Integrating the Healthcare Enterprise

IT Infrastructure Technical Framework

Volume 2b (ITI TF-2b) Transactions Part B – Sections 3.29 – 3.51

Revision 8.0 – Final Text

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Contents

1 Introduction

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 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.

The approach employed in the IHE initiative is to support the use of existing standards, e.g., HL7, ASTM, DICOM, 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, 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 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 (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), 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.

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. 8.0 for Final Text, specifies the IHE transactions defined and implemented as of August 2011. The latest version of the document is always available via the Internet at http://www.ihe.net/Technical_Framework.

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-2a: 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:

- 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

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

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 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 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 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: 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, 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 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 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.

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 www.ihe.net/iti/iticomments.cfm or by sending an email to the co-chairs and secretary of the IT Infrastructure domain committees at iti@ihe.net.

1.7 Copyright Permission

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.

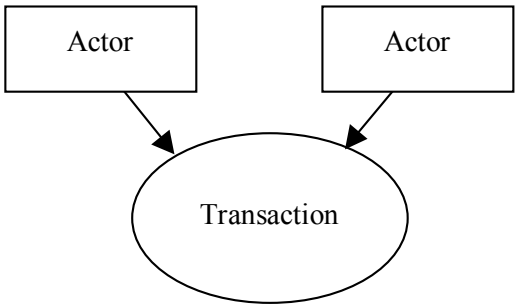
2.1 The Generic IHE Transaction Model

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:

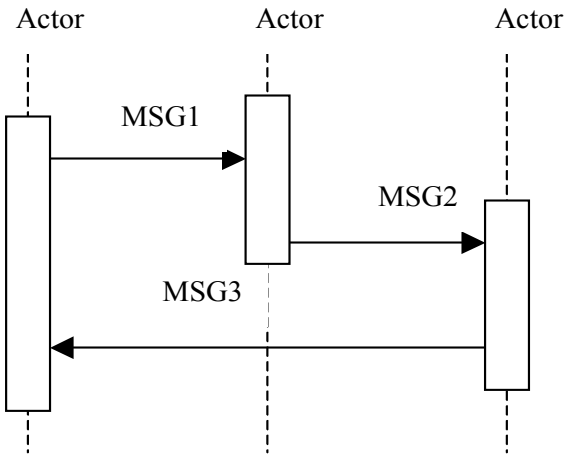
Scope: a brief description of the transaction.

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.

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:



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 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

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 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

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

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 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 and also information on persons related to this patient, such as primary caregiver, family doctor, guarantor, next of kin.

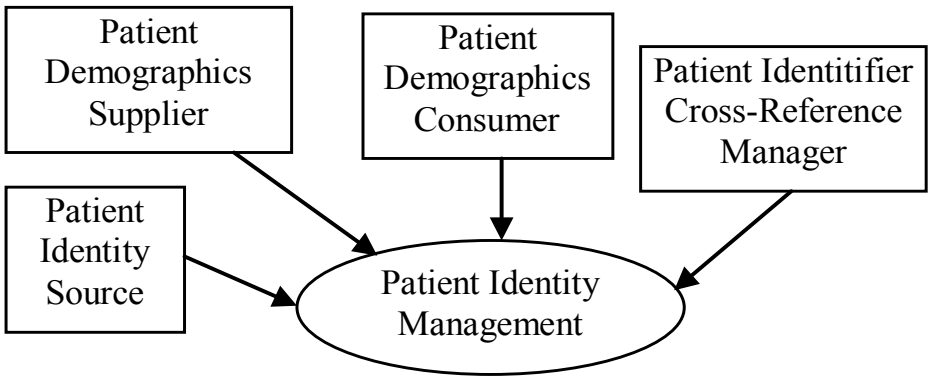
The transaction contains events for creating, updating, merging, linking and unlinking patients.

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).

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



Actor: Patient Demographics Supplier

Role: Adds and modifies patient demographics.

Actor: Patient Demographics Consumer

Role: Receives patient demographics.

Actor: Patient Identity Source

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

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 extensions of this profile. Any implementation framework will mandate both actors to support the same option. See 3.30.4.1 and 3.30.4.2.

Patient Identity Source and Patient Identity Cross-Reference Manager actors may supports the Pediatric Demographics option. See 3.30.4.3.

3.30.4.1 Required message subset with option "Merge"

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

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 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-Reference Manager.

3.30.5 Common HL7 Message Segments

This section describes the common HL7 message segments used in Transaction 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

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	SI	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
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	X	[0..0]	0155	00015	Accept Acknowledgement Type
16	2	ID	X	[0..0]	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	[1..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

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 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 volume 2x: Appendix C.

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

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 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), not supported.

MSH-16 Application Acknowledgment Type (ID), not supported.

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 0208-1990).

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 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 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.

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

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:

- 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 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.

National extensions of this profile 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 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.

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 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
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

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
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	O	[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	C	[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
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.

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).

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 at the end of this supplement, subfields CX-1 "ID number", CX-4 "Assigning authority", and CX-5 "Identifier Type Code" are required for each identifier.

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.14.5).

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

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.
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.

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:

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:

- 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.
- 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 (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	

PID-10 – Race (CE), optional: This field may be further constrained in national extensions of this PAM profile. For instance, it will be required if available (usage code RE) in the US extension, but will not be supported (usage code X) in the French extension.

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

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.

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): Optional.

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. 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. Additional requirements for the presence of value in these fields may be documented in national extensions of this profile.

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 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.

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

Condition predicate:

- This field is required in the Patient Discharge message of transaction ITI-31, in the case when the encounter is terminated by the patient's death. It provides the date/time of the patient's death.
- In all other messages, it is optional.

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

Condition predicate:

- This field is required to be populated with value "Y" whenever PID-29 is populated.

