if the subscription request included the topic ihe:FullDocumentEntry (see Section 3.52.5.1). In this case, the notification shall consist of parts of the payload of a Register Document Set-b Transaction as defined in Section 3.42.4.1. The *<lcm:SubmitObjectsRequest>* element is the only child of the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element in this message. The *<rim:RegistryObjectList>* element shall be the only child of the *<lcm:SubmitObjectsRequest>* element. Only *<rim:ExtrinsicObject>* elements representing Document Entries shall be sent within the *<rim:RegistryObjectList>* element.

A Minimal Notification, which shall be sent if the subscription request included the topic ihe:MinimalDocumentEntry. In this case, the notification shall consist of parts of the payload of a Register Document Set-b transaction as defined in Section 3.42.4.1. The *<lcm:SubmitObjectsRequest>* element is the only child of the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element in this message. The *<rim:RegistryObjectList>* element shall be the only child of the *<lcm:SubmitObjectsRequest>* element. Only *<rim:ObjectRef>* elements representing Document Entries shall be sent within the *<rim:RegistryObjectList>* element.

A submissionSet Notification, which shall be sent if the subscription request included the topic ihe:SubmissionSetMetadata. In this case the response consists of parts of the payload of a Register Document Set-b Transaction as defined in Section 3.42.4.1. The *<lcm:SubmitObjectsRequest>* element is the only child of the *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element in this message. The *<rim:RegistryObjectList>* element shall be the only child of the *<lcm:SubmitObjectsRequest>* element. Only one *<rim:RegistryPackage>* element representing the submissionSet object shall be sent within the *<rim:RegistryObjectList>* element and shall be characterized by classification scheme: classificationScheme="urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd" (that represents an object of submissionSet type).

There shall be a single *wsnt:Notify/wsnt:NotificationMessage/wsnt:Message* element in this transaction. If multiple objects need to be represented in a single notification, the WS-BaseNotification standard allows this to be done.

3.53.4.1.3 Expected Actions

The Document Metadata Notification Recipient shall accept the Notify message. The Notify message shall be processed according to the configuration and business logic of the actor. Possibilities include conveying the notification information to other systems and/or users.

8230 The Document Metadata Notification Broker may send the filter conditions of the subscription, and/or the address (either a logical identifier or a service address url) of the Notification Broker that produces the notification. Both of these alternatives increase certain security risks, their use should be determined by local policy for security and confidentiality.

3.53.4.1.4 Examples

3.53.4.1.4.1 Full Notification Example (ihe:FullDocumentEntry)

```
8235  <?xml version="1.0" encoding="UTF-8"?>
       <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
           xmlns:a="http://www.w3.org/2005/08/addressing"
           xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
           xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
8240       xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
           xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
           xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
       envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
       http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
8245   urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd" urn:oasis:names:tc:ebxml-
       regrep:xsd:lcm:3.0 ../schema/ebRS/lcm.xsd">
           <s:Header>
               <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
               <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
8250           <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
           </s:Header>
           <s:Body>
               <wsnt:Notify>
                   <wsnt:NotificationMessage>
8255               <wsnt:SubscriptionReference>
                       <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
       8443-48fd83bca938</a:Address>
                   </wsnt:SubscriptionReference>
                   <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-
8260   1/TopicExpression/Simple">ihe:FullDocumentEntry</wsnt:Topic>
                   <wsnt:ProducerReference>
                       <a:Address>https://ProducerReference</a:Address>
                   </wsnt:ProducerReference>
                   <wsnt:Message>
8265               <lcm:SubmitObjectsRequest>
                       <rim:RegistryObjectList>
                           <rim:ExtrinsicObject id="Document01" mimeType="text/xml"
       objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
       ...
8270                       <rim:Classification classificationScheme="urn:uuid:2c6b8cb7-8b2a-
       4051-b291-b1ae6a575ef4" classifiedObject="Document01" nodeRepresentation="44950">
                               <rim:Name>
                                   <rim:LocalizedString value="Appendectomy"/>
                               </rim:Name>
8275                           <rim:Slot name="codingScheme">
                                   <rim:ValueList>
                                       <rim:Value>CPT codes</rim:Value>
                                   </rim:ValueList>
                               </rim:Slot>
8280                       </rim:Classification>
       ...
                           <rim:ExternalIdentifier id="ei01" registryObject="Document01"
       identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427"
       value="'st3498702^^^&amp;1.3.6.1.4.1.21367.2005.3.7&amp;ISO'">
8285                           <rim:Name>
                                   <rim:LocalizedString value="XDSDocumentEntry.patientId"/>
                               </rim:Name>
```

```
                            </rim:ExternalIdentifier>
8290    ...
                                <rim:ExtrinsicObject>
                            </rim:RegistryObjectList>
                        </lcm:SubmitObjectsRequest>
                    </wsnt:Message>
                </wsnt:NotificationMessage>
8295        </wsnt:Notify>
        </s:Body>
</s:Envelope>
```

3.53.4.1.4.2 Minimal Notification Example (ihe:MinimalDocumentEntry)

```
8300    <?xml version="1.0" encoding="UTF-8"?>
        <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
            xmlns:a="http://www.w3.org/2005/08/addressing"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
8305        xmlns:xds="urn:ihe:iti:xds-b:2007"
            xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
            xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
        envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
        http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd urn:ihe:iti:xds-b:2007
8310    ../../schema/IHE/XDS.b_DocumentRepository.xsd urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0
        ../../schema/ebRS/rim.xsd">
            <s:Header>
                <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
                <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
8315            <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
            </s:Header>
            <s:Body>
                <wsnt:Notify>
                    <wsnt:NotificationMessage>
8320                    <wsnt:SubscriptionReference>
                            <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
        8443-48fd83bca938</a:Address>
                        </wsnt:SubscriptionReference>
                        <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-
8325    1/TopicExpression/Simple">ihe:MinimalDocumentEntry</wsnt:Topic>
                        <wsnt:ProducerReference>
                            <a:Address>https://ProducerReference</a:Address>
                        </wsnt:ProducerReference>
                        <wsnt:Message>
8330                        <lcm:SubmitObjectsRequest>
                                <rim:RegistryObjectList>
                                    <rim:ObjectRef id="urn:uuid:93606bcf-9494-43ec-9b4e-a7748d1a838d" />
                                </rim:RegistryObjectList>
                            </lcm:SubmitObjectsRequest>
8335                    </wsnt:Message>
                    </wsnt:NotificationMessage>
                </wsnt:Notify>
            </s:Body>
        </s:Envelope>
```

3.53.4.1.4.3 SubmissionSet Notification Example (ihe:SubmissionSetMetadata)

```
        <?xml version="1.0" encoding="UTF-8"?>
        <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
8345        xmlns:a="http://www.w3.org/2005/08/addressing"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
            xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
```

```
        xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
        xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
8350  envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
      http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd
      urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0 ../schema/ebRS/rim.xsd" urn:oasis:names:tc:ebxml-
      regrep:xsd:lcm:3.0 ../schema/ebRS/lcm.xsd">
          <s:Header>
8355          <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
              <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
              <a:To>https://NotificationRecipientServer/xdsBnotification</a:To>
          </s:Header>
          <s:Body>
8360          <wsnt:Notify>
                  <wsnt:NotificationMessage>
                      <wsnt:SubscriptionReference>
                          <a:Address>https://NotificationBrokerServer/Subscription/382dcdc7-8e84-9fdc-
      8443-48fd83bca938</a:Address>
8365                  </wsnt:SubscriptionReference>
                      <wsnt:Topic Dialect="http://docs.oasis-open.org/wsn/t-1/TopicExpression/Simple"
                          >ihe:SubmissionSetMetadata</wsnt:Topic>
                      <wsnt:ProducerReference>
                          <a:Address>https://ProducerReference</a:Address>
8370                  </wsnt:ProducerReference>
                      <wsnt:Message>
                          <lcm:SubmitObjectsRequest
                              xsi:schemaLocation="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
      ../../schema/ebRS/lcm.xsd"
8375                          xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0"
                              xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                              xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
                              xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
                              <rim:RegistryObjectList>
8380                              <rim:RegistryPackage id="SubmissionSet01">

                                      <!-- here all the SubmissionSet metadata -->

                                  </rim:RegistryPackage>
8385                              <rim:Classification id="cl10" classifiedObject="SubmissionSet01"
                                      classificationNode="urn:uuid:a54d6aa5-d40d-43f9-88c5-
      b4633d873bdd"/>
                              </rim:RegistryObjectList>
                          </lcm:SubmitObjectsRequest>
8390                  </wsnt:Message>
                  </wsnt:NotificationMessage>
              </wsnt:Notify>
          </s:Body>
      </s:Envelope>
```

8395 3.53.5 Security Considerations

The risk assessment for the Document Metadata Notify transaction is described in the risk assessment spreadsheet for the Document Metadata Subscription Profile, which is available from IHE at http://wiki.ihe.net/images/4/46/DSUB_risk_assesment.xls. The derived mitigations are as follows:

8400 Document Metadata Notification Broker and Document Metadata Notification Recipients shall be grouped with a Secure Node or Secure Application in the Audit Trail and Node Authentication (ATNA) Profile.

The use of encrypted TLS is recommended when the transmission is not otherwise secured (e.g., transmission over a secure network)

8405   Additionally, it is recommended that the Document Metadata Notify transaction be associated with a SAML assertion outlining authorizations to the notification content so that the Document Metadata Notification Recipient will be able to enforce these authorizations (for example, see the Cross-Enterprise User Assertion (XUA) Profile ITI TF-1:13). This recommendation is highly dependent on an XDS Affinity Domain managing roles for its users correctly as most of the

8410   authorizations will be based on roles.

3.53.5.1 Audit Record Considerations

The Document Metadata Notify transaction is an Export event, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1. The actors involved in the transaction shall create audit data in conformance with DICOM Part 15 "Data Export"/"Data Import", with the following exceptions.

8415   **3.53.5.1.1 Document Metadata Notification Recipient audit message:**

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-53", "IHE Transactions", "Document Metadata Notify")
Source (Document Metadata Notification Broker) (1)			
Destination (Document Metadata Notification Recipient) (1)			
Human Requestor (0..n)			
Audit Source (Document Metadata Notification Recipient) (1)			
Patient (0..1)			
DocumentEntry/SubmissionSet (1..n)			

Where:

	Field Name	Opt	Value Constraints
Source **AuditMessage/** **ActiveParticipant**	UserID	M	When WS-Addressing is used: <From/>
	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

	Field Name	Opt	Value Constraints
Destination **AuditMessage/** **ActiveParticipant**	*UserID*	*U*	*not specialized*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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

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*

8420

Audit Source AuditMessage/ AuditSourceIdentificati on	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient (if-known) (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 in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

DocumentEntry SubmissionSet (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	The Document Metadata Notification Recipient shall include one of the following values, depending on the specific object in the message: EV("urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1", "IHE XDS Metadata", "document entry object type") EV("urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248", "IHE XDS Metadata", "on-demand document entry object type") EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classification node")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of the object's EntryUUID attribute.
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*

	ParticipantObjectDetail	C	This element is required, if known: Type: "urn:ihe:iti:xca:2010:homeCommunityId" (literal string) Value: value of the homeCommunityId

3.53.5.1.2 Document Metadata Notification Broker audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-53", "IHE Transactions", "Document Metadata Notify")
Source (Document Metadata Notification Broker) (1)			
Destination (Document Metadata Notification Recipient) (1)			
Audit Source (Document Metadata Notification Broker) (1)			
DocumentEntry/SubmissionSet (1..n)			

8425   Where:

	UserID	M	When WS-Addressing is used: <From/>
Source **AuditMessage/** **ActiveParticipant**	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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

	UserID	*U*	*not specialized*
Destination **AuditMessage/** **ActiveParticipant**	*AlternativeUserID*	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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

	AuditSourceID	*U*	*not specialized*
Audit Source **AuditMessage/** **AuditSourceIdentific** **ation**	*AuditEnterpriseSiteID*	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

8430

| DocumentEntry SubmissionSet	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
(AuditMessage/ ParticipantObjectIdentifi cation)	ParticipantObjectIDTypeCode	M	The Document Metadata Notification Broker shall include one of the following values, depending on the specific object in the message: EV("urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1", "IHE XDS Metadata", "document entry object type") EV("urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248", "IHE XDS Metadata", "on-demand document entry object type") EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classification node")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of the object's EntryUUID attribute.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	C	This element is required, if known: Type: "urn:ihe:iti:xca:2010:homeCommunityId" (literal string) Value: value of the homeCommunityId

3.54 Document Metadata Publish [ITI-54]

This section corresponds to Transaction ITI-54 of the IHE IT Infrastructure Technical Framework. Transaction ITI-54 is used by the Document Metadata Notification Broker and
8435 Document Metadata Publisher Actors.

3.54.1 Scope

This transaction delivers information from the Document Metadata Publisher to the Document Metadata Notification Broker about an event which may have a subscription. The WS Brokered Notification Publisher Registration requirements are out of scope for this transaction.

8440 ### 3.54.2 Use Case Roles
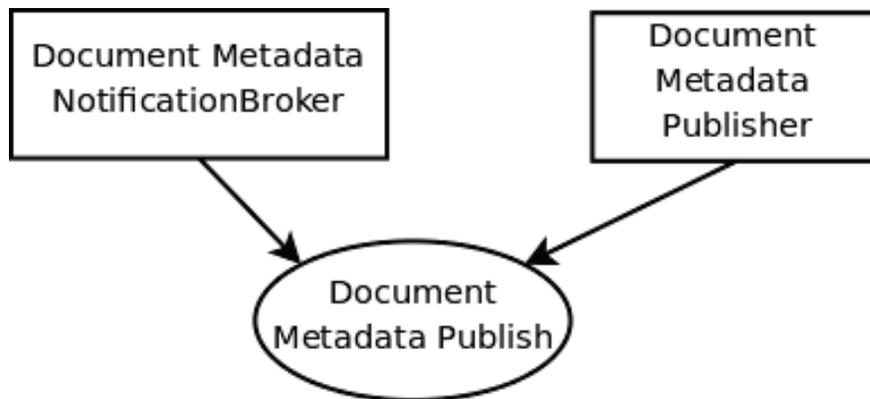
Actor: Document Metadata Notification Broker

**Role:** Receives and processes information about events for which there may be a subscription.

Actor: Document Metadata Publisher

Role: Publishes information to the Document Metadata Notification Broker when applicable events occur for which a subscription may exist.

3.54.3 Referenced Standards

- OASIS Web Services Notification Family of Standards
- WS-BaseNotification 1.3 OASIS Standard
- WS-BrokeredNotification 1.3 OASIS Standard
- WS-Topics 1.3 OASIS Standard
- ITI TF-2b: 3.43.4.2.2
- ITI TF-2x: Appendix V

3.54.4 Interaction Diagram
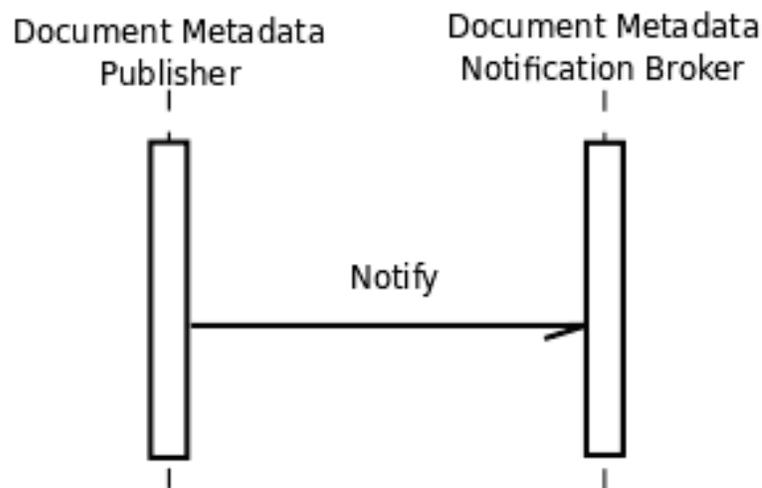
Figure 3.54.4-1: Document Metadata Publish Sequence

3.54.4.1 Notify Message

3.54.4.1.1 Trigger

When an event occurs for which a subscription may exist, the Document Metadata Publisher will trigger a Notification message to the Document Metadata Notification Broker. Events that could trigger a notification are publication of or update to a DocumentEntry or SubmissionSet.