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: 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 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: 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:

User-defined Table 0445 - Identity Reliability Code

Value	Description	Comment (added by IHE for this profile)
US	Unknown/Default Social Security Number	
UD	Unknown/Default Date of Birth	
UA	Unknown/Default Address	
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: 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.

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:

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:

- 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).

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.

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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	XCN	O	[0..*]	0010	00147	Admitting Doctor
18	2	IS	O	[0..1]	0018	00148	Patient Type
19	250	CX	O	[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

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	ELEMENT NAME
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	O	[0..1]	0326	01226	Visit Indicator
52	250	XCN	X	[0..*]	0010	01274	Other Healthcare Provider

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).
- 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.

User-defined Table 0004 - Patient Class

Value	Description	Comment
E	Emergency	
I	Inpatient	
O	Outpatient	
P	Preadmit	
R	Recurring patient	
B	Obstetrics	
C	Commercial Account	

Value	Description	Comment
N	Not Applicable	
U	Unknown	

National extensions of this 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.

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.
  - 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.
- 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.

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 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 transaction ITI-31 (messages A09, A10, A32, A33).

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

Additional requirements for the presence of values in these fields may be documented in national extensions of this profile.

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

Condition predicate:

- This field is required in the Pending Transfer (A15) and Cancel Pending Transfer (A26) 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 the discharge (end of the encounter).

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

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM #	ELEMENT NAME
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
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.

ROL-2 – Action Code (ID), required

685 **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	

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

690 ### 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 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	R	[1..1]	0125	00570	Value Type
3	250	CE	R	[1..1]		00571	Observation Identifier
4	20	ST	O	[0..1]		00572	Observation Sub-ID
5	99999	Varies	R	[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), required.

This field contains the type of observation.

Example: “NM” for a numeric observation such as patient weight or patient height.

OBX-3 Observation Identifier (CE), required

The usage of LOINC® vocabulary is strongly recommended. Details of this free vocabulary can be 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`

OBX-5 Observation Value (Varies), required.

This field contains the value of the observation itself.

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

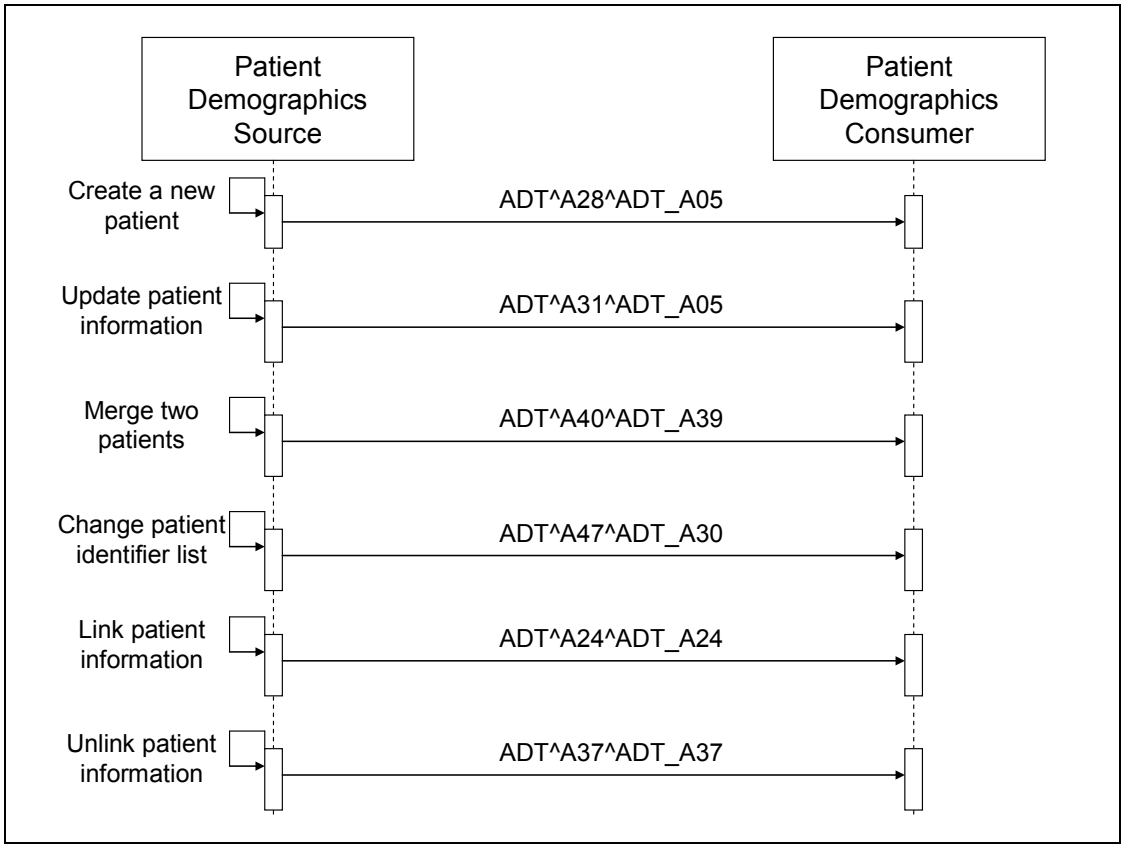


Figure 3.30-1: Interactions of transaction ITI-30

3.30.6.2 Create New Patient - ADT^A28^ADT_A05

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

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”.

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.

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

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 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			
ACC	Accident Information	O	[0..1]	6

Segment	Meaning	Usage	Card.	HL7 chapter
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

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".

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.

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

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.

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 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 profile 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

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.