3.54.4.1.2 Message Semantics

The Document Metadata Publisher shall use a Notify message to communicate published objects
to the Document Metadata Notification Broker Actor.

This message shall have one *<NotificationMessage>* element.

This element SHALL have two child elements:

- *<ProducerReference>* that identifies the source of the data published. This element
  conveys the value of the SubmissionSet.sourceId attribute. This attribute shall contain a
  URI, for example "urn:oid:1.2.3.4.5".

- *<Message>* that identifies published objects. This element shall have a single child
  element *<lcm:SubmitObjectsRequest>* that has only one child element
  <rim:RegistryObjectList>. This element conveys a list of SubmissionSet, Folder, and
  DocumentEntry objects.

  Note: SubmissionSet objects are constructed from *<rim:RegistryObject>* elements and must include the
  <rim:Classification>.

Note that there is no subscription information in the Notify message in the Publish transaction.

3.54.4.1.3 Expected Actions

The Notify message shall comply with the requirements in the WS-BaseNotification standard.

The Document Metadata Notification Broker shall evaluate the Publish transaction, and if there
are matching subscriptions, it shall send the corresponding Notification transaction to the
appropriate Document Metadata Notification Recipients.

3.54.4.1.4 Example

```
<?xml version="1.0" encoding="UTF-8"?>
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://www.w3.org/2005/08/addressing"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
    xmlns:ihe="urn:ihe:iti:pub-sub:2008"
    xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
    xsi:schemaLocation="http://www.w3.org/2003/05/soap-envelope http://www.w3.org/2003/05/soap-
envelope http://www.w3.org/2005/08/addressing http://www.w3.org/2005/08/addressing/ws-addr.xsd
http://docs.oasis-open.org/wsn/b-2 http://docs.oasis-open.org/wsn/b-2.xsd urn:ihe:iti:pub-
sub:2008 ../schema/IHE/XDS.b_PublishSubscribe.xsd urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0
../schema/ebRS/rim.xsd">
    <s:Header>
        <a:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</a:Action>
        <a:MessageID>382dcdca-8e87-9fdf-8446-48fd83bca93b</a:MessageID>
        <a:To>https://NotificationBroker/xdsBpublish</a:To>
    </s:Header>
    <s:Body>
        <wsnt:Notify>
            <wsnt:NotificationMessage>
                <wsnt:ProducerReference>
                    <a:Address>urn:oid:1.2.3.4.5</a:Address>
                </wsnt:ProducerReference>
                <wsnt:Message>
                    <lcm:SubmitObjectsRequest>
                        <rim:RegistryObjectList>
                            <!-- The list of extrinsic objects -->
```

```
                              <rim:ExtrinsicObject id="Document01" mimeType="text/xml"
objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1">
                              …
                              </rim:ExtrinsicObject>
<!-- The list of RegistryPackage objects -->
                              <rim:RegistryPackage objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:RegistryPackage" id="Submission01">
                                      <rim:Classification classificationNode="urn:uuid:a54d6aa5-d40d-
43f9-88c5-b4633d873bdd" classifiedObject="Submission01" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification" id="classification01"/>
                              </rim:RegistryPackage>
                              <rim:RegistryPackage objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:RegistryPackage" id="Folder01">
                                      <rim:Classification classificationNode="urn:uuid:d9d542f3-6cc4-
48b6-8870-ea235fbc94c2" classifiedObject="Folder01" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification" id="classification02"/>
                              </rim:RegistryPackage>
                      </rim:RegistryObjectList>
                  </lcm:SubmitObjectsRequest>
              </wsnt:Message>
          </wsnt:NotificationMessage>
       </wsnt:Notify>
    </s:Body>
</s:Envelope>
```

3.54.5 Security Considerations

The risk assessment for the Document Metadata Publish transaction is described in the risk
assessment spreadsheet for the Document Metadata Subscription Profile, which is available from
IHE at http://wiki.ihe.net/images/4/46/DSUB_risk_assesment.xls. The derived mitigations are as
follows:

- The Document Metadata Publisher and the Document Metadata Notification Broker shall
  be grouped with a Secure Node or Secure Application in the Audit Trail and Node
  Authentication (ATNA) Profile.

- The use of encrypted TLS is recommended when the transmission is not otherwise
  secured (e.g., transmission over a secure network)

3.54.5.1 Audit Record Considerations

The Document Metadata Publish Transaction is an Export event, as defined in ITI TF-2a: Table
3.20.4.1.1.1-1. The actors involved in the transaction shall create audit data in conformance with
DICOM Part 15 "Data Export"/"Data Import", with the following exceptions.

3.54.5.1.1 Document Metadata Publisher Audit Message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-54", "IHE Transactions", "Document Metadata Publish")
Source (Document Metadata Publisher) (1)			
Human Requestor (0..n)			
Destination (Document Metadata Notification Broker) (1)			
Audit Source (Document Metadata Publisher) (1)			
Patient (0..1)			
DocumentEntry/SubmissionSet (1..n)			

8555   Where:

Source **AuditMessage/** **ActiveParticipant**	*UserID*	*U*	*not specialized*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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	C	SOAP endpoint URI
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	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/** **AuditSourceIdentificati** **on**	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

	ParticipantObjectTypeCode	M	"1" (Person)
Patient (if-known) (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

8560

	ParticipantObjectTypeCode	M	"2" (System)
DocumentEntry SubmissionSet (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	The Document Metadata Publisher actor shall include one of the following values, depending on the specific object in the message: EV("urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1", "IHE XDS Metadata", "document entry object type") EV("urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248", "IHE XDS Metadata", "on-demand document entry object type") EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classification node")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The value of the object's EntryUUID attribute.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	C	This element is required, if known: Type: "urn:ihe:iti:xca:2010:homeCommunityId" (literal string) Value: value of the homeCommunityId

3.54.5.1.2 Document Metadata Notification Broker audit message:

	Field Name	**Opt**	**Value Constraints**
Event AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-54", "IHE Transactions", "Document Metadata Publish")
Source (Document Metadata Publisher) (1)			
Destination (Document Metadata Notification Broker) (1)			
Audit Source (Document Metadata Notification Broker) (1)			
DocumentEntry/SubmissionSet (1..n)			

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	C	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	U	*not specialized*
	UserIsRequestor	U	*not specialized*
	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

8565

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

DocumentEntry SubmissionSet (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	U	*not specialized*
	ParticipantObjectIDTypeCode	M	The Document Metadata Notification Broker shall include one of the following values, depending on the specific object in the message: EV("urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1", "IHE XDS Metadata", "document entry object type") EV("urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248", "IHE XDS Metadata", "on-demand document entry object type") EV(urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classification node")
	ParticipantObjectSensitivity	U	*not specialized*
	ParticipantObjectID	M	The value of the object's EntryUUID attribute.
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	C	This element is required, if known: Type: "urn:ihe:iti:xca:2010:homeCommunityId" (literal string) Value: value of the homeCommunityId

3.55 Cross Gateway Patient Discovery [ITI-55]

This section corresponds to transaction ITI-55 of the IHE ITI Technical Framework. Transaction ITI-55 is used by the Initiating Gateway and Responding Gateway Actors.

3.55.1 Scope

The Cross Gateway Patient Discovery transaction supports the ability for Initiating Gateways and Responding Gateways to discover mutually known patients. This transaction assumes an environment where patient data is well described and high quality demographic data is available.

Because the transaction supports the mutual discovery of patients it can be seen as having dual purposes.

- To support a query by the Initiating Gateway requesting a demographically matching patient from within the Responding Gateway's community.

- To support a feed to Responding Gateway announcing that the patient is known by the Initiating Gateway's community.

This dual nature of the transaction is chosen for scalability purposes, as demographic matching algorithms are expensive on a large scale and once a match is identified it is important that both the initiating and responding sides of the transaction can use the results of that successful match.

The Cross Gateway Patient Discovery transaction has several modes, useful in different environments:

- Demographic Query only mode – in this mode only the demographics of the patient are included in the request. The initiating community does not have, or does not choose to specify, a patient identifier for use by the Responding Gateway.

- Demographic Query and Feed – in this mode both the demographic and initiating community identifier are included in the request.

- Shared/national Patient Identifier Query and Feed – in this mode only a shared/national identifier is specified. Demographics are not necessary because matching can be done on the identifier alone.

This transaction can be used synchronously and asynchronously.

The Cross Gateway Patient Discovery request asks for information about patients whose demographic data match data provided in the query message. The request is received by the Responding Gateway Actor. The Responding Gateway indicates in its response whether the community has knowledge of a patient matching the set of demographic data and, if a match is found, returns the demographics known by the responding community. If more than one match is

8600 found the Responding Gateway has the option of providing a list[5] of matching patients or returning nothing. When nothing is returned the Responding Gateway may include in the response a set of additional demographic attributes which, if supplied, would aid in disambiguating the multiple matches.

In the case of a match, the Responding Gateway may further update its own cache to indicate
8605 that the initiating community knows this patient and should be queried if data for this patient is desired.

The criteria used for demographic matching is defined by policy and not specified here, but fully enabled by the transaction.

3.55.2 Use Case Roles
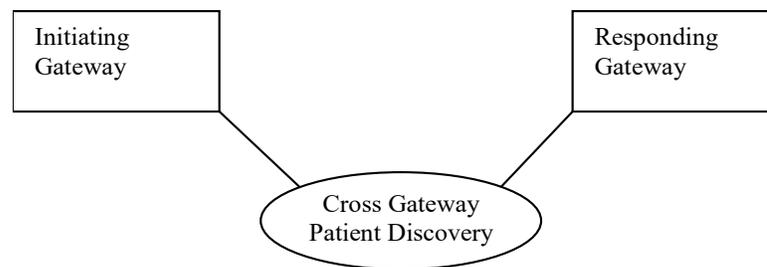
8610

Actor: Initiating Gateway

Role: Requests the Responding Gateway to indicate whether the community has knowledge of a patient matching a set of demographic criteria.

8615 **Corresponding HL7 v3 Application Roles**:

Person Registry Query Placer (PRPA_AR201303UV02)

Actor: Responding Gateway

Role: If a demographics match is found, returns demographics known by the responding community. If more than one match is found the Responding Gateway has the option of
8620 providing a small list of matching patients or returning no match. In the case of no match, the Responding Gateway may provide a list of additional demographic attributes needed to disambiguate multiple matches.

---

[5] Returning a list of matches may potentially expose information that is unrelated to the patient requested. Implementers are encouraged to consider ways to keep the number of elements in a list to a minimum. Deployment organizations may choose to declare a limit to the number of elements allowed to be returned.

**Corresponding HL7 v3 Application Roles:**

Person Registry Query Fulfiller (PRPA_AR201304UV02)

3.55.3 Referenced Standard

HL7 Version 3 Edition 2008, Patient Administration DSTU, Patient Topic (found at http://www.hl7.org/memonly/downloads/v3edition.cfm#V32008)

Implementers of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V Web Services for IHE Transactions

3.55.4 Interaction Diagram
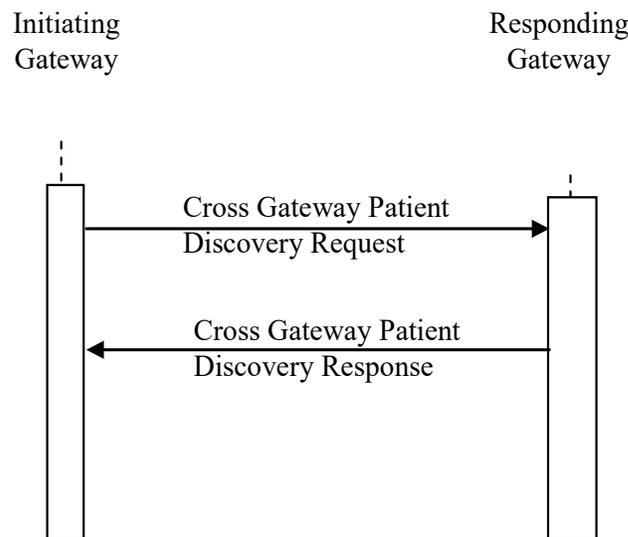
3.55.4.1 Cross Gateway Patient Discovery Request

The Cross Gateway Patient Discovery Request is implemented using the HL7 Patient Registry Query by Demographics (PRPA_MT201306UV02) message.

3.55.4.1.1 Trigger Events

The initiating community needs to determine whether a patient is known by another community. Specific possible trigger events include, but are not limited to:

- The initiating community registers a new patient who has permitted sharing of healthcare data with external communities.

- A healthcare provider within the community requests that records regarding a particular patient be accessed from a particular external community or all external communities known.

3.55.4.1.2 Message Semantics

The components of the Patient Registry Query by Demographics message with cardinality greater than 0 (as shown below) are required, and the detailed description of the message is provided in Sections 3.55.4.1.2.1 to 3.55.4.1.2.3.

For each element which is required, the element shall be specified by the Initiating Gateway in the request and shall be used by the Responding Gateway as part of its demographic matching algorithm.

For each element which is optional the element does not need to be specified by the Initiating Gateway in the request but, if specified, shall be used by the Responding Gateway as part of its demographic matching algorithm.

The Responding Gateway shall support Asynchronous Web Services Exchange as described in ITI TF-2x: V.5, Synchronous and Asynchronous Web Services Exchange. If the Initiating Gateway declares the Asynchronous Web Services Exchange Option it shall also support Asynchronous Web Services Exchange as described in ITI TF-2x: V.5. Use of Asynchronous Web Services Exchange is necessary when transactions scale to large numbers of communities because it allows for more efficient handling of latency and scale.

The Initiating Gateway may specify a duration value in the SOAP Header element of the request. This value suggests to the Responding Gateway a length of time that the Initiating Gateway recommends caching any correlation resulting from the interaction. The duration value is specified in the SOAP Header using the CorrelationTimeToLive element and contains a value conformant with the xs:duration type defined in http://www.w3.org/TR/xmlschema-2/#duration. If no CorrelationTimeToLive element is specified in the SOAP Header the Responding Gateway shall interpret this as a recommendation against caching, unless a mutually agreed policy states otherwise.

An example of specifying the CorrelationTimeToLive element follows, which recommends caching of 7 days.

```
<xcpd:CorrelationTimeToLive>P0Y0M7D</xcpd:CorrelationTimeToLive>
```

3.55.4.1.2.1 Major Components of the Patient Registry Query by Demographics

LivingSubjectName Parameter

This required parameter specifies the name of the person whose information is being queried. If multiple instances of LivingSubjectName are provided, the receiver shall consider them as possible alternatives, logically connected with an "or". Within each LivingSubjectName element, a single person name (PN) data item shall be specified in the LivingSubjectName.value attribute. An Initiating Gateway may specify all, or only a subset of the name parts within the PN data type (e.g., family name). The use attribute of the value element shall not be set to "SRCH".

LivingSubjectAdministrativeGender Parameter

This optional parameter specifies the administrative gender of the person whose information is being queried. For this parameter item, a single administrative gender code shall be specified in the LivingSubjectAdministrativeGender.value attribute.

LivingSubjectBirthTime Parameter

This required parameter specifies the birth data and time of the person whose information is being queried. This parameter can convey an exact moment (e.g., January 1, 1960 @ 03:00:00 EST), an approximate date (e.g., January 1960), or even a range of dates (e.g., December 1, 1959 through March 31, 1960).

PatientAddress Parameter

This optional parameter specifies one or more addresses associated with the person whose information is being queried.

LivingSubjectId Parameter

This optional repeating parameter specifies an identifier associated with the patient whose information is being queried (e.g., a local identifier, or an account identifier). If this parameter is specified, LivingSubjectName and LivingSubjectBirthTime are optional. This feature allows this query to be used when a national/shared patient identifier is known. The identifier specified in the LivingSubjectId.value attribute is expressed using the II data type. Please see ITI TF-2x: Appendix E for the use of the II data type for patient identifiers.

The Initiating Gateway has the option of designating one of the identifiers in LivingSubjectId as the patient identifier that the Responding Gateway may use in an XCA Cross Gateway Query to the community represented by the Initiating Gateway (see Section 3.55.4.1.2.4) .

LivingSubjectBirthPlaceAddress Parameter

This optional parameter specifies the birth address of the patient.

LivingSubjectBirthPlaceName Parameter

This optional parameter specifies the name of the entity (like hospital name) where the patient was born.

MothersMaidenName Parameter

This optional parameter specifies the maiden name of the mother of the person whose information is being queried. For this parameter item, a single person name (PN) data item shall be specified in the Person.value attribute. Within the PN data type, the given name and family name may be specified. The use attribute of the value element shall not be set to "SRCH"

PatientTelecom

This optional parameter specifies a telecommunication address or addresses for communication with the patient.

PrincipalCareProviderId

This optional parameter specifies the care provider identifier of a person who has been assigned as the principal care provider of this patient. The requestor may specify multiple PrincipalCareProviderId elements which the responder shall consider as possible alternatives, logically connected with an "or". Within each PrincipalCareProviderId element, a single identifier shall be specified in the PrincipalCareProviderId.value attribute.

3.55.4.1.2.2 Message Information Model of the Patient Registry Query by Demographics Message

Below is the Message Information Model for the Query by Demographics message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict subset of the *Patient Registry Query by Demographics (PRPA_RM201306UV02) RMIM*.

The base RMIM can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201306UV.htm. The following restrictions were made on the original RMIMs to arrive at the restricted model:

- The optional attributes ParameterList.id, MatchCriterionList.id, QueryByParameter responseElementGroupId, QueryByParameter.modifyCode, and QueryByParameter.executionAndDeliveryTime were omitted from the model.

- QueryByParameter.responsePriorityCode is required and is either I (Immediate) or D (Deferred). See Section 3.55.6.2 for use of Deferred.

- QueryByParameter.responseModalityCode is required and is fixed to R (Real Time).

- QueryByParameter.statusCode is defaulted to "new".

- The data type of MatchAlgorithm.value is constrained to ST.

- The data type of MinimumDegreeMatch.value is constrained to INT between 0 and 100.

- The data type of LivingSubjectName.value is constrained to PN.

- The optional SortControl was omitted from the model.

- The optional MatchWeight was omitted from the model.

- The following optional parameters were omitted from the model:

  - PatientStatusCode

  - LivingSubjectDeceaseTime

  - OtherIDsScopingOrganization

  - initialQuantity

  - initialQuantityCode

The attributes of this model are described in the following table:
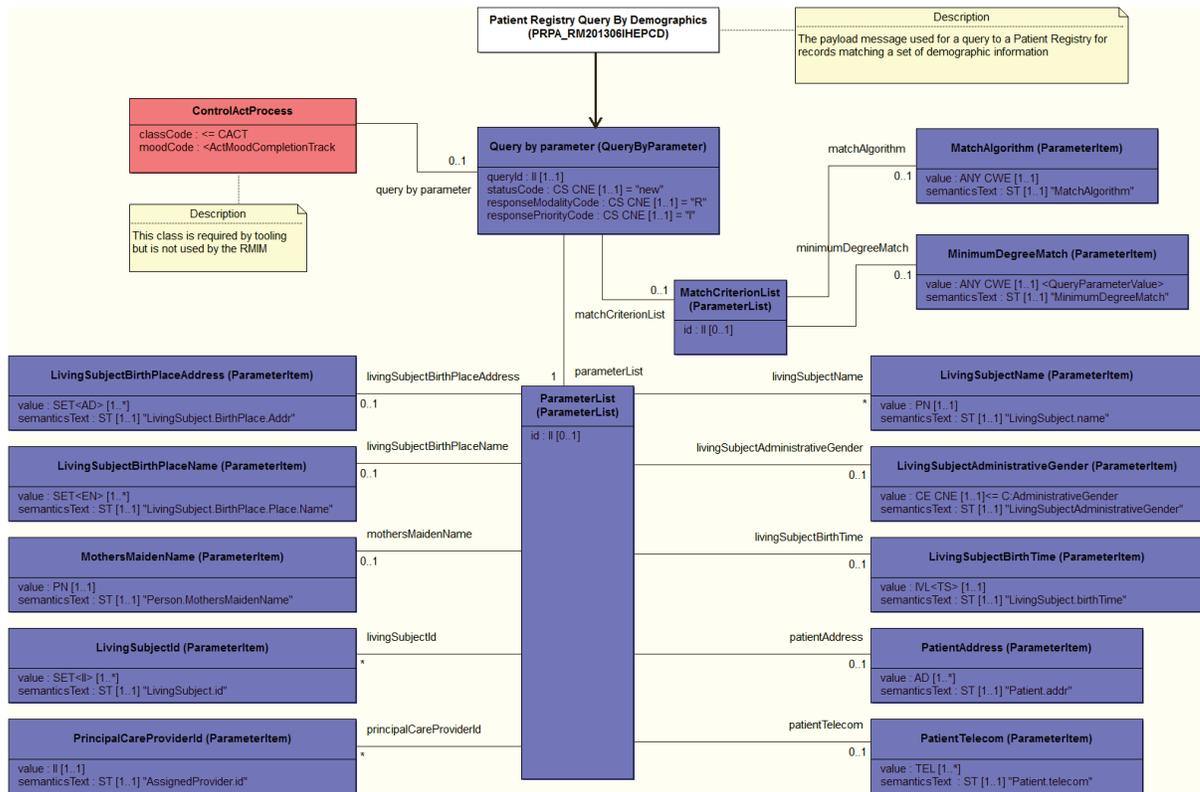
Figure 3.55.4.1.2-1: Patient Registry Query by Demographics Message

Table 3.55.4.1.2-1:

PRPA_HD201306IHE Patient Registry Query by Demographics	This HMD extract defines the message used to query a community for patients matching a set of demographics information. **Derived from Figure 3.55.4.1.2-1 (PRPA_RM201306IHEXCPD)**
QueryByParameter	The entry point for the domain content in this query
queryId [1..1] QueryByParameter (II)	Unique identifier for the query
statusCode [1..1] (M) QueryByParameter (CS) {CNE:QueryStatusCode, fixed value="new"}	The status of the query, shall be "new"
responseModalityCode [1..1] QueryByParameter (CS) {CNE:ResponseModality, fixed value="R"}	The mode of the response – always real-time.
responsePriorityCode [1..1] QueryByParameter (CS) {CNE:QueryPriority}	Either "I" or "D" shall be specified. "I" (Immediate) indicates that the Responding Gateway is required to send an immediate response. "D" (Deferred) indicates the Responding Gateway is required to send a deferred response, see Section 3.55.6.2.
initialQuantity [0..1] QueryByParameter (INT)	Not supported, any value will be ignored by responder.

PRPA_HD201306IHE Patient Registry Query by Demographics	This HMD extract defines the message used to query a community for patients matching a set of demographics information. Derived from Figure 3.55.4.1.2-1 (PRPA_RM201306IHEXCPD)
initialQuantityCode [0..1] QueryByParameter (CE) {CWE:QueryRequestLimit, default="RD"}	Not supported, any value will be ignored by responder.
MatchAlgorithm	This parameter conveys instructions to the Responding Gateway specifying the preferred matching algorithm to use and may be ignored
value [1..1] ParameterItem (ST)	The name of the algorithm
semanticsText [1..1] ParameterItem (ST){default= "MatchAlgorithm"}	
MinimumDegreeMatch	This parameter conveys instructions to the Responding Gateway specifying minimum degree of match to use in filtering results and may be ignored
value [1..1] ParameterItem (INT)	The numeric value of the degree of match. Shall be value between 0 and 100 .
semanticsText [1..1] ParameterItem (ST){default= "MinimumDegreeMatch"}	
LivingSubjectAdministrativeGender	This query parameter is a code representing the administrative gender of a person in a patient registry.
value [1..1] ParameterItem (CE) {CWE:AdministrativeGender}	
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.administrativeGender"}	
LivingSubjectBirthTime	This query parameter is the birth date of a living subject.
value [1..1] ParameterItem (IVL<TS>)	A date or date range. This parameter can convey an exact moment (e.g., January 1, 1960 @ 03:00:00 EST), an approximate date (e.g., January 1960), or even a range of dates (e.g., December 1, 1959 through March 31, 1960).
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.birthTime"}	
LivingSubjectId	
value [1..*] (M) ParameterItem (II)	A patient identifier, used to assist in finding a match for the query and, when so designated by the Initiating Gateway, used by the Responding Gateway in a XCA Cross Gateway Query directed to the Community designated by the homeCommunityId value specified in the Control Act Wrapper – see Section 3.55.4.1.2.4.
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.id"}	
LivingSubjectName	This query parameter is the name of a person. If multiple instances of LivingSubjectName are provided, the receiver must consider them as possible alternatives, logically connected with an "or".

PRPA_HD201306IHE **Patient Registry Query by Demographics**	**This HMD extract defines the message used to query a community for patients matching a set of demographics information.** **Derived from Figure 3.55.4.1.2-1 (PRPA_RM201306IHEXCPD)**
value [1..1] ParameterItem (PN)	Only one instance of the value element is allowed. Only some of the name parts may be populated. If, for example, only the family and given name parts of a person's name are sent, then the query would match all persons with that family name and given name regardless of their initials. The use attribute of the value element shall not be set to "SRCH".
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.name"}	
PatientAddress	This query parameter is a postal address for corresponding with a patient. There shall be only a single PatientAddress element.
value [1..*] ParameterItem (AD)	Multiple instances of the value element within a Patient Address may be specified and are combined with OR logic.
semanticsText [1..1] ParameterItem (ST){default= "Patient.addr"}	
LivingSubjectBirthPlaceAddress	This query parameter is a patient's birthplace represented as an address
value [1..*] ParameterItem (SET<AD>)	
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.BirthPlace.Addr"}	
LivingSubjectBirthPlaceName	This query parameter is a patient's birthplace represented as a place name
value [1..*] ParameterItem (SET<EN>)	
semanticsText [1..1] ParameterItem (ST){default= "LivingSubject.BirthPlace.Place.Name"}	
PrincipalCareProviderId	This query parameter is the care provider identifier of a person who has been assigned as the principal care provider of this patient. The requestor may specify multiple PrincipalCareProviderId elements which responder shall consider as possible alternatives, logically connected with an "or".
value [1..1] ParameterItem (II)	There shall have only one id in the "value" attribute.
semanticsText [1..1] ParameterItem (ST){default= "AssignedProvider.id"}	

PRPA_HD201306IHE **Patient Registry Query by Demographics**	**This HMD extract defines the message used to query a community for patients matching a set of demographics information.** **Derived from Figure 3.55.4.1.2-1 (PRPA_RM201306IHEXCPD)**
MothersMaidenName	This query parameter is the maiden name of a focal person's mother. It is included as a parameter because it is a common attribute for confirming the identity of persons in some registries. This parameter does not map to a single RIM attribute, instead, in RIM terms Mother's maiden name is the person name part of "family" with an EntityNamePartQualifier of "birth" for the person who is the player in a PersonalRelationship of type of "mother" to the focal person.
value [1..1] ParameterItem (PN)	A person name. In this case it may consist of only the given name part, the family name part, or both.
semanticsText [1..1] ParameterItem (ST){default= "Person.MothersMaidenName"}	
PatientTelecom	This query parameter is a telecommunications address for communicating with a living subject in the context of the target patient registry. It could be a telephone number, fax number or even an email address. There shall be only a single PatientTelecom element.
value [1..*] ParameterItem (TEL)	A telecommunications address. The scheme attribute specifies whether this is a telephone number, fax number, email address, etc. Multiple instances of the value element within a PatientTelecom may be specified and are combined with OR logic.
semanticsText [1..1] ParameterItem (ST){default= "Patient.telecom"}	

3.55.4.1.2.3 Control Act and Transmission Wrappers

Please see ITI TF-2x: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.55.4.1.2-2 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

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Table 3.55.4.1.2-2: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000100UV01 - Send Message Payload	QUQI_MT021001UV01 - Query Control Act Request : Query By Parameter
The value of interactionId shall be set to PRPA_IN201305UV02 The value of processingModeCode shall be set to T The acceptAckCode shall be set to AL There shall be only one receiver Device	The value of ControlActProcess.moodCode shall be set to EVN The trigger event code in ControlActProcess.code shall be set to PRPA_TE201305UV02 If an authorOrPerformer participation is present, the value of authorOrPerformer.typeCode SHALL be set to AUT

The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see ITI TF-2x: Appendix W. The schemas from the HL7 V3 2008 Normative Edition can be found at:

8760   Edition2008/processable/multicacheschemas/PRPA_IN201305UV02.xsd)

3.55.4.1.2.4 Values used by Responding Gateway for a reverse Cross Gateway Query

The Initiating Gateway shall specify two values in the request which allow the responding community to generate a reverse Cross Gateway Query in search of data about the patient
8765   identified in the Cross Gateway Patient Discovery request. The two values are homeCommunityId and community patient id assigning authority.

homeCommunityId – this value is a globally unique identifier for a community – further defined in Section 3.38.4.1.2.1. The Initiating Gateway shall specify this value in the Cross Gateway Patient Discovery request unless the Initiating Gateway is not grouped with a
8770   Responding Gateway.

The Responding Gateway uses the homeCommunityId to obtain the Web Services endpoint of services that provide access to data in the Initiating Gateway's community.