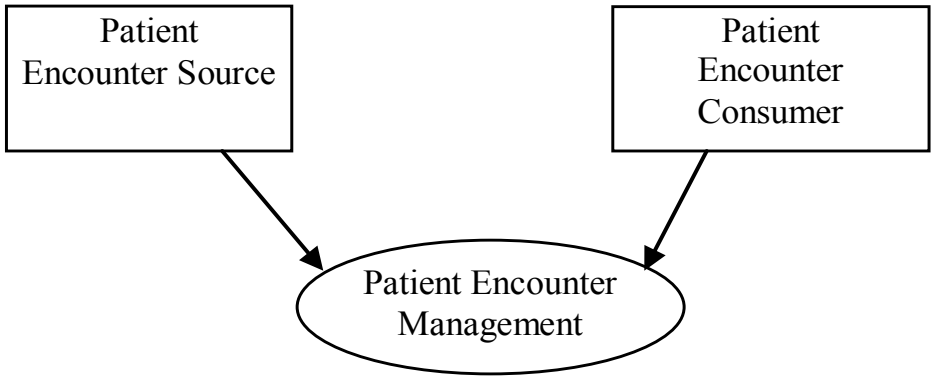
3.31.1 Scope

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.

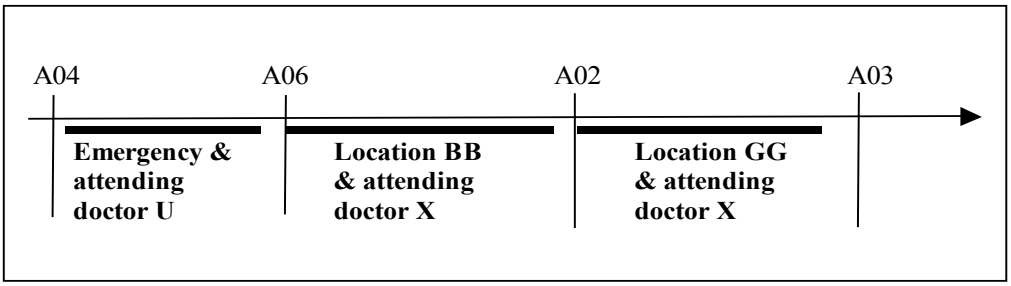
- **Cancel**: This action cancels a Movement that was erroneously recorded, and requests the receiver to delete this Movement from its database. Only the current Movement can be cancelled.

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

Category of event	Trigger / Action			
	insert		cancel	
Update patient information	A08	ADT^A08^ADT_A01		
Merge patient identifier list	A40	ADT^A40^ADT_A39		

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, without any further option, shall support these 7 trigger events and messages.

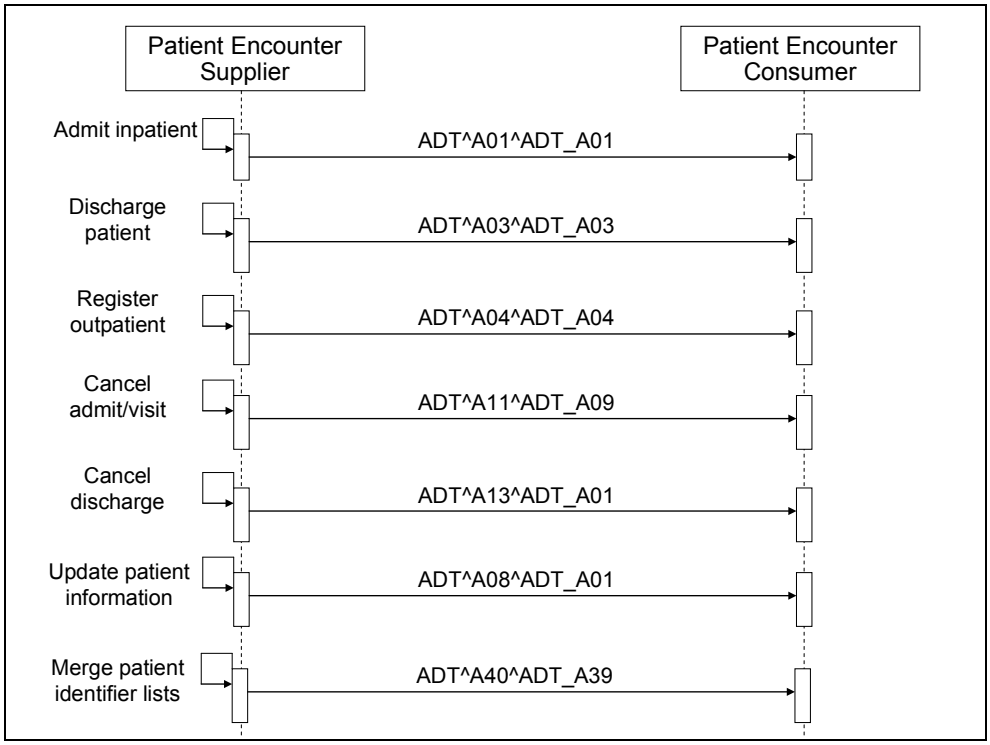


Figure 3.31-1 Interaction diagram for the basic subset

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:

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
Update patient information	A08	ADT^A08^ADT_A01		
Merge patient identifier lists	A40	ADT^A40^ADT_A39		
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 13 trigger events and messages.

Figure 3.31-2 depicts the messages added by this option to the basic subset.