The homeCommunityId is specified as the id element within the Organization associated with the device of the sender. The id element designating the homeCommunityId shall have only the
8775   root element the contents of which is the homeCommunityId.
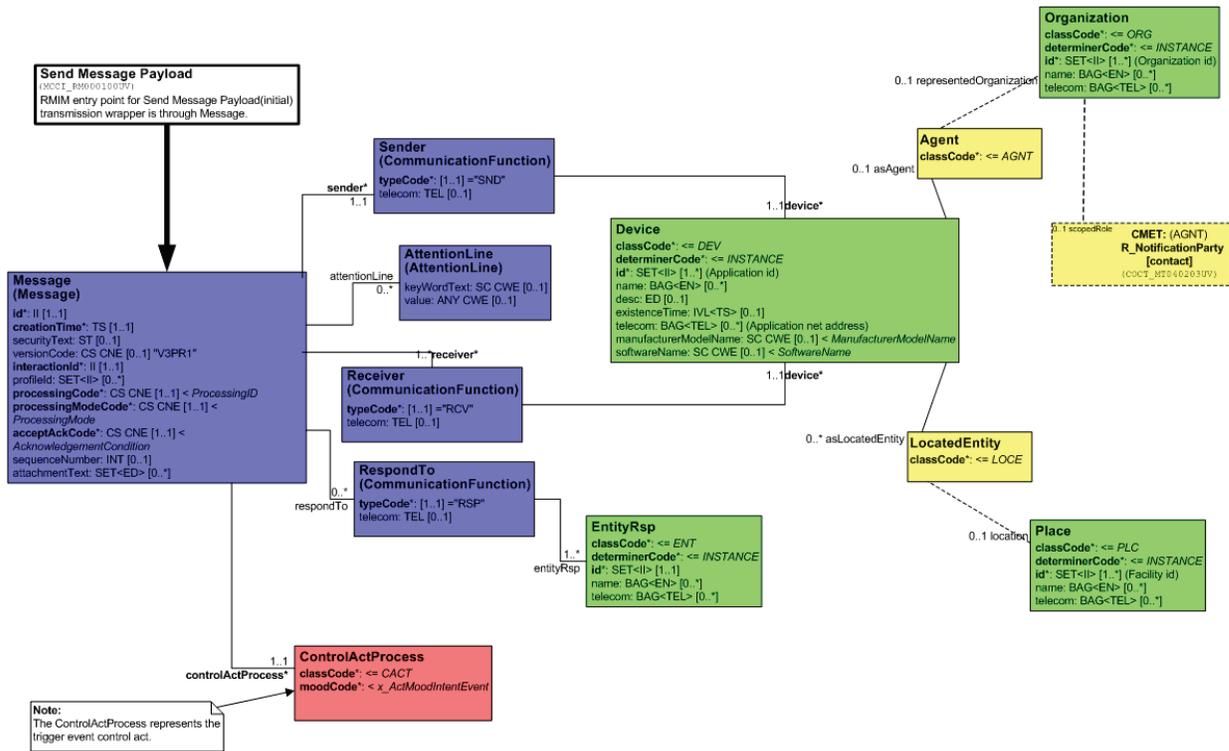
Figure 3.55.4.1.2.4-1: Send Message Payload

An example of specifying the homeCommunityId element follows, where
homeCommunityId=1.2.3.

```
<sender typeCode="SND">
    <device classCode="DEV" determinerCode="INSTANCE">
        <id root="1.2.840.114350.1.13.999.567"/>
        <asAgent classCode="AGNT">
            <representedOrganization classCode="ORG" determinerCode="INSTANCE">
                <!-- homeCommunityId=urn:oid:1.2.3 -->
                <id root="1.2.3"/>
            </representedOrganization>
        </asAgent>
    </device>
</sender>
```

Community patient id assigning authority – this value designates the assigning authority for
the patient identifier to be used within a reverse Cross Gateway Query. This value is not the
assigning authority for all patient identifiers used by that community, but only the patient
identifier used for the patient identified in the query. The Initiating Gateway shall be capable of
specifying this value in the Cross Gateway Patient Discovery request.

The Responding Gateway may use the specified assigning authority to identify which of the
LivingSubjectID values to use in a reverse Cross Gateway Query.

8800   The community patient id assigning authority is specified as the id element within the assignedDevice associated with the authorOrPerformer element. The id element designating the community patient id assigning authority shall have only the root element, the contents of which designate the assigning authority of the LivingSubjectId to be used in the reverse Cross Gateway Query.

8805   An example of specifying the community patient id assigning authority element follows, where the assigning authority specified is 1.2.840.114350.1.13.99997.2.3412 (see highlighted text) which identifies the first LivingSubjectID (root="1.2.840.114350.1.13.99997.2.3412" extension="1234") as the patient identifier to be used in a reverse Cross Gateway Query. In essence, the highlighted text must match to designate the patient identifier.

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```
<controlActProcess  classCode="CACT" moodCode="EVN">
    <code code="PRPA_TE201305UV02" codeSystem="2.16.840.1.113883.1.6"/>
    <!-- Identifies the first LivingSubjectID in the parameterList as the patient
        Identifier to be used by responder in a reverse Cross Gateway Query -->
    <authorOrPerformer typeCode="AUT">
          <assignedDevice>
                <id root="1.2.840.114350.1.13.99997.2.3412"/>
          </assignedDevice>
    </authorOrPerformer>

    <queryByParameter>
        <queryId root="1.2.840.114350.1.13.28.1.18.5.999" extension="18204"/>
        <statusCode code="new"/>
        <parameterList>
           <livingSubjectBirthTime>
              <value value="19630804"/>
              <semanticsText>LivingSubject..birthTime</semanticsText>
           </livingSubjectBirthTime>
            <livingSubjectName>
               <value>
                    <given>Jimmy</given>
                    <family>Jones</family>
               </value>
               <semanticsText>LivingSubject.name</semanticsText>
           </livingSubjectName>
           <LivingSubjectId>
              <value root="1.2.840.114350.1.13.99997.2.3412" extension="1234"/>
              <semanticsText>LivingSubject.id</semanticsText>
           </LivingSubjectId>
           <LivingSubjectId>
               <value root="2.16.840.1.113883.4.1" extension="58910"/>
               <semanticsText>LivingSubject.id</semanticsText>
           </LivingSubjectId>
        </parameterList>
    </queryByParameter>
</controlActProcess>
```

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Comparison of homeCommunityId and assigning authority

The value of homeCommunityId is an OID which may, or may not, also be an assigning authority. An assigning authority is designated by an OID and issues identifiers, in this case patient identifiers. A community's patient identifier assigning authority issues patient identifiers for patients managed by the community. It is possible for there to be more than one patient identifier assigning authority in a community. The Initiating Gateway must specify the right patient identifier assigning authority for the patient being described. There is only one homeCommunityId per community. This OID may also be used by the community as the patient identifier assigning authority, but this is not required and should not be expected. While both values are OID's they have no necessary relationship. In general it is expected that the homeCommunityId will be assigned by an organization which governs the interaction among communities. In many countries this will be facilitated by the government who will manage the community level agreements necessary for sharing and also assign homeCommunityIds. An assigning authority has no expected level of management, and there may be multiple patient identifier assigning authorities within a community.

3.55.4.1.3 Expected Actions

If responsePriorityCode is "I" the Responding Gateway shall return a Find Candidates Response message as specified in Section 3.55.4.2. The response message uses the Application Acknowledgement transmission wrapper, as specified in ITI TF-2x: O.1.3, and no other acknowledgments are part of this the transaction.

If responsePriorityCode is "D" and the Responding Gateway does not support the Deferred Response Option, it shall return an application error in the HL7 V3 Accept Acknowledgement with acknowledgeDetail to indicate Unsupported Processing Mode.

```
<MCCI_IN000002UV01 …
    ( . . . )
  <acknowledgement>
      <typeCode code="AE"/>
      <targetMessage>
          <id root="22a0f9e0-4454-11dc-a6be-3603d6866807"/>
      </targetMessage>
      <acknowledgementDetail typeCode="E">
          <code code="NS250" displayName="Unsupported processing mode"/>
          <text>Deferred Response not supported.</text>
      </acknowledgementDetail>
  </acknowledgement>
</MCCI_IN000002UV01>
```

If the Responding Gateway supports the Deferred Response Option, it shall respond as described in Section 3.55.6.2.

If the Responding Gateway is unable to process the request due to an internal error, such as the local Master Patient Index system is offline, the Responding Gateway shall return an application error as described in Section 3.55.4.2.3 Case 5.

The community associated with the Responding Gateway may make use of the homeCommunityId and community patient identifier assigning authority by initiating a Cross Gateway Query. See Section 3.55.4.1.2.4 for more information. This provisioning of the Responding Gateway community may be cached indefinitely, but efforts are needed to ensure that changes are properly reflected. For more detail about this issue refer to Section 3.55.4.2.3.1.

3.55.4.1.3.1 Query Parameter Processing

The Responding Gateway shall be capable of accepting, searching on, and responding with attributes in the Query Person by Demographics message.

Handling of phonetic issues, alternate spellings, upper and lower case, accented characters, etc., if deemed appropriate, is to be supported by the Responding Gateway rather than by the Initiating Gateway. The Responding Gateway shall return any matches to the query parameters that reflect a high degree of match, after consideration of all policy constraints; IHE does not further specify matching requirements, except as already discussed in the LivingSubjectName parameter description.

3.55.4.2 Cross Gateway Patient Discovery Response

The Cross Gateway Patient Discovery Response is implemented using the HL7 Patient Registry Find Candidates Response PRPA_MT201310UV02) message.

3.55.4.2.1 Trigger Events

The Patient Registry Find Candidates Response message (PRPA_MT201310UV02) is sent by the Responding Gateway in response to the query (PRPA_MT201306UV02) message previously received.

3.55.4.2.2 Message Semantics

The components of the message with cardinality greater than 0 (as shown below) are required, and the detailed description of the message is provided in Sections 3.55.4.2.2.1 to 3.55.4.2.2.7. All other attributes of the message are optional.

For each element that is required this means that it shall be provided by Responding Gateway, unless not available, and shall be accepted by requestor but requestor is not required to process the value in any way, only accept it without any error.

The Responding Gateway shall support Asynchronous Web Services Exchange as described in ITI TF-2x: V.5, Synchronous and Asynchronous Web Services Exchange. If the Initiating Gateway declares the Asynchronous Web Services Exchange Option it shall also support Asynchronous Web Services Exchange as described in ITI TF-2x: V.5. Use of Asynchronous Web Services Exchange is necessary when transactions scale to large numbers of communities because it allows for more efficient handling of latency and scale.

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The Responding Gateway may specify a duration value in the SOAP Header element of the response. This value suggests to the Initiating Gateway a length of time that the Responding Gateway recommends caching any correlation resulting from the interaction. The duration value is specified in the SOAP Header using the CorrelationTimeToLive element and contains a value conformant with the xs:duration type defined in http://www.w3.org/TR/xmlschema-2/#duration.

8930

If no CorrelationTimeToLive element is specified in the SOAP Header the Initiating Gateway shall interpret this as a recommendation against caching, unless a mutually agreed policy states otherwise.

An example of specifying the CorrelationTimeToLive element follows, which recommends caching of 7 days.

```
<xcpd:CorrelationTimeToLive>P0Y0M7D</xcpd:CorrelationTimeToLive>
```

8935

3.55.4.2.2.1 Major Components of the Patient Registry Find Candidates Response Message

This message shares all the major components of the Patient Activate/Revise messages, as described in Section 3.44.4.1.2.1. The only additional component is the QueryMatchObservation class.

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Query Match Observation

The QueryMatchObservation class is used to convey information about the quality of the match for each record returned by the query response.

3.55.4.2.2.2 Message Information Model of the Patient Registry Find Candidates Response Message

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Below is the Message Information Model for the Patient Registry Find Candidates Response message, as restricted for this transaction. The purpose of the model is to describe the data elements relevant for this transaction. It is a strict common subset of the Patient Registry Find Candidates Response (PRPA_RM201310UV02) RMIM.

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The base RMIM can be found on the HL7 V3 2008 Edition CD at Edition2008/domains/uvpa/editable/PRPA_RM201310UV.htm. The following restrictions were made on the original RMIMs to arrive at the restricted model:

- The focal entity choice is restricted to be only a person

- The relationship holder of the personal relationship is restricted to be a person (using CMET COCT_MT030207UV)

8955

- The following roles are omitted:

  - asPatientOfOtherProvider

  - guarantor

  - guardian

  - contactParty

8960
- asMember
- careGiver
- asStudent

The following participations are omitted:

- subjectOf2 (administrativeObservation)
8965
- coveredPartyOf (coverage)
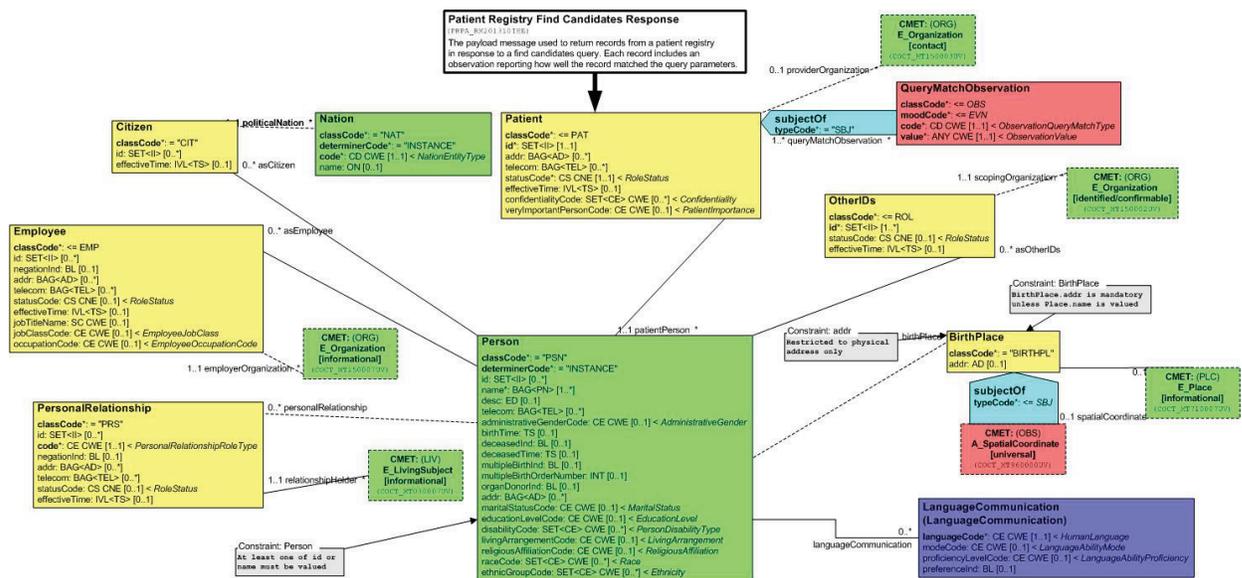
Figure 3.55.4.2.2-1: Patient Registry Find Candidates Response Message

The attributes of this model are described in the following table. Note that CMETs are not
8970 discussed, as the HL7 definitions for them are being used.

Table 3.55.4.2.2-1: Attributes

PRPA_HD201310IHE Patient Registry Find Candidates Response	This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query. Derived from Figure 3.55.4.2.2-1 (PRPA_RM201310IHE)
Patient	The primary record for the focal person
classCode [1..1] (M) Patient (CS) {CNE:PAT}	Structural attribute; this is a "patient" role

PRPA_HD201310IHE **Patient Registry Find Candidates Response**	**This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query.** **Derived from Figure 3.55.4.2.2-1 (PRPA_RM201310IHE)**
id [1..1] (M) Patient (SET<II>)	The Patient Identifier to be used in subsequent XCA Cross Gateway Query transactions related to this patient when sent to the Responding Gateway sending the response. All other patient identifiers shall be specified in the OtherIDs.id attribute.
statusCode [1..1] Patient (CS) {CNE:active, fixed value= "active"}	A value specifying the state of this record in a patient registry (based on the RIM role class state-machine). This record is active.
confidentialityCode [0..*] Patient (SET<CE>) {CWE:Confidentiality}	Value(s) that control the disclosure of information about this living subject as a patient
veryImportantPersonCode [0..1] Patient (CE) {CWE:PatientImportance}	A code specifying the patient's special status granted by the scoper organization, often resulting in preferred treatment and special considerations. Examples include board member, diplomat.
Person	A subtype of LivingSubject representing a human being Either Person.name or Patient.id must be non-null
classCode [1..1] (M) Person (CS) {CNE:PSN, fixed value= "PSN"}	Structural attribute; this is a "person" entity
determinerCode [1..1] (M) Person (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific person
name [1..*] Person (BAG<PN>)	Name(s) for this person. May be null i.e., <name nullFlavor="NA"/> only if the request contained only a patient identifier and no demographic data.
telecom [0..*] Person (BAG<TEL>)	Telecommunication address(es) for communicating with this person
administrativeGenderCode [0..1] Person (CE) {CWE:AdministrativeGender}	A value representing the gender (sex) of this person. Note: this attribute does not include terms related to clinical gender which is a complex physiological, genetic and sociological concept that requires multiple observations in order to be comprehensively described.
birthTime [0..1] Person (TS)	The date and time this person was born
birthPlace	
deceasedInd [0..1] Person (BL)	An indication that this person is dead
deceasedTime [0..1] Person (TS)	The date and time this person died
multipleBirthInd [0..1] Person (BL)	An indication that this person was part of a multiple birth

PRPA_HD201310IHE Patient Registry Find Candidates Response	This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query. Derived from Figure 3.55.4.2.2-1 (PRPA_RM201310IHE)
multipleBirthOrderNumber [0..1] Person (INT)	The order in which this person was born if part of a multiple birth
addr [0..*] Person (BAG<AD>)	Address(es) for corresponding with this person
maritalStatusCode [0..1] Person (CE) {CWE:MaritalStatus}	A value representing the domestic partnership status of this person
religiousAffiliationCode [0..1] Person (CE) {CWE:ReligiousAffiliation}	A value representing the primary religious preference of this person
raceCode [0..*] Person (SET<CE>) {CWE:Race}	A set of values representing the races of this person
ethnicGroupCode [0..*] Person (SET<CE>) {CWE:Ethnicity}	A set of values representing the ethnic groups of this person
OtherIDs	Used to capture additional identifiers for the person such as a Drivers' license or Social Security Number.
classCode [1..1] (M) Role (CS) {CNE:ROL}	Structural attribute. This can be any specialization of "role" except for Citizen, or Employee.,
id [1..*] (M) Role (SET<II>)	One or more identifiers issued to the focal person by the associated scopingOrganization (e.g., identifiers from a different Patient Identity Domain).
PersonalRelationship	A personal relationship between the focal living subject and another living subject
classCode [1..1] (M) Role (CS) {CNE:PRS, fixed value= "PRS"}	Structural attribute; this is a "personal relationship" role
id [0..*] Role (SET<II>)	Identifier(s) for this personal relationship
code [1..1] (M) Role (CE) {CWE:PersonalRelationshipRoleType}	A required value specifying the type of personal relationship between the relationshipHolder and the scoping living subject drawn from the PersonalRelationshipRoleType domain, for example, spouse, parent, unrelated friend
Citizen	Used to capture person information relating to citizenship.
classCode [1..1] (M) Role (CS) {CNE:CIT, fixed value= "CIT"}	Structural attribute; this is a "citizen" role
id [0..*] Role (SET<II>)	Identifier(s) for the focal person as a citizen of a nation
Nation	A politically organized body of people bonded by territory and known as a nation.
classCode [1..1] (M) Organization (CS) {CNE:NAT, fixed value= "NAT"}	Structural attribute; this is a 'nation' type of entity

PRPA_HD201310IHE **Patient Registry Find Candidates Response**	**This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query.** **Derived from Figure 3.55.4.2.2-1 (PRPA_RM201310IHE)**
determinerCode [1..1] (M) Organization (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific entity
code [1..1] (M) Organization (CD) {CWE:NationEntityType}	A value that identifies a nation state
name [0..1] Organization (ON)	A non-unique textual identifier or moniker for this nation
Employee	A relationship of the focal person with an organization to receive wages or salary. The purpose of this class is to identify the type of relationship the employee has to the employer rather than the nature of the work actually performed. For example, it can be used to capture whether the person is a Military Veteran or not..
classCode [1..1] (M) Employee (CS) {CNE:EMP}	Structural attribute; this is an "employee" role
statusCode [0..1] Employee (CS) {CNE:RoleStatus}	A value specifying the state of this employment relationship (based on the RIM Role class state-machine), for example, active, suspended, terminated.
occupationCode [0..1] Employee (CE) {CWE:EmployeeOccupationCode}	A code qualifying the classification of kind-of-work based upon a recognized industry or jurisdictional standard. OccupationCode is used to convey the person's occupation as opposed to jobClassCode (not used in this transaction) which characterizes this particular job. For example, it can be used to capture whether the person is a Military Veteran or not.
LanguageCommunication	A language communication capability of the focal person
languageCode [1..1] (M) LanguageCommunication (CE) {CWE:HumanLanguage}	A value representing a language for which the focal person has some level of proficiency for written or spoken communication. Examples: Spanish, Italian, German, English, American Sign
preferenceInd [0..1] LanguageCommunication (BL)	An indicator specifying whether or not this language is preferred by the focal person for the associated mode
QueryMatchObservation	Used to convey information about the quality of the match for each record.
classCode [1..1] (M) Observation (CS) {CNE:http://hl7.org/v3ballot2007may/html/infrastructure/vocabulary/ActClass.htm - ActClass, default= "OBS"}	Structural attribute – this is an observation

PRPA_HD201310IHE **Patient Registry Find Candidates Response**	This HMD extract defines the message used to return records from a patient registry in response to a Find Candidates Query. Derived from Figure 3.55.4.2.2-1 (PRPA_RM201310IHE)
moodCode [1..1] (M) Observation (CS) {CNE:http://hl7.org/v3ballot2007may/html/infrastructure/vocabulary/ActMood.htm - ActMood, default= "EVN"}	Structural attribute – this is an event
code [1..1] (M) Observation (CD) {CWE:QueryMatchObservationType}	A code, identifying this observation as a query match observation.
value [1..1] (M) QueryMatchObservation (INT)	A numeric value indicating the quality of match for this record. It shall correspond to the MinimumDegreeMatch.value attribute of the original query, and it shall have the same meaning (e.g., percentage, indicating confidence in the match).

3.55.4.2.2.3 Control Act and Transmission Wrappers

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Please see ITI TF-2X: Appendix O for details on the IHE guidelines for implementing the wrappers. Table 3.44.4.1.2-2 contains the Transmission and Control Act wrappers used for this interaction, and the associated constraints.

Table 3.55.4.4.2-2: Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper
MCCI_MT000300UV01 – Send Application Acknowledgement	MFMI_MT700711UV01 – Master File/Registry Query Response Control Act (Role Subject)
The value of interactionId shall be set to PRPA_IN201306UV02 The value of processingModeCode shall be set to T The acceptAckCode shall be set to NE There shall be only one receiver Device	The value of ControlActProcess.moodCode shall be set to EVN The trigger event code in ControlActProcess.code shall be set to PRPA_TE201306UV02 There shall be zero or more RegistrationEvents present in this message. For each matching record returned, there shall be exactly one RegistrationEvent present in this message. If a RegistrationEvent is part of the message, there shall be exactly one Patient role present in the payload. There shall be no replacementOf act-relationship present in this message The QueryAck.resultTotalQuantity, QueryAck.resultCurrentQuantity, and QueryAck.resultRemainingQuantity attributes shall not be populated. There shall be a QueryByParameter copy of the original query which shall be in the control act wrapper following the queryAck element.

The composite message schemas which describe the full payload of this interaction, including the wrappers, can be found online on the IHE FTP site, see Appendix W. The schemas from the HL7 V3 2008 Normative Edition can be found at:

Edition2008/processable/multicacheschemas/PRPA_IN201306UV02.xsd).

3.55.4.2.2.4 Specifying homeCommunityId in Response

The homeCommunityId is a globally unique identifier for a community – further defined in Section 3.38.4.1.2.1. The Responding Gateway shall specify this value within every RegistrationEvent element in the Cross Gateway Patient Discovery response.

The Responding Gateway may specify the same homeCommunityId in every RegistrationEvent, or may specify different homeCommunityId's. The Initiating Gateway shall interpret multiple RegistrationEvents as follows:

- Multiple RegistrationEvents with the same homeCommunityId represent multiple matches within the homeCommunityId identified community. The Initiating Gateway may choose one of the matches to use for subsequent processing.

- Each set of RegistrationEvents with the same homeComunityId represents a different possible source for documents, so in order to get the complete list of relevant documents for the patient, the Initiating Gateway shall select at least one RegistrationEvent from each set with the same homeCommunityId and use the resulting collection of patient identifiers for subsequent processing. See ITI TF-1: 27.3.2.2 for an introduction to this environment.

The homeCommunityId is specified as the id element within the assignedEntity of the custodian of the RegistrationEvent. The id element designating the homeCommunityId shall have only the root element, the contents of which is the homeCommunityId.

The following example shows part of a response specifying a homeCommunityId value of urn:oid:1.2.840.114350.1.13.99998.8734.

```
<subject typeCode="SUBJ">
    <registrationEvent classCode="REG" moodCode="EVN">
        <id nullFlavor="NA"/>
        <statusCode code="active"/>
        <subject1 typeCode="SBJ">
            … (details of the matching patient)
        </subject1>
        <custodian typeCode="CST">
            <assignedEntity classCode="ASSIGNED">
                <id root="1.2.840.114350.1.13.99998.8734"/>
                <code code="SupportsHealthDataLocator"
                    codeSystem="1.3.6.1.4.1.19376.1.2.27.2"/>
            </assignedEntity>
        </custodian>
    </registrationEvent>
```

```
    </subject>
```

9020 3.55.4.2.2.5 Specifying support as a Health Data Locator

The Responding Gateway shall specify its support for this patient as a Health Data Locator. This specification is a coded value within the assignedEntity of the custodian of the RegistrationEvent. The valid codes for this designation are described in Table 3.55.4.4.2-3. The codeSystem for these code elements is 1.3.6.1.4.1.19376.1.2.27.2.

9025   **Table 3.55.4.4.2-3: Coded values for codeSystem=1.3.6.1.4.1.19376.1.2.27.2**

Value for code	Meaning of code
NotHealthDataLocator	This community does not maintain externally available location information about this patient and will respond with no data to a Patient Location Query transaction related to this patient.

The following example shows part of a response specifying no support for Health Data Locator:

```
    <subject typeCode="SUBJ">
        <registrationEvent classCode="REG" moodCode="EVN">
            <id nullFlavor="NA"/>
            <statusCode code="active"/>
            <subject1 typeCode="SBJ">
                … (details of the matching patient)
            </subject1>
            <custodian typeCode="CST">
                <assignedEntity classCode="ASSIGNED">
                    <id root="1.2.840.114350.1.13.99998.8734"/>
                    <code code="NotHealthDataLocator"
                        codeSystem="1.3.6.1.4.1.19376.1.2.27.2"/>
                </assignedEntity>
            </custodian>
        </registrationEvent>
    </subject>
```

3.55.4.2.2.6 Special handling for more attributes requested

9045 The Responding Gateway has the option of informing the Initiating Gateway when additional demographic attributes may result in a match. This would most often be used in cases where the security and privacy policies do not allow release of patient data unless and until there is a level of assurance that the same patient is referenced. In this case the Responding Gateway cannot return a matching patient or patients because the level of assurance is not great enough. If the
9050 Initiating Gateway were able to specify further demographic attributes the Responding Gateway might have greater assurance of the match and thus be able to return the match information.

To indicate this situation in its response the Responding Gateway codes a DetectedIssueEvent within the controlActProcess element, where the code in the actOrderRequired element references one of the coded elements described in Table 3.55.4.4.2-4. There may be as many
9055 triggerFor elements, each of them containing an ActOrderRequired element, as needed to code

the attributes which would increase the assurance of the match. The codeSystem for these code elements is 1.3.6.1.4.1.19376.1.2.27.1.
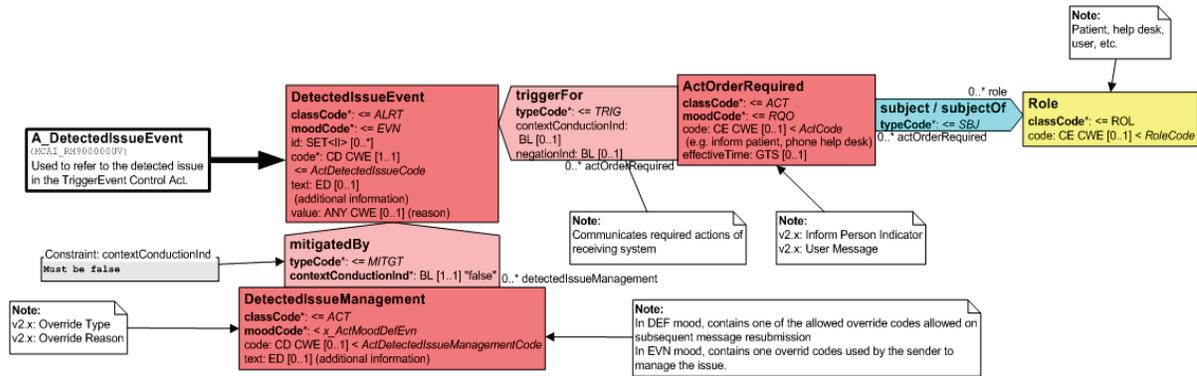

Figure 3.55.4.2.2-2: RMIM for DetectedIssueEvent

9060 **Table 3.55.4.4.2-4: Coded values for codeSystem=1.3.6.1.4.1.19376.1.2.27.1**

Value for code	Meaning of code
LivingSubjectAdministrativeGenderRequested	Requests the LivingSubjectAdministrativeGender attribute be specified
PatientAddressRequested	Requests the PatientAddress attribute be specified
PatientTelecomRequested	Requests the PatientTelecom attribute be specified
LivingSubjectBirthPlaceNameRequested	Requests the LivingSubjectBirthPlaceName attribute be specified
LivingSubjectBirthPlaceAddressRequested	Requests the LivingSubjectBirthPlaceAddress attribute be specified
MothersMaidenNameRequested	Requests the MothersMaidenName attribute be specified

The following example shows part of a response requesting the PatientAddress and PatientTelecom attributes.

```
<detectedIssueEvent classCode="ALRT" moodCode="EVN">
  <code code="ActAdministrativeDetectedIssueCode" codeSystem="2.16.840.1.113883.5.4"/>
9065  <triggerFor typeCode="TRIG">
    <actOrderRequired classCode="ACT" moodCode="RQO">
      <code code="PatientAddressRequested" codeSystem="1.3.6.1.4.1.19376.1.2.27.1"/>
    </actOrderRequired>
  </triggerFor>
9070  <triggerFor typeCode="TRIG">
    <actOrderRequired classCode="ACT" moodCode="RQO">
      <code code="PatientTelecomRequested" codeSystem="1.3.6.1.4.1.19376.1.2.27.1"/>
    </actOrderRequired>
  </triggerFor>
9075 </detectedIssueEvent>
```

3.55.4.2.2.7 Specify details about problems handling request

The Responding Gateway has the option of informing the Initiating Gateway with some detail regarding a problem handling the request.

The Responding Gateway may code a DetectedIssueEvent within the controlActProcess element,
9080 where the code in the detectedIssueManagement element references one of the coded elements

described in Table 3.55.4.4.2-5. The codeSystem for these code elements is
1.3.6.1.4.1.19376.1.2.27.3.

Table 3.55.4.4.2-5: Coded values for codeSystem=1.3.6.1.4.1.19376.1.2.27.3

Value for code	Meaning of code
ResponderBusy	The responder was not able to process the request because it is currently overloaded.
AnswerNotAvailable	The answer is not available. Human intervention may be needed.
InternalError	The responder was not able to respond due to an internal error or inconsistency.

9085   The following example shows part of a response specifying that the responder is busy.