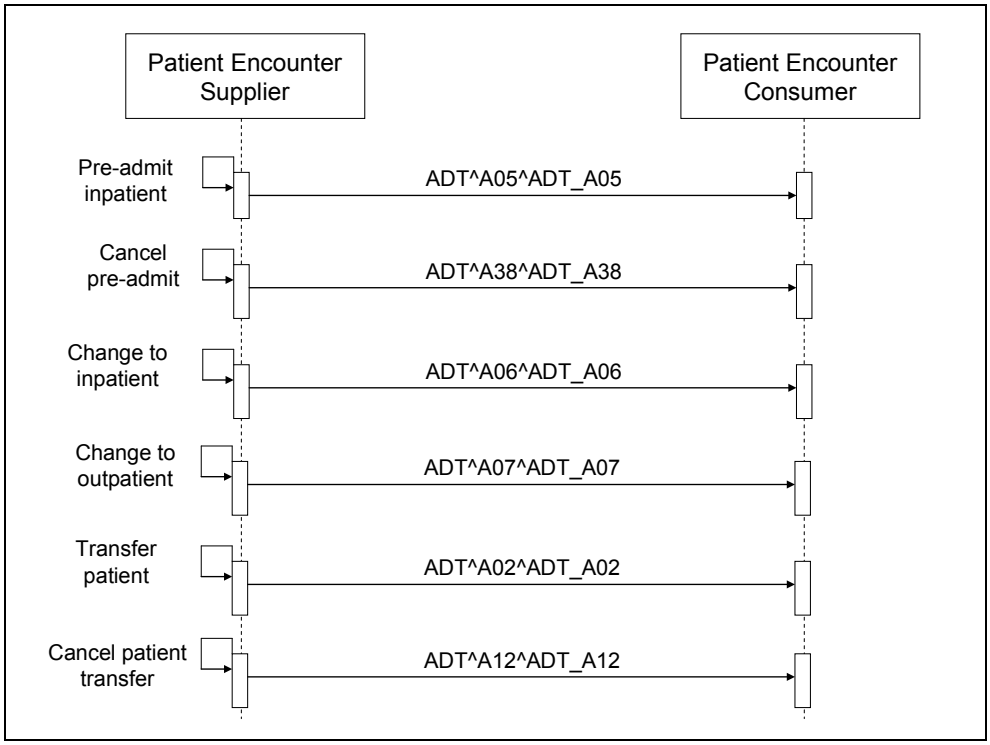


Figure 3.31-2 Additional interactions for "Inpatient/Outpatient Encounter Management" option

3.31.5.3 Pending Event Management Option

955 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
Update patient information	A08	ADT^A08^ADT_A01		
Merge patient identifier lists	A40	ADT^A40^ADT_A39		
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 19 trigger events and messages.

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

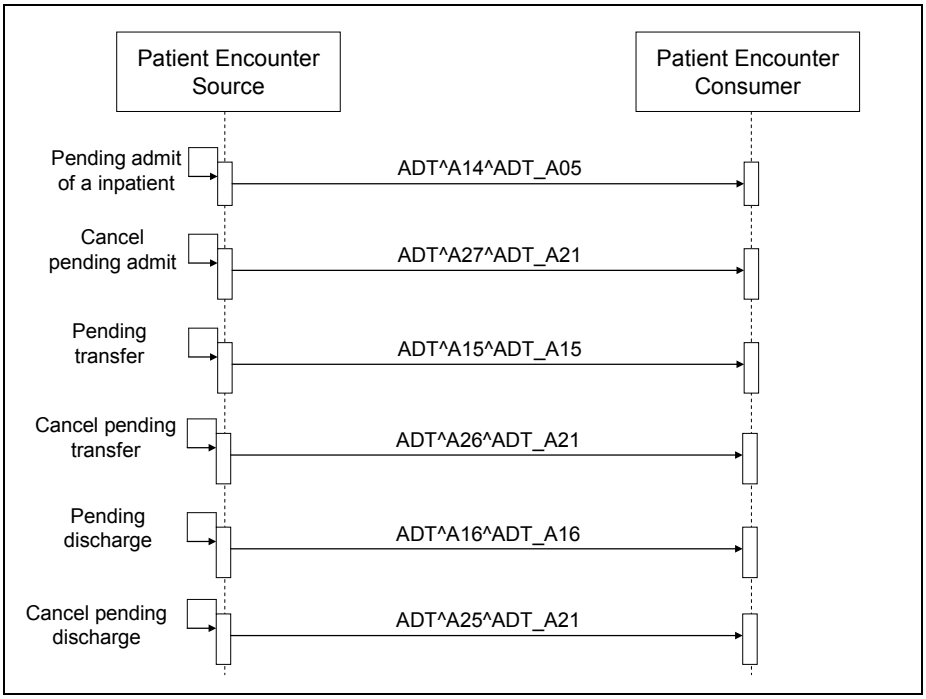


Figure 3.31-3 Additional interactions for "Pending Event Management" option

3.31.5.4 Advanced Encounter Management Option

965 This option provides support to manage changes of attending doctor, leaves of absence, and 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
Update patient information	A08	ADT^A08^ADT_A01		
Merge patient identifier lists	A40	ADT^A40^ADT_A39		
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		

970 A system implementing this option shall support these 15 trigger events and messages.

Figure 3.31-4 below depicts the messages added by this option to the basic subset.

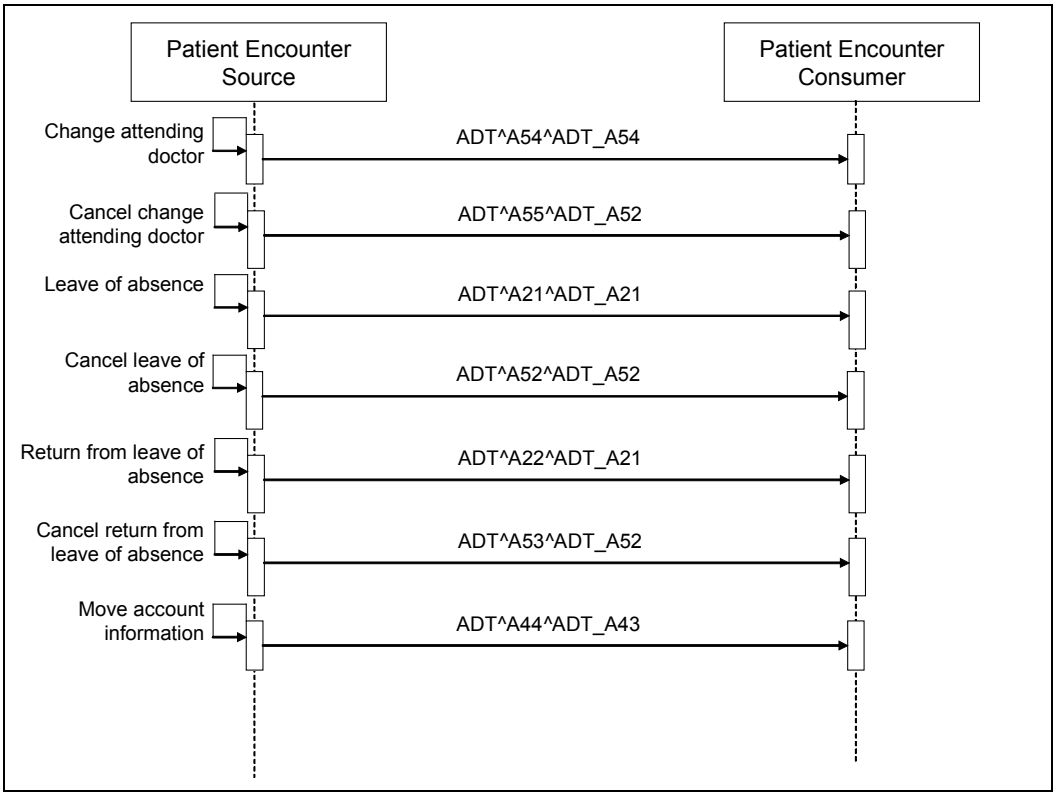


Figure 3.31-4 Additional interactions for "Advanced Encounter Management" option

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:

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
Update patient information	A08	ADT^A08^ADT_A01		
Merge patient identifier lists	A40	ADT^A40^ADT_A39		
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 10 trigger events and messages.

Figure 3.31-5 below depicts the messages added by this option to the basic subset.

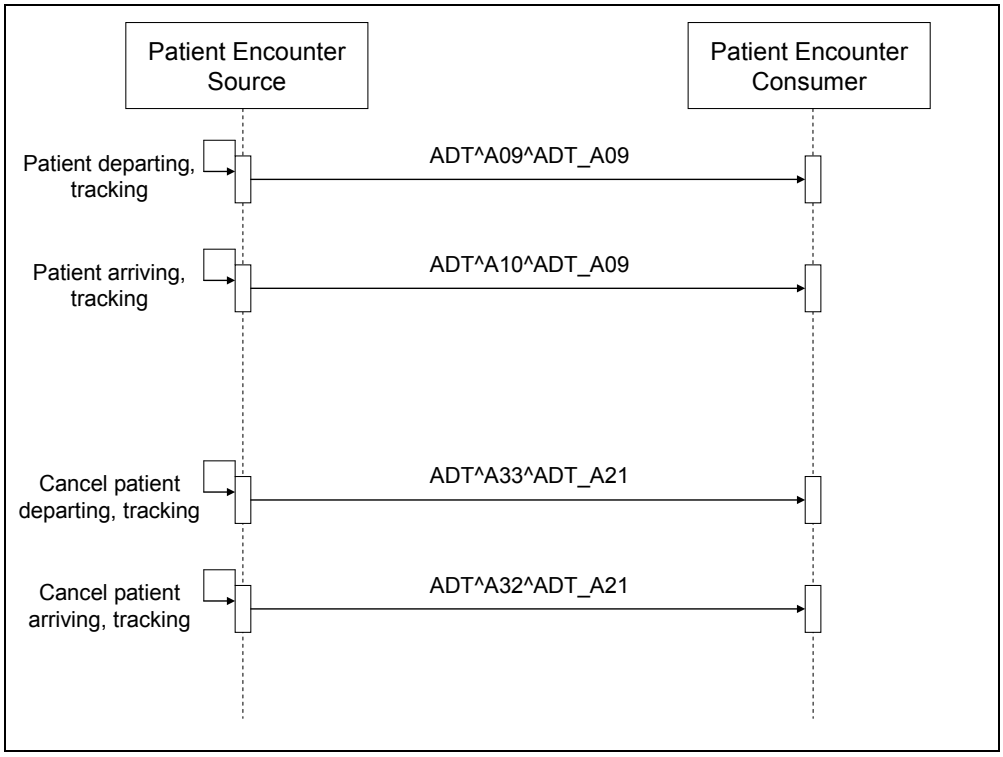


Figure 3.31-5 Additional interactions for "Temporary Patient Transfers Tracking" option

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:

- 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 ITI TF-2b: 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.

3.31.6 Common HL7 Message Segments

Messages in Transaction 31 use the same common HL7 message segments as those in Transaction 30; refer to ITI TF-2b: 3.30.5. In addition, messages in Transaction 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.

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.

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)

SEQ	LEN	DT	Usage	Card.	ELEMENT NAME
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.

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:

- 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.
- '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.

ZBE-7 – Responsible Ward (XON): Optional. This field may be further constrained in national extensions of this profile. 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 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

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

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
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 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

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 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 trigger event A01) or registered for an outpatient visit (via trigger event A04). See ITI TF-2b: 3.31.5.8 for the message to be used to cancel a pre-admit notification, and ITI TF-2b: 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

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 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 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 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..*]	

Segment	Meaning	Usage	Card.	HL7 chapter
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

3.31.7.3.3 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 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

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.

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 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..*]	
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.

If the patient is deceased, fields *PID-29-Patient Death Date and Time* and *PID-30-Patient Death Indicator* shall be populated.

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

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

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..*]	

Segment	Meaning	Usage	Card.	HL7 chapter
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

3.31.7.5.3 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.

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.

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 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

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
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 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

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 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 (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

Segment	Meaning	Usage	Card.	HL7 chapter
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

3.31.7.7.3 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 (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 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

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.

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 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
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

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.

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.

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
1250 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
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.

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*.

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 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)

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

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
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:

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 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.

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

Segment	Meaning	Usage	Card.	HL7 chapter
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*.

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 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*.

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 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

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

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
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

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

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.