```
<detectedIssueEvent classCode="ALRT" moodCode="EVN">
  <code code="ActAdministrativeDetectedIssueCode" codeSystem="2.16.840.1.113883.5.4"/>
  <mitigatedBy typeCode="MITGT">
    <detectedIssueManagement classCode="ACT" moodCode="EVN">
       <code code="ResponderBusy" codeSystem="1.3.6.1.4.1.19376.1.2.27.3"/>
    </detectedIssueManagement>
  </mitigatedBy>
</detectedIssueEvent>
```

3.55.4.2.3 Expected Actions

The Initiating Gateway shall accept a SOAP fault representing a transmission error. An internal error in the Responding Gateway is covered under Case 5. The Initiating Gateway shall act on a valid query response as described by the following 5 cases:

Case 1: The Responding Gateway finds exactly one patient record matching the criteria sent in
9100   the query parameters.

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

OK (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper)

One RegistrationEvent (and the associated Patient role, subject of that event) is returned from the patient information source for the patient record found. The community associated with the
9105   Initiating Gateway may use the patient demographics and identifiers to run an independent matching algorithm to ensure the quality of the match. If the Initiating Gateway is grouped with an XCA Initiating Gateway, it may use the designated patient identifier in a Cross Gateway Query to get information about records related to the patient. This grouped Initiating Gateway shall be able to handle situations where the homeCommunityId in the response is different than
9110   the original homeCommunityId used to identify the XCPD Responding Gateway. In particular, the Initiating Gateway should use the new homeCommunityId to look up a potentially different endpoint. The Initiating Gateway may also choose to cache the correlation for future use (see Section 3.55.4.2.3.1 for more information about caching).

Case 2: The Responding Gateway finds more than one patient close to matching the criteria sent in the query parameters and the policy allows returning multiple.

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

OK (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper)

One RegistrationEvent (and the associated Patient role, subject of that event) is returned for each patient record found. The community associated with the Initiating Gateway may run its own matching algorithm to select from the list of returned patients. If a correlation is found, the Responding Gateway may continue as if only one entry had been returned, see Case 1. If a correlation is still not clear it is expected that human intervention is required, depending on the policies of the Initiating Gateway's community.

Case 3: The Responding Gateway finds more than one patient close to matching the criteria sent in the query parameters but no matches close enough for the necessary assurance level and more attributes might allow the Responding Gateway to return a match.

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

OK (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper)

No RegistrationEvent is returned in the response, but the Responding Gateway provides a suggestion in terms of demographics that may help identify a match. The mechanism for specifying the suggestion is detailed in Section 3.55.4.2.2.6 for description of coding of the response. The Initiating Gateway may use this feedback to initiate a new Cross Gateway Patient Discovery request including the requested additional attributes.

Case 4: The Responding Gateway finds no patients anywhere close to matching the criteria sent in the query parameters.

AA (application accept) is returned in Acknowledgement.typeCode (transmission wrapper).

NF (data found, no errors) is returned in QueryAck.queryResponseCode (control act wrapper)

There is no RegistrationEvent returned in the response. The Initiating Gateway can assume this patient has no healthcare information held by the community represented by the Responding Gateway. This lack of correlation may be cached, see Section 3.55.4.2.3.1 for more information about caching.

Case 5: The Responding Gateway is unable to satisfy the request. This may be because the request came synchronously and an asynchronous request may be feasible, or because the Responding Gateway is overloaded with other requests and does not expect to answer for a significant period of time. It may also be that the Responding Gateway may need some manual configuration update to authorize responder or another error occurred while the Responding Gateway was processing the message payload.

AE (application error) is returned in Acknowledgement.typeCode (transmission wrapper).

AE (application error) is returned in QueryAck.queryResponseCode (control act wrapper)

9150   There is no RegistrationEvent returned in the response. See Section 3.55.4.2.2.7 for more information about coding errors for this case.

3.55.4.2.3.1 Caching (Informative)

This section presents some considerations regarding caching of information learned through the Cross Gateway Patient Discovery transaction. There are no requirements regarding caching of

9155   the information, as this is a complex issue and must be addressed as part of deployment. The caching resulting from receiving and responding to the query is not updating any local information but only saving a record in a cache if so desired.

Both the requesting and responding side of the Cross Gateway Patient Discovery transaction gain knowledge through this transaction. That knowledge may be used immediately, by sending a

9160   Cross Gateway Query transaction, or may be cached for use at some other time (or both). This section addresses caching considerations when the Cross Gateway Patient Discovery transaction is used in the Demographic Query and Feed mode. Other modes are a simplification of this mode with corresponding simplifications of the considerations presented.

The knowledge gained on both sides can be represented as a tuple:

9165   • LocalPid – Local patient identifier and demographics associated with that identifier

• ExternalCommunityId – The homeCommunityId of another community.

• ExternalPid – The patient identifier for the same patient as LocalPid within the community identified by ExternalCommunityId. This identifier also has associated demographics

9170   For the Initiating Gateway the ExternalPid may be null indicating that the community represented by ExternalCommunityId has no correlating patient identifier available.

The tuple represents a correlation, or lack thereof, of patients in a pair of communities. The validity of this correlation may degrade over time, as changes in demographics, merge/link events and new patient registrations affect the correlation.

9175   **Local changes in demographics, merge/link**

When a local change in demographics or a merge/link event affects the LocalPid, the community may initiate a Cross Gateway Patient Discovery request to validate the correlation.

External changes in demographics, merge/link

When an external change in demographics or merge/link event occurs, the external community

9180   may initiate a Cross Gateway Patient Discovery request which, when received, can be used to re-assess the correlation and adjust accordingly. Mutually agreed policies for use of the CorrelationTimeToLive SOAP header may enable greater assurance that changes are reflected when needed.

New patient registrations

9185 When the Initiating Gateway's community discovers the lack of correlation to its local patient (ExternalPid null) it may monitor incoming Cross Gateway Patient Discovery transactions in order to discover later if that patient has arrived in the Responding Gateway's community.

3.55.5 Security Considerations

No transaction specific security considerations.

9190 ### 3.55.5.1 Security Audit Considerations

The Cross Gateway Patient Discovery transaction is a Query Information event as defined in ITI TF-2a: 3.20.4.1.1.1-1.

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

3.55.5.1.1 Initiating Gateway audit message:

	Field Name	**Opt**	**Value Constraints**
Event AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-55", "IHE Transactions", "Cross Gateway Patient Discovery")
Source (Initiating Gateway) (1)			
Human Requestor (0..n)			
Destination (Responding Gateway) (1)			
Audit Source (Initiating Gateway) (1)			
Patient (0) No patient identifiers are included in this audit message.			
Query Parameters (1)			

9195 Where:

Source AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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*

9200

Destination AuditMessage/ ActiveParticipant	UserID	M	SOAP 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*

Query Parameters (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-55, "IHE Transactions", "Cross Gateway Patient Discovery")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	*U*	*not specialized*
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the QueryByParameter segment of the query, base64 encoded.
	ParticipantObjectDetail	M	The value of "ihe:homeCommunityID" as the value of the attribute type and the value of the homeCommunityID as the value of the attribute value.

3.55.5.1.2 Responding Gateway audit message:

	Field Name	**Opt**	**Value Constraints**
Event AuditMessage/ EventIdentification	EventID	M	EV(110112, DCM, "Query")
	EventActionCode	M	"E" (Execute)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-55", "IHE Transactions", "Cross Gateway Patient Discovery")
Source (Initiating Gateway) (1)			
Destination (Responding Gateway) (1)			

Audit Source (Responding Gateway) (1)
Patient (0..n) one for each patient whose demographic information was returned in the response.
Query Parameters (1)

9205 Where:

Source AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, 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	SOAP endpoint URI.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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*

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 in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

9210

Query Parameters (AuditMessage/ ParticipantObjectIde ntification)	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-55", "IHE Transactions", "Cross Gateway Patient Discovery")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	*U*	*not specialized*
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	M	the QueryByParameter segment of the query, base64 encoded.
	ParticipantObjectDetail	M	The value of "ihe:homeCommunityID" as the value of the attribute type and the value of the homeCommunityID as the value of the attribute value.

3.55.6 Protocol Requirements

The Cross Gateway Patient Discovery request and response will be transmitted using Synchronous or Asynchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V. If the Deferred Response Option is being used the request and response will be transmitted as described in Section 3.55.6.2.

The following WSDL naming conventions shall apply:

```
query message    -> "PRPA_IN201305UV02_Message"
```

The following WSDL snippet describes the type for this message:

```
      …
 <types>
<xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201305UV02.xsd"/>
<xsd:element name="PRPA_IN201305UV02"/>
</xsd:schema>
  </types>
…
The message is described by the following snippet:
      …
  <message name="PRPA_IN201305UV02_Message">
<part element="hl7:PRPA_IN201305UV02" name="Body"/>
  </message>
      …
```

3.55.6.1 Web Services Port Type and Binding Definitions

Responding Gateway:

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "RespondingGateway".

The following WSDL naming conventions shall apply:

```
wsdl:definitions/@name="RespondingGateway":
```

```
9245        ITI-55 query                  -> "PRPA_IN201305UV02_Message"
            ITI-55 response               -> "PRPA_IN201306UV02_Message"
            accept acknowledgement        -> "MCCI_IN000002UV01_Message"
            portType                      -> "RespondingGateway_PortType"
            ITI-55 operation              -> "RespondingGateway_PRPA_IN201305UV02"
9250        ITI-55 Deferred Response operation ->
                                  "RespondingGateway_Deferred_PRPA_IN201305UV02"
            SOAP 1.2 binding              -> "RespondingGateway_Binding_Soap12"
            SOAP 1.2 port                 -> "RespondingGateway_Port_Soap12"
```

9255 **Initiating Gateway:**

IHE-WSP201) The attribute /wsdl:definitions/@name SHALL be "InitiatingGateway".

The following WSDL naming conventions shall apply:
```
            wsdl:definitions/@name="InitiatingGateway":
            ITI-55 response               -> "PRPA_IN201306UV02_Message"
9260        accept acknowledgement        -> "MCCI_IN000002UV01_Message"
            portType                      -> "InitiatingGateway_PortType"
            ITI-55 Deferred Response operation ->
                                  "InitiatingGateway_Deferred_PRPA_IN201306UV02"
            SOAP 1.2 binding              -> "InitiatingGateway_Binding_Soap12"
9265        SOAP 1.2 port                 -> "InitiatingGateway_Port_Soap12"
```

The following WSDL snippets specify the Cross Gateway Patient Discovery Query Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

3.55.6.1.1 Port Type

9270

Responding Gateway:

```
  <portType name="RespondingGateway_PortType">
      <operation name="RespondingGateway_PRPA_IN201305UV02">
<input message="tns:PRPA_IN201305UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201305UV02:CrossGatewayPatientDiscovery"/>
<output message="tns:PRPA_IN201306UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201306UV02:CrossGatewayPatientDiscovery"/>
</operation>
<operation name="RespondingGateway_Deferred_PRPA_IN201305UV02">
<input message="tns:PRPA_IN201305UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201305UV02:Deferred:CrossGatewayPatientDiscovery"/>
<output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-org:v3:MCCI_IN000002UV01"/>
</operation>
</portType>
```

9285

Initiating Gateway:

9290

```
<portType name="InitiatingGatewayDeferredResponse_PortType">
        <operation name="InitiatingGateway_Deferred_PRPA_IN201306UV02">
                <input message="tns:PRPA_IN201306UV02_Message" wsaw:Action="urn:hl7-
org:v3:PRPA_IN201306UV02:Deferred:CrossGatewayPatientDiscovery"/>
                <output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
org:v3:MCCI_IN000002UV01"/>
        </operation>
</portType>
```

9295

3.55.6.1.2 Bindings

SOAP 1.2 binding:

9300 **Responding Gateway:**

```
…
  <binding name="RespondingGateway_Binding_Soap12" type="RespondingGateway_PortType">
    <wsoap12:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="RespondingGateway_PRPA_IN201305UV02">
      <wsoap12:operation soapActionRequired="false"/>
       <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </operation>
    <operation name="RespondingGateway_Deferred_PRPA_IN201305UV02">
        <wsoap12:operation soapActionRequired="false"/>
        <input>
        <wsoap12:body use="literal"/>
        </input>
        <output>
        <wsoap12:body use="literal"/>
        </output>
    </operation>
  </binding>
…
```

9305

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9325 **Initiating Gateway:**

```
…
  <binding name="InitiatingGatewayDeferredResponse_Binding"
type="tns:InitiatingGatewayDeferredResponse_PortType">
        <soap12:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
        <operation name="InitiatingGateway_Deferred_PRPA_IN201306UV02">
                <soap12:operation soapActionRequired="false"/>
                <input>
                        <soap12:body use="literal"/>
                </input>
                <output>
                        <soap12:body use="literal"/>
                </output>
        <operation>
</binding>
…
```

Informative WSDL for the Responding Gateway is available online on the IHE FTP site, see ITI
TF-2x: Appendix W.

3.55.6.2 Deferred Response Option

9345 The Deferred Response Message pattern is a message exchange pattern where the
request/response web service message exchange has been converted into two request/response
message exchange patterns, where the original request and response messages are used as the
request portion of each message and an application acknowledgement is the response. Figure
3.55.6.2-1 illustrates this pattern as it is used for the Cross Gateway Patient Discovery [ITI-55]
9350 transaction.
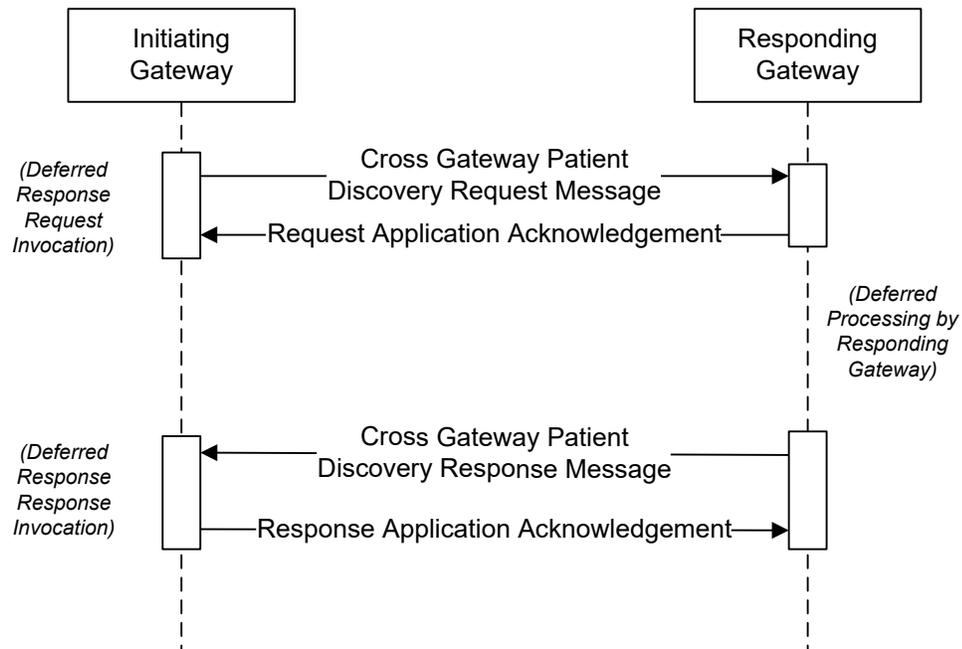
Figure 3.55.6.2-1: Deferred Response Message Pattern

Cross Gateway Patient Discovery Request Message

9355   The Initiating Gateway that supports the Deferred Response Option may request the use of Deferred Response message exchange by specifying the following in the Cross Gateway Patient Discovery Request Message:

- The WS-Addressing Action value shall be urn:hl7-org:v3:PRPA_IN201305UV02:Deferred: CrossGatewayPatientDiscovery

9360
- The responsePriorityCode element shall be set to a value of 'D' to represent the deferred processing mode.

- The respondTo element of the transmission wrapper, see the figure in Section 3.55.4.1.2.4, shall contain a telecom element with the Web Services Endpoint where the response shall be sent.

9365   Example of specifying the respondTo element:

```
<respondTo typeCode="RSP">
   <telecom value="service entry point url"
   <entityRsp classCode="ENT" determinerCode="INSTANCE" xsi:nil="true"/>
</respondTo>
```
9370

Cross Gateway Patient Discovery Request Application Acknowledgement Message

If the Responding Gateway supports the Deferred Response Option it shall respond with an HL7 V3 Accept Acknowledgement message (MCCI_IN000002UV01). The WS-Addressing Action value shall be urn:hl7-org:v3:MCCI_IN000002UV01.

9375 **Cross Gateway Patient Discovery Response Message**

The Responding Gateway will process the Cross Gateway Patient Discovery Request Message and generate a Cross Gateway Patient Discovery Response Message following all the applicable requirements for the transaction. If the Responding Gateway supports the Deferred Response Option, the Cross Gateway Patient Discovery Response Message will be sent as a new request as

9380 follows:

- The Responding Gateway shall direct the response message to the address specified in the respondTo element in the transmission wrapper.

- The WS-Addressing RelatesTo element of the response message shall be populated with the message identifier from the WS-Addressing MessageID element of the request

9385 message

- The WS-Addressing Action value shall be urn:hl7-org:v3:PRPA_IN201306UV02:Deferred:CrossGatewayPatientDiscovery

- Correlation with the request message is also supplied through the queryID element from the request message which shall be the same as the queryID element of the Response

9390 message.

Cross Gateway Patient Discovery Response Application Acknowledgement Message

The Initiating Gateway that supports the Deferred Response Option shall respond with an HL7 V3 application acknowledgement message (MCCI_IN000002UV01). The WS-Addressing Action value shall be urn:hl7-org:v3:MCCI_IN000002UV01.

9395

3.56 Reserved for Patient Location Query [ITI-56]

3.57 Reserved for Update Document Set [ITI-57]

3.58 Reserved for Provider Information Query [ITI-58]

9400 ## 3.59 Reserved for Provider Information Feed [ITI-59]

3.60 Retrieve Multiple Value Sets [ITI-60]

This section corresponds to transaction ITI-60 of the IHE IT Infrastructure Technical Framework. The Value Set Consumer and Value Set Repository Actors use transaction ITI-60.

3.60.1 Scope

9405 This transaction is used by the Value Set Consumer to retrieve Value Sets from the Value Set Repository.

3.60.2 Use case roles
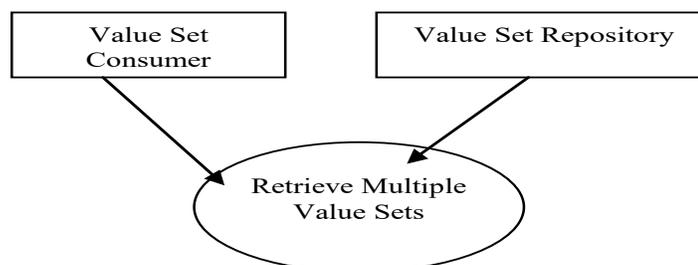
9410 **Figure 3.60.2-1: Use Case Roles**

Actors:

Actor: Value Set Consumer

Role: Requests all Value Sets that match request parameters

Actor: Value Set Repository

9415 **Role:** Provides matching Value Sets and associated metadata

3.60.3 Referenced Standards

The referenced standards are:

Table 3.60.3-1: Referenced Standards

| Appendix V	ITI TF-2x: Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use
HL7 v3 Data Type XML ITS	HL7 Version 3 Standard: XML Implementation Technology Specifications – Data Types, R1
HTTP 1.1	IETF RFC2616: Hypertext Transfer Protocol – HTTP 1.1
POSIX 1003.2	IEEE Std 1003.2 IEEE Standard for Information Technology — Portable Operating System Interface (POSIX®) — Part 2: Shell and Utilities — Amendment 1: Batch Environment - Description

9420 **3.60.4 Interaction Diagram**
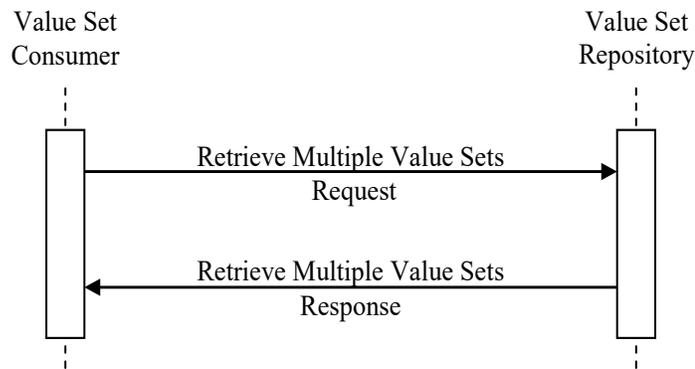
Figure 3.60.4-1: Interaction Diagram

3.60.4.1 Retrieve Multiple Value Sets Request

9425 **3.60.4.1.1 Trigger Events**

The Value Set Consumer wants to retrieve value sets and has one or more element values to be matched in the metadata that describes value sets. This could be from pre-configuration or user input. The value sets that match these element values are needed for processing by the Value Set Consumer. The Value Set Consumer sends a Retrieve Multiple Value Sets Request to the Value

9430 Set Repository. Table 3.60.4.1.1-1 summarizes the metadata elements. See the schema for precise encoding details.

Table 3.60.4.1.1-1: Metadata Summary

Metadata Element	Description	Mandatory within Metadata returned	Usable as Selection Criterion
id	This is the unique identifier of the value set	Mandatory	Y
displayName	This is the name of the value set	Mandatory	Y

Metadata Element	Description	Mandatory within Metadata returned	Usable as Selection Criterion
Source	This is the source of the value set, identifying the originator or publisher of the information	Mandatory	Y
Purpose	Brief description about the general purpose of the value set	Optional	Y
Definition	A text definition describing how concepts in the value set were selected	Optional	Y
Source URI	Most sources also have a URL or document URI that provides further details regarding the value set.	Optional	N
Version	A string identifying the specific version of the value set.	Mandatory	N
Status	Active, Inactive, local extensions	Mandatory	N
Type	This describes the type of the value set. It shall be: • Intensional, • Extensional, or • Expanded Note: This is the type of the value set in the repository. The ConceptList that will also be returned is the current expansion of the value set.	Mandatory	N
Binding	Shall be "Static" or "Dynamic"	Optional	N
Effective Date	The date when the value set is expected to be effective	Optional	Y
Expiration Date	The date when the value set is no longer expected to be used	Optional	Y
Creation Date	The date of creation of the value set	Optional	Y
Revision Date	The date of revision of the value set	Optional	Y
Group	The identifiers and keywords of the groups that include this value set. A group may also have an OID assigned.	Optional	Y

3.60.4.1.2 Message Semantics

9435   The Retrieve Multiple Value Sets Request shall specify retrieval selection parameters as shown in the Table 3.60.4.1.2-1. It requests retrieval of all concept lists that have metadata matching the parameters used. At least one request parameter shall be provided.

Table 3.60.4.1.2-1: The Request Parameters in the RetrieveMultipleValueSets Request

Parameter	Parameter Format	Metadata Element	Match Type	Match Rules	Note
id	OID	id	OID	equals	
DisplayNameContains	string	Name	Regex	regex	POSIX rules
SourceContains	string	Source	Regex	regex	POSIX rules
PurposeContains	string	Purpose	Regex	regex	POSIX rules
DefinitionContains	string	Definition	Regex	regex	POSIX rules
GroupContains	string	Group	Regex	regex	POSIX rules
GroupOID	OID	Group	OID	equals	Equality match for OID attribute of a Group element
EffectiveDateBefore	http-date	EffectiveDate	date	Before or equal	Date comparison to the day
EffectiveDateAfter	http-date	EffectiveDate	date	Equal or after	Date comparison to the day
ExpirationDateBefore	http-date	ExpirationDate	date	Before or equal	Date comparison to the day
ExpirationDateAfter	http-date	ExpirationDate	date	Equal or after	Date comparison to the day
CreationDateBefore	http-date	CreationDate	date	Before or equal	Date comparison to the day
CreationDateAfter	http-date	CreationDate	date	Equal or after	Date comparison to the day
RevisionDateBefore	http-date	RevisionDate	date	Before or equal	Date comparison to the day
RevisionDateAfter	http-date	RevisionDate	date	Equal or after	Date comparison to the day
Format	String	n/a	n/a	n/a	This specifies the format for the returned information. Shall be "CE-List" if present.

9440 ### 3.60.4.1.3 Expected Actions

The Value Set Repository shall perform matching in accordance with the rules in Table 3.60.4.1.2-1.

- Regex matches shall compare the contents of the referenced metadata field with the regex using the POSIX matching rules. If the regex matches the field, the value set
9445 matches.

- OID matching compares only for equal OIDs, ignoring leading zeroes.

- Date comparisons convert the argument into a date, and compare it with the dates in the metadata using a date comparison. Equality means the same day.

Any value set that matches all of the request parameters shall be included in the response.

9450   Note: Multiple queries will sometimes be needed. Rather than specify a complex query mechanism, the Retrieve Multiple Value Sets request expects the client or user to locally eliminate any extra value sets and make additional queries. Value sets are relatively small and compress very well, so these extras are not a significant communications burden. Performing the final steps of selecting the value sets based on having the full metadata present locally allows a much richer and potentially interactive selection process. It also allows a simpler and

9455   more robust server.

3.60.4.2 Retrieve Multiple Value Sets Response

3.60.4.2.1 Trigger Events

This message will be triggered by completion of matching for a Retrieve Multiple Value Sets Request Message.

9460   **3.60.4.2.2 Message Semantics**

The response shall be a Retrieve Multiple Value Sets Response as specified in the XML schema defining RetrieveMultipleValueSetsResponse which can be accessed on the IHE FTP site, see ITI TF-2x: Appendix W. The RetrieveMultipleValueSetsResponse element shall have one DescribedValueSet element for each matching value set found. If no matching elements are

9465   found, it shall be empty.

Each DescribedValueSet element contains:

- **An id** attribute, a mandatory OID, the OID for this value set

- **A displayName** attribute, a mandatory string, the name of this value set

- **Source**, an optional string, the source organization for this value set

9470   • **SourceURI**, an optional URI, a URI providing more description of this value set,

- **Purpose**, an optional string, a description of the intended use of this value set

- **Definition**, an optional string, a definition of the value set provided by the source

- **A version** attribute, a mandatory string, a version in the format used by the source,

- **Status**, an optional string, the status at time of retrieval (e.g., Active or Inactive)

9475   • **Type,** a mandatory string that indicates whether this is an intensional, extensional, or expanded value set.

- **Binding,** an optional string, either static or dynamic**.**

- **EffectiveDate**, an optional XML-date, the initial effective date for this value set

- **ExpirationDate**, an optional XML-date, the intended expiration date for this value set

9480   • **CreationDate**, an optional XML-date, the creation date of this value set,

- **RevisionDate**, an optional XML-date, the revision date of this value set,

- Zero or more **Group** elements, where each **Group** element has

- • an optional **id** attribute containing the OID for the group.

- • An optional **displayName** attribute**,** containing the name for the group,

9485
- • An optional **sourceOrganization** attribute**,** containing the name of the organization that defined the group.

- • Zero or more **Keyword** elements that contain keywords associated with the group.

- • One **ConceptList**, that contains

- • One or more **Concept**, encoded using the HL7 CE datatype. These are the codes that
9490 are members of the expanded form of the value set.

- • With an optional attribute **xml:lang** to indicate the language for the displayname for these concepts.

The ConceptList element and structure is the same in both the ITI-48 and ITI-60 transactions. The Identifier OID in the ITI-60 response is the OID used in the ITI-48 transaction when the
9495 value set is an expanded value set. It will not match in other cases.

A sample RetrieveMultipleValueSetsResponse is shown below:

```
<?xml version="1.0" encoding="UTF-8"?>
<RetrieveMultipleValueSetsResponse xmlns="urn:ihe:iti:svs:2008"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:ihe:iti:svs:2008:SVS.xsd">
    <DescribedValueSet id="1.2.3" displayName="placeholder" version="version1">
          <ConceptList xml:lang="en-US">
              <Concept code="code1" codeSystem="2.3.4"
codeSystemName="codeSystemName1" codeSystemVersion="codeSystemVersion1"
displayName="displayName1">
              </Concept>
              <Concept code="code7" codeSystem="2.3.4"
codeSystemName="codeSystemName1" codeSystemVersion="codeSystemVersion1"
displayName="displayName7">
              </Concept>
        </ConceptList>
        <Source>Codingsource</Source>
        <SourceURI>http://www.codingsource.com/placeholder</SourceURI>
        <Purpose>Purpose0</Purpose>
        <Definition>Definition0</Definition>
        <Type>Expanded</Type>
        <Binding>Static</Binding>
        <Status>Status0</Status>
        <EffectiveDate>2006-05-04</EffectiveDate>
        <ExpirationDate>2011-09-04</ExpirationDate>
        <CreationDate>2006-05-04</CreationDate>
        <RevisionDate>2006-05-04</RevisionDate>
          <Group id="2.4.5" sourceOrganization="sourceOrganization1"
displayName="displayName15">
              <Keyword>Keyword0</Keyword>
              <Keyword>Keyword1</Keyword>
          </Group>
          <Group id="2.4.54" sourceOrganization="sourceOrganization3"
displayName="displayName17">
```

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```
                <Keyword>Keyword2</Keyword>
                <Keyword>Keyword3</Keyword>
            </Group>
        </DescribedValueSet>
9535 </RetrieveMultipleValueSetsResponse>
```

3.60.5 Protocol Requirements

The protocol for the Retrieve Value Set transaction describes two bindings. The first is based on SOAP 1.2, and the second is an HTTP binding. The relevant XML namespace definitions can be seen in Table 3.48.5-1 WSDL Namespace Definitions.

9540   **Table 3.60.5-1: WSDL Namespace Definitions**

soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2006/05/addressing/wsdl/
xsd	http://www.w3.org/2001/XMLSchema
ihe	urn:ihe:iti:svs:2008

3.60.5.1 SOAP Binding

Value Set Consumers which support the SOAP Binding Option shall follow the rules for Web Services transactions outlined in ITI TF-2x: Appendix V. These are the requirements for the RetrieveMultipleValueSets transaction presented in the order in which they would appear in the
9545 WSDL definition:

The following types shall be imported (xsd:import) in the /definitions/types section:

namespace="`urn:ihe:iti:svs:2008`", schema="SVS.xsd"

The `/definitions/message/part/@element` attribute of the Retrieve Value Set Request message shall be defined as "`ihe:RetrieveMultipleValueSetsRequest`"

9550 The `/definitions/message/part/@element` attribute of the Retrieve Value Set Response message shall be defined as "`ihe:RetrieveMultipleValueSetsResponse`"

The `/definitions/portType/operation/input/@wsaw:Action` attribute for the Retrieve Multiple Value Sets Request message shall be defined as "`urn:ihe:iti:2010:RetrieveMultipleValueSets`"

9555 The `/definitions/portType/operation/output/@wsaw:Action` attribute for the Retrieve Value Set Response message shall be defined as "`urn:ihe:iti:2010:RetrieveMultipleValueSetsResponse`"

The `/definitions/binding/operation/soap12:operation/@soapActionRequi`
9560 `red` attribute shall be defined as "`false`"

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability.

Within the request message payload the
`<ihe:RetrieveMultipleValueSetsRequest/>` element is defined as:

9565
- A optional `/ihe:RetrieveMultipleValueSetsRequest@id` element that contains the ID of the requested Value Set within the Value Set Repository. The Value Set ID shall be formatted as an ISO OID.

- An optional `/ihe:RetrieveMultipleValueSetsRequest@DisplayNameContains` element
9570

- An optional `/ihe:RetrieveMultipleValueSetsRequest@SourceContains` element

- An optional `/ihe:RetrieveMultipleValueSetsRequest@PurposeContains` element

9575
- An optional `/ihe:RetrieveMultipleValueSetsRequest@DefinitionContains` element

- An optional `/ihe:RetrieveMultipleValueSetsRequest@GroupContains` element

9580
- An optional `/ihe:RetrieveMultipleValueSetsRequest@GroupOID` element

- An optional `/ihe:RetrieveMultipleValueSetsRequest@EffectiveDateBefore` element

9585
- An optional `/ihe:RetrieveMultipleValueSetsRequest@EffectiveDateAfter` element

- An optional `/ihe:RetrieveMultipleValueSetsRequest@ExpirationDateBefore` element
9590

- An optional `/ihe:RetrieveMultipleValueSetsRequest@ExpirationDateAfter` element

9595
- An optional `/ihe:RetrieveMultipleValueSetsRequest@CreationDateBefore` element

- An optional `/ihe:RetrieveMultipleValueSetsRequest@CreationDateAfter` element

9600
- An optional
  `/ihe:RetrieveMultipleValueSetsRequest@RevisionDateBefore`
  element

- An optional
  `/ihe:RetrieveMultipleValueSetsRequest@RevisionDateAfter`
9605   element

Value Set Repositories shall include within the response message payload for the SOAP Binding Option the `<ihe:RetrieveMultipleValueSetsResponse/>` element which is described above in Section 3.60.4.2.2.