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 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

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

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” 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 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 ITI TF-2b: 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.

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

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

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 ITI TF-2b: 3.30.5.2.

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.

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.

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 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).

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**.

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.

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

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

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.

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 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

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

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.

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 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).

3.31.7.24 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

Segment	Meaning	Usage	Card.	HL7 chapter
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

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*.

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, 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.

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 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

Segment	Meaning	Usage	Card.	HL7 chapter
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

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.

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.

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

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 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

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**.

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, 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

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 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

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 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**.

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 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 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 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).

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 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

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.

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 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 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

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

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
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..*]	

Segment	Meaning	Usage	Card.	HL7 chapter
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 ITI TF-2b: 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 profile 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.

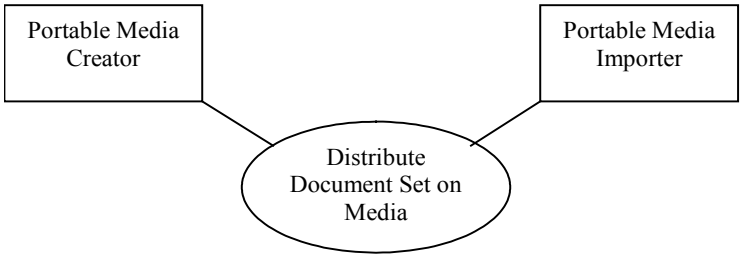
3.32 Distribute Document Set on Media

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

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



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.

3.32.3 Referenced Standard

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

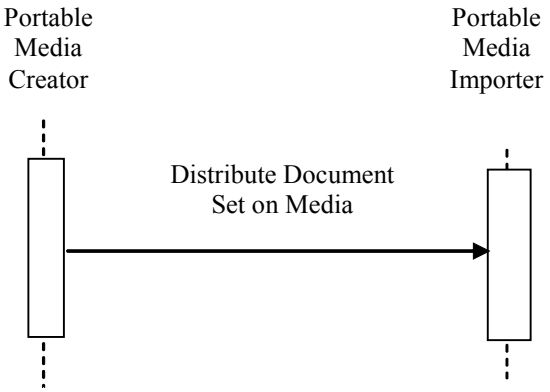
DICOM PS 3.12 Media Formats and Physical Media for Data Interchange, Annex F - 120mm CD-R media, Annex R - USB Connected Removable Devices, Annex V - ZIP File Over Media, and Annex W - Email Media. http://dicom.nema.org/

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.

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

MDN: RFC 3798 Message Disposition Notification. http://www.rfc-editor.org/rfc/rfc3798.txt

3.32.4 Interaction Diagram



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 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 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 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 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 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

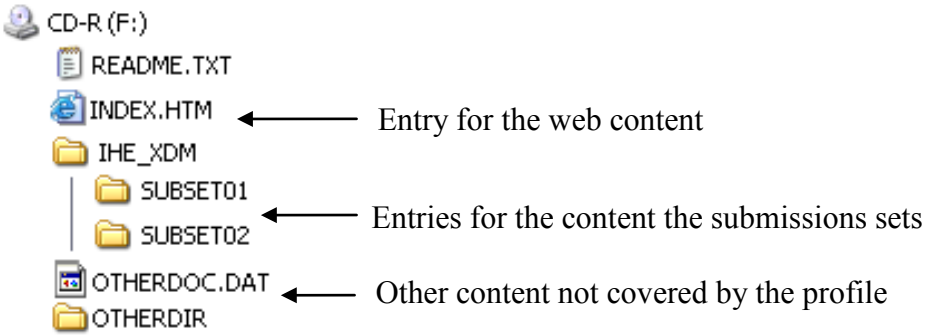


Figure 3.32.4.1-1 General structure of the media

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

- 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 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 PDI profile). The presence or absence of these files shall not affect performance of this transaction.

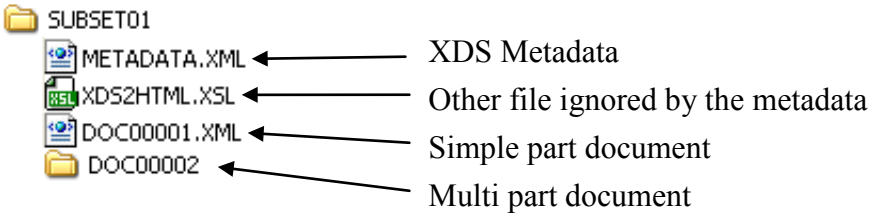


Figure 3.32.4.1-2 Structure of a submission set directory on the media

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: 4.1.7 Document Definition Metadata. This shall include all of the metadata that is specified for a Register Document Set-b [ITI-42]. 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.
- 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 table 4.1-5, attribute mimeType set to "multipart/related")
- Potentially other files and directories that are ignored by the Portable Media Importer

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.

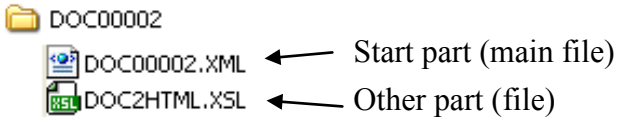


Figure 3.32.4.1-3 Structure on the media of a directory which is functionally equivalent to a "XDS multipart document"

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 "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 directory will contain many XDSDocumentEntry objects having their elements set as follows (see 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 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 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.
- 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 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
    - 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 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.

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
- 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 Actor. (i.e., all DICOM content on the media)
- 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

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-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)

3.32.4.1.3 Media Identification

The Portable Media Creator actor 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 integration profile.

If the ZIP over Email Response option is supported, Portable Media Creator shall be 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.

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 profile does not specify how errors should be processed because the variety of appropriate responses is too great.

In the case the media used is the ZIP file over Email, the subject line shall contain the phrase:

- 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.

Because 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 actor.

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 actor 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 actor 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 actor 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 actor 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 actor 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 actor 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 actor shall abide by the XDS Affinity Domain Policies represented by the confidentialityCode in the metadata associated with the document. The Portable Media Creator actor 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.