3.60.5.2 HTTP Binding

9610   Value Set Consumers which support the HTTP Binding Option shall use the GET method as defined in IETF RFC2616 for the Retrieve Value Set Request. Each parameter to be used for selection shall be encoded as an HTTP Get parameter.

A sample URL for the HTTP binding for a query to retrieve all value sets for a reporting purpose, with either "stroke" or "JCAHO" in the value set name looks as follows:

9615   `https://example.com/RetrieveMultipleValueSets?DisplayNameContains="stroke|JCAHO"&PurposeContains="report"`

Value Set Repositories shall format the response to the HTTP GET operation as an HTTP response message as defined in IETF RFC2616.

The Content-Type field of the HTTP header shall be "text/xml" (see Section 14.4 of IETF
9620   RFC2616).

The content of the HTTP response message shall be an XML encoded RetrieveMultipleValueSetsResponse, as described in Section 3.60.4.2.2.

The Value Set Repository shall return an error code in case there are invalid request parameters. It shall return an HTTP status code of 404, with an HTTP Warning header containing warn-code of 111, and warn-text of "INV: Invalid search parameters". See Sections 10.4.5 and 14.46 of
9625   IETF RFC2616 for more information. A search with valid request parameters that finds no matching value sets is not an error. It will return an empty QueryRetrievedValueSets

3.60.6 Security Requirements

The value sets do not contain personal information. In some cases, the value sets are created by
9630   standards organizations with the intention that they be or publicly shared. In other cases, there may be licensing or other proprietary restrictions on their disclosure. These licenses or restrictions are at the organizational level, not at the level of individual users. This greatly reduces the security needs and eliminates privacy concerns.

For further security considerations please consult ITI TF-1: Appendix G.

9635   Audit trails shall be configurable to record access to a selected list of Value Sets. In most cases, there is no need to audit the value set request activity, but there may be some exceptional cases

where auditing will be needed. See Section 3.48.6.1 for audit record recommendations in those cases.

This profile does not attempt to establish rules for managing security on proprietary value sets with licensing or access restrictions.

3.61 Register On-Demand Document Entry [ITI-61]

This section corresponds to Transaction [ITI-61] of the IHE ITI Technical Framework. Transaction [ITI-61] is used by the On-Demand Document Source and Document Registry Actors.

3.61.1 Scope

The Register On-Demand Document Entry transaction passes a Document Submission Request (see ITI TF-3: 4.2.1.5) from an On-Demand Document Source to a Document Registry Actor. The Document Submission Request for this transaction contains metadata describing one or more On-Demand DocumentEntry objects and, optionally, Folders and Associations.

3.61.2 Use Case Roles
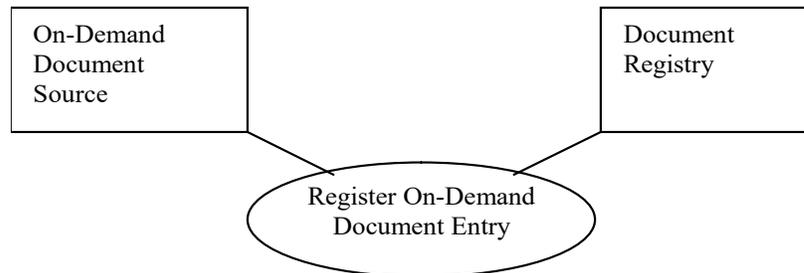
Actor: On-Demand Document Source

Role: A Provider of On-Demand Documents that registers a patient-specific on-demand document to the Document Registry.

Actor: Document Registry

**Role:** A document indexing system that receives and stores metadata about available on-demand documents.

3.61.3 Referenced Standard

ebRIM	OASIS/ebXML Registry Information Model v3.0
	This model defines the types of metadata and content that can be stored in an ebXML Registry, a basis for and subset of XDS metadata.
ebRS	OASIS/ebXML Registry Services Specifications v3.0
	This defines the services and protocols for an ebXML Registry, used as the basis for the XDS Registry
HL7V2	HL7 Version 2.5

| See ITI TF 2x: Appendix V for other referenced standards for SOAP encoding. |
| See ITI TF 3: 4.2 for other referenced standards for metadata element encoding. |

9660 ## 3.61.4 Interaction Diagram
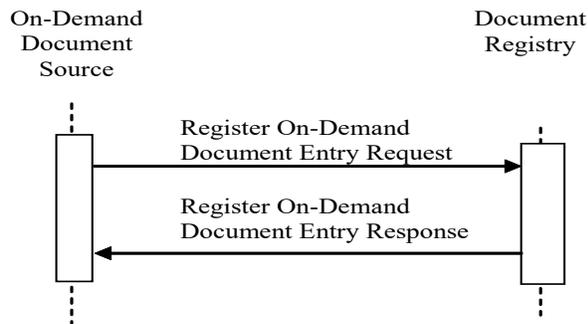
3.61.4.1 Register On-Demand Document Entry Request

The Register On-Demand Document Entry Request message is used to register metadata that can be used to request an on-demand document. An on-demand document is one which collects the
9665 latest, most recent available information at the time of retrieval. For more information about the On-Demand DocumentEntry specified in the request message see ITI TF-3: 4.1.1.

The On-Demand Document Source sends metadata to the Document Registry. The metadata contains one or more patient-specific On-Demand DocumentEntry objects and, optionally, Folders and Associations.

9670 ### 3.61.4.1.1 Trigger Events

The Register On-Demand Document Entry Request message is triggered when the On-Demand Document Source chooses to make available an on-demand document for a particular patient.

3.61.4.1.2 Message Semantics

The Register On-Demand Document Entry Request message shall use SOAP 1.2 and Simple
9675 SOAP (See ITI TF-2x: V.8.1). Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

The Register On-Demand Document Entry Request message shall contain a Submission Request, as defined in ITI TF-3: 4.1.4 except that it shall include at least one On-Demand DocumentEntry. All DocumentEntry objects in this Submission Request shall be On-Demand DocumentEntry
9680 objects and, therefore, will not be Stable DocumentEntry objects.

This transaction imposes no restrictions on the use of Folders or Associations. In particular, workflows which replace a Stable DocumentEntry with an On-Demand DocumentEntry, add an

On-Demand DocumentEntry to a Folder, or replace an On-Demand DocumentEntry with a new On-Demand DocumentEntry are all valid.

9685   Note: Because a Stable DocumentEntry cannot be submitted in this transaction, Associations which require the simultaneous submission of a Stable DocumentEntry cannot be included in this transaction. For example, workflows which replace an On-Demand DocumentEntry with a Stable DocumentEntry are not allowed.

See ITI TF-3: 4.2.1.4 for a description of the ebRS/ebRIM representation of a Submission Request. The metadata requirements for this Submission Request are defined in ITI TF-3: 4.3.1.
9690   In its use of metadata, the On-Demand DocumentEntry has the same requirements as a Stable DocumentEntry, except for the following:

- creationTime – Not Applicable; shall not be specified in a Register On-Demand Document Entry Request.

- hash – Not Applicable; shall not be specified in a Register On-Demand Document Entry
9695   Request.

- legalAuthenticator – Recommend this not be specified as having no clear meaning in the context of an On-Demand DocumentEntry.

- repositoryUniqueId – The globally unique immutable identifier of the On-Demand Document Source which provides an On-Demand Document corresponding to this On-
9700   Demand DocumentEntry. This unique identifier for the On-Demand Document Source may be used to identify and connect to the specific On-Demand Document Source where a current instance of the on-demand document may be retrieved.

- size – Not Applicable; shall not be specified in a Register On-Demand Document Entry Request.

9705 - serviceStartTime and serviceStopTime - For On-Demand DocumentEntry objects this attribute represents the earliest time(serviceStartTime)/most recent time(serviceStopTime) health service was rendered for which data is available on-demand. For some On-Demand Document Sources this attribute is not applicable and so would not be present.

9710 - uniqueId – The globally unique identifier assigned by the On-Demand Document Source to this On-Demand DocumentEntry. It is used in the Retrieve Document Set [ITI-43] transaction to identify the correct On-Demand Document to access. The use of uniqueId in On-Demand DocumentEntry objects is different from Stable DocumentEntry objects as this value will never represent an actual document. See ITI TF-3: 4.1.1 for more details
9715   regarding use of uniqueId by On-Demand DocumentEntry objects.

A full example of document metadata submission is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

XML namespace prefixes used in text and in examples below are for informative purposes only and are documented in ITI TF-2x: Appendix V, Table 2.4-1.

9720   The requirements for the request message are:

- the <wsa:Action> SOAP element shall contain the value
  urn:ihe:iti:2010:RegisterOnDemandDocumentEntry

- the <soap12:Body> shall contain one <lcm:SubmitObjectsRequest> element representing
  the Submission Request (see ITI TF-3: 4.2.1.4 for details of expressing a Submission
9725   Request).

A full XML Schema Document for the XDS types is available online on the IHE FTP site, see
ITI TF-2x: Appendix W.

Below is an example of the SOAP Body for a Register On-Demand Document Entry Request
message:

9730
```
<soap12:Body>
    <lcm:SubmitObjectsRequest>
        <!-- Submission Request contents – See ITI TF-3: 4.2.1.4 -->
        <rim:RegistryObjectList>
9735
         <!-- Registry Metadata goes here -->

        </rim:RegistryObjectList>
    </lcm:SubmitObjectsRequest>
9740 </soap12:Body>
```

If the On-Demand Document Source supports the Asynchronous Web Services Exchange
Option, it shall be able to generate an Asynchronous Web Services request as defined in ITI TF-
2x: Appendix V.5.

If the On-Demand Document Source supports the Basic Patient Privacy Enforcement Option, it
9745   shall comply with the requirements as described in ITI TF-1: 10.2.9.

3.61.4.1.3 Expected Actions

Upon receipt of a Register On-Demand Document Entry Request message, the Document
Registry shall:

- Perform metadata validations

9750   - Store all IHE-defined metadata attributes received so that they are available to return in
  responses to future queries.

- Return a response message giving the status of the operation.

If the Document Registry rejects the metadata, it shall:

- Return an error including at least one error message in the response. For a complete list
9755   of applicable codes, refer to ITI TF-3: Table 4.2.4.1-2.

- Roll back any changes made.

The Document Registry shall comply with all of the requirements specified in Sections
3.42.4.1.3.1 through 3.42.4.1.3.7 except for Section 3.42.4.1.3.3.1 which describes the validation
of DocumentEntry.uniqueId. In terms of this metadata attribute, the Document Registry shall
9760   reject the message and return an error if the uniqueId attribute matches the uniqueId attribute of a

Stable DocumentEntry currently within the Document Registry. If the uniqueId attribute matches the uniqueId attribute of an On-Demand DocumentEntry currently within the Document Registry the Document Registry shall accept the transaction and thereby create a new On-Demand DocumentEntry with the same uniqueId.

3.61.4.2 Register On-Demand Document Entry Response

9765

The Document Registry sends the result of processing the On-Demand DocumentEntry metadata to the On-Demand Document Source.

3.61.4.2.1 Trigger Events

9770

The Document Registry finishes processing a Register On-Demand Document Entry Request message and shall return a Register On-Demand Document Entry Response message.

3.61.4.2.2 Message Semantics

The Register On-Demand Document Entry Response message shall use SOAP 1.2 and Simple SOAP (See ITI TF-2x: V.8.1). Implementors of this transaction shall comply with all requirements described in: ITI TF-2x: Appendix V: Web Services for IHE Transactions.

9775

The Register On-Demand Document Entry Response message shall carry the status of the requested operation. The response message may carry warning messages. If the requested operation fails, the response message shall carry at least one error message. The conditions of failure and possible warning and error messages are given in the ebRS standard and detailed in ITI TF-3: 4.2.4 Error Reporting. This transaction does not support a partial success response.

9780

If creationTime, hash or size metadata attributes are received in a Register On-Demand Document Entry Request message, the Document Registry shall return an XDSRegistryMetadataError.

XML namespace prefixes used in text and in examples below are for informational purposes only and are documented in ITI TF-2x: Appendix V, Table 2.4-1.

9785

The requirements for the response message are:

- the <wsa:Action> soap header shall contain the value
  urn:ihe:iti:2010:RegisterOnDemandDocumentResponse

- the <soap12:Body> soap element shall contain one <rs:RegistryResponse> element

See ITI TF-3: 4.2.4 for examples of response messages.

9790

If the Document Registry supports the Asynchronous Web Services Exchange Option and it receives an Asynchronous Web Services request, it shall respond as defined in ITI TF-2x: Appendix V.5.

3.61.4.2.3 Expected Actions

9795 The On-Demand Document Source now knows that the transaction succeeded/failed and can continue. The metadata added to the Document Registry as a result of this transaction is now available for discovery.

3.61.7 Security Considerations

Relevant XDS Affinity Domain Security background is discussed in the XDS Security Considerations Section (see ITI TF-1: 10.7).

9800 ### 3.61.7.1 Audit Record Considerations

The Register On-Demand Document Entry transaction is PHI-Export event, as defined in ITI TF-2a: Table 3.20.4.1.1.1-1 with the following exceptions.

3.61.7.1.1 On-Demand Document Source audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"R" (Read)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-61", "IHE Transactions", "Register On-Demand Document Entry")
Source (On-Demand Document Source) (1)			
Human Requestor (0..1)			
Destination (Document Registry) (1)			
Audit Source (On-Demand Document Source) (1)			
Patient (1)			
SubmissionSet (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, not specialized.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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.

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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	M	"true"

	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	SOAP 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/** **AuditSourceIdentificati** **on**	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AuditMessage/** **ParticipantObjectIde** **ntification)**	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 in HL7 CX format..
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

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Submission **Set** **(AuditMessage/** **ParticipantObjectIde** **ntification)**	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	*U*	*not specialized*

3.61.7.1.2 Document Registry audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/** **EventIdentification**	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (Create)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-61", "IHE Transactions", "Register On-Demand Document Entry")
Source (On-Demand Document Source) (1)			
Human Requestor (0..1)			
Destination (Document Registry) (1)			
Audit Source (Document Registry) (1)			
Patient (1)			
SubmissionSet (1)			

Where:

	Field Name	Opt	Value Constraints
Source **AuditMessage/** **ActiveParticipant**	UserID	M	If Asynchronous Web Services Exchange is being used, the content of the <wsa:ReplyTo/> element. Otherwise, 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.

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	Field Name	Opt	Value Constraints
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	M	"true"
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	*U*	*not specialized*
	NetworkAccessPointID	*U*	*not specialized*

	Field Name	Opt	Value Constraints
Destination **AuditMessage/** **ActiveParticipant**	UserID	M	SOAP endpoint URI
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	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*

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 in HL7 CX format..
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	U	*not specialized*

9820

Submission Set (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"20" (job)
	ParticipantObjectDataLifeCycle	U	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("urn:uuid:a54d6aa5-d40d-43f9-88c5-b4633d873bdd", "IHE XDS Metadata", "submission set classificationNode")
	ParticipantObjectSensitivity	U	*not specialized*
	ParticipantObjectID	M	The submissionSet unique ID
	ParticipantObjectName	U	*not specialized*
	ParticipantObjectQuery	U	*not specialized*
	ParticipantObjectDetail	U	*not specialized*

3.62 Reserved for Remove Metadata [ITI-62]

3.63 Reserved for Cross Gateway Fetch [ITI-63]

3.64 Reserved for Notify XAP-PID Link Change [ITI-64]