3.32.4.1.5 Security considerations

In the case of physical media, encryption of the CD-R or USB shall not be used.

In the case the media used is the ZIP file over Email, 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 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.

Portable Media Creators that create media shall generate one or more ATNA "Export" events into the audit trail to describe the media creation event. These events shall describe each submission set and/or study that is exported.

Portable Media Importers that import media shall generate one or more ATNA "Import" events into the audit trail to describe the media import event. These events shall describe each submission set and/or study that is imported.

Note: It is easy to build a partial implementation of actors in the XDM profile that lack the auditing capability. For example, a person can manually create media that comply with the requirements of the XDM media. It is possible that the manual process omits the generation of audit records for their activity. This would not be a compliant or complete implementation of the actors, but it is easy to make this kind of mistake.

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 user if any errors are detected.

3.33 Intentionally Left Blank

3.34 Intentionally Left Blank

3.35 Intentionally Left Blank

3.36 Intentionally Left Blank

3.37 Intentionally Left Blank3.38 Cross Gateway Query

This section corresponds to Transaction 38 of the IHE Technical Framework. Transaction 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 transaction [ITI-18]. 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

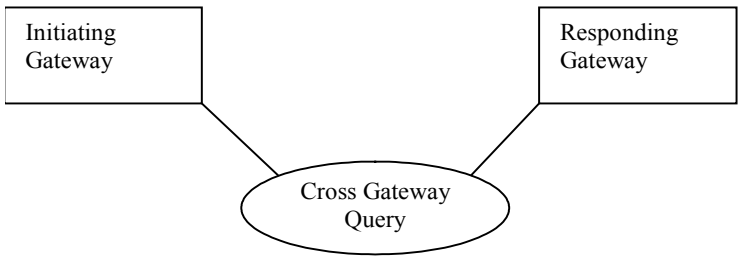


Figure 3.38.2-1 Use Case Roles

Actor: Initiating Gateway

Role: To formulate a Cross Gateway Query on behalf of a user.

Actor: Responding Gateway

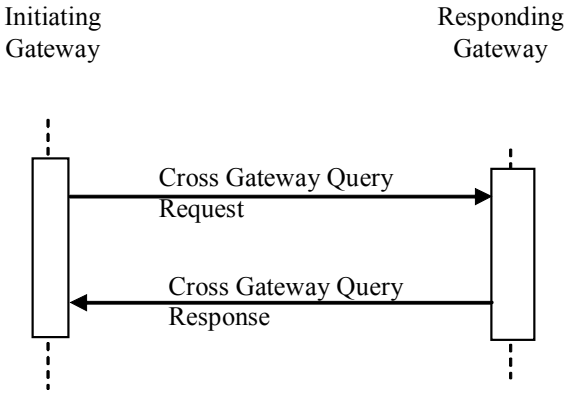
Role: To respond to a Cross Gateway Query based on the internal configuration of the community.

3.38.3 Referenced Standard

Implementers of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V Web Services for IHE Transactions.

ebRIM	OASIS/ebXML Registry Information Model v3.0
ebRS	OASIS/ebXML Registry Services Specifications v3.0
Appendix V	ITI TF-2x: Appendix V: Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use

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 request contains:

- A reference to a pre-defined query defined by the Registry Stored Query transaction [ITI-18].
- 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 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 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. 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

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`.

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.
- 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 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" … >`

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. This restriction is expected to be temporary as query syntax is extended to handle multiple homeCommunityIds in a single query request.

3.38.4.1.2.2 Specifying patient identifier

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 profile. 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, 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, 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 and which rely on specialized concepts.

Table 3.38.4.1.2.3-1

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

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 actor shall:

- Return an XDSUnknownCommunity error code if the value of homeCommunityId is 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 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 the value identifying the Responding Gateway's community 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.
- Ensure that every RegistryError element returned in the response shall have the location attribute set to the homeCommunityId of the Responding Gateway.

The Initiating Gateway actor 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 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 RespondingGateway that returned the invalid response and the 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 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].

3.38.4.1.4 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.
- 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:

- 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

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

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", 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"
- 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:A	urn:ihe:iti:2007:CrossGatewayQuery

ction	Response
/definitions/binding/operation/soap12:operation/@soapAction	urn:ihe:iti:2007:CrossGatewayQuery

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 ITI TF-2b: 3.38.5.1 Sample SOAP Messages.

For informative WSDL for the Responding Gateway actor 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/>, <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.

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

This section corresponds to Transaction 39 of the IHE Technical Framework. Transaction 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

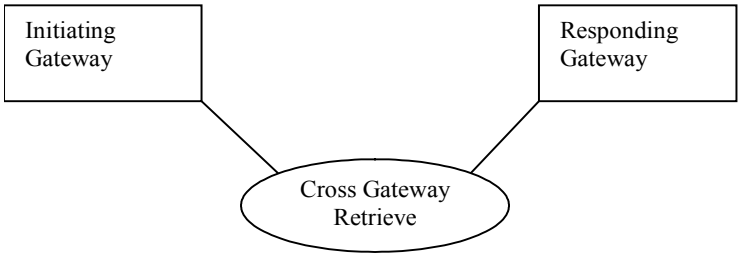


Figure 3.39.2-1 Use Case Roles

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.

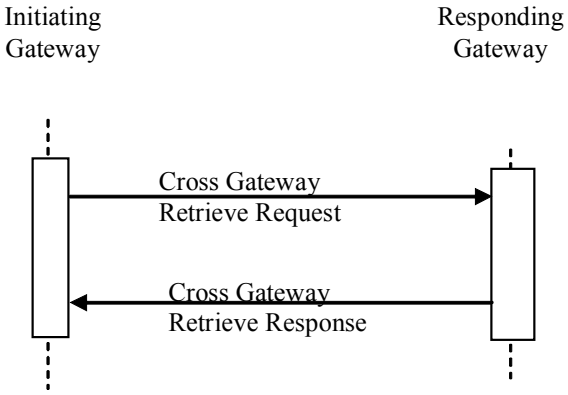
ebRIM OASIS/ebXML Registry Information Model v3.0

ebRS OASIS/ebXML Registry Services Specifications v3.0

Appendix V ITI TF-2x: Appendix V: Web Services for IHE Transactions
Contains references to all Web Services standards and requirements of use

MTOM SOAP Message Transmission Optimization Mechanism
http://www.w3.org/TR/soap12-mtom/

3.39.4 Interaction Diagram



3.39.4.1 Cross Gateway Retrieve

The Cross Gateway Retrieve uses the same syntax and standards as the Retrieve Document Set transaction specified in XDS. See ITI TF-2b: 3.43.

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.

3.39.4.1.2 Message Semantics

The message semantics for Cross Gateway Retrieve are the same as Retrieve Document Set. See ITI TF-2b: 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.

3.39.4.1.3 Expected Actions

Actors supporting this transaction shall support the Expected Actions described in the ITI TF-2b: 3.43.4.1.3.

The Responding Gateway shall determine the local system or systems which hold the documents 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 reflect both failure and success. The Responding Gateway may alternatively choose to suppress the failures and report only successes.

Every RegistryError element returned in the response shall have the location attribute set to the homeCommunityId of the Responding Gateway.

If the XDS Affinity Domain Option is supported, the Initiating Gateway actor 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 RegistryErrorList elements in one response and specify PartialSuccess status.

3.39.4.1.4 Security Considerations

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 ITI TF-2b: 3.43.6.
- 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 ITI TF-2b: 3.43.6.
- In addition, if interacting with a local Document Repository, shall audit as if it were a Document Consumer. See ITI TF-2b: 3.43.6. One audit record shall be created for each 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 ITI TF-2b: 3.43.6.
- In addition, if interacting with a local Document Repository, shall audit as if it were a Document Consumer. See ITI TF-2b: 3.43.6. One audit record shall be created for each Document Repository contacted.

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

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/soap12:operation/@soapAction	urn:ihe:iti:2007:CrossGatewayRetrieve

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 ITI TF-2b: 3.43.5.1 Sample SOAP Messages.

For informative WSDL for the Responding Gateway actor see ITI TF-2x: Appendix W.

The <ihe:RetrieveDocumentSetRequest/> element is defined in ITI TF-2b: 3.43.5. When used within the Cross Gateway Retrieve the <ihe:HomeCommunityId/> element is required.

The <ihe:RetrieveDocumentSetResponse/> element is defined in ITI TF-2b: 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 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: 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
               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>
               <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>
       </s:Header>
       <s:Body>
               <RetrieveDocumentSetRequest xmlns="urn:ihe:iti:xds-b:2007">
                       <DocumentRequest>
                               <HomeCommunityId>urn:oid:1.2.3.4</HomeCommunityId>
                               <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>
                               <RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
                               <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
                       </DocumentRequest>
               </RetrieveDocumentSetRequest>
       </s:Body>
</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">
       <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>

       <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>
       </s:Header>
       <s:Body>
               <RetrieveDocumentSetRequest xmlns="urn:ihe:iti:xds-b:2007">
                       <DocumentRequest>
                               <HomeCommunityId>urn:oid:1.2.3.4</HomeCommunityId>
                               <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>
                               <RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
                               <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
                       </DocumentRequest>
               </RetrieveDocumentSetRequest>
       </s:Body>
</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"
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>
	</s:Header>
	<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"
				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>
				<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>

	<Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
			</DocumentResponse>
			<DocumentResponse>
				<HomeCommunityId>urn:oid:1.2.3.5</HomeCommunityId>
				<RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
				<DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
				<mimeType>text/xml</mimeType>

	<Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
			</DocumentResponse>
		</RetrieveDocumentSetResponse>
	</s:Body>
</s:Envelope>
```

3.39.5.1.2.2 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:CrossGatewayRetrieveResponse</a:Action>
		<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>
	<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"
				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>
				<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>
```



```
        <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
                    </DocumentResponse>
                    <DocumentResponse>
                            <HomeCommunityId>urn:oid:1.2.3.5</HomeCommunityId>
                            <RepositoryUniqueId>1.3.6.1.4...2000</RepositoryUniqueId>
                            <DocumentUniqueId>1.3.6.1.4...2301</DocumentUniqueId>
                            <mimeType>text/xml</mimeType>

        <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
                    </DocumentResponse>
                </RetrieveDocumentSetResponse>
        </s:Body>
</s:Envelope>
```

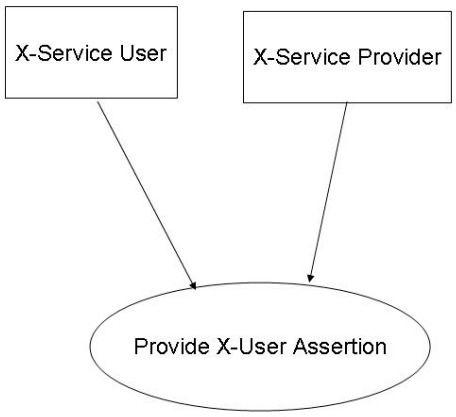
3.40 Provide X-User Assertion

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**' as the third party issuer of the claimed identity assertion.

3.40.2 Use Case Roles



Actor: X-Service User

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 profile

- 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 (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

3.40.3.2 Informative -- assist with understanding or implementing this profile

- IHE Profiles
  - Personnel White Pages Profile
  - Enterprise User Authentication Profile
  - Basic Patient Privacy Consents Profile
- OASIS-OPEN
  - 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
  - WS-Trust - OASIS Web Services Secure Exchange (WS-SX) TC

3.40.4 Interaction Diagram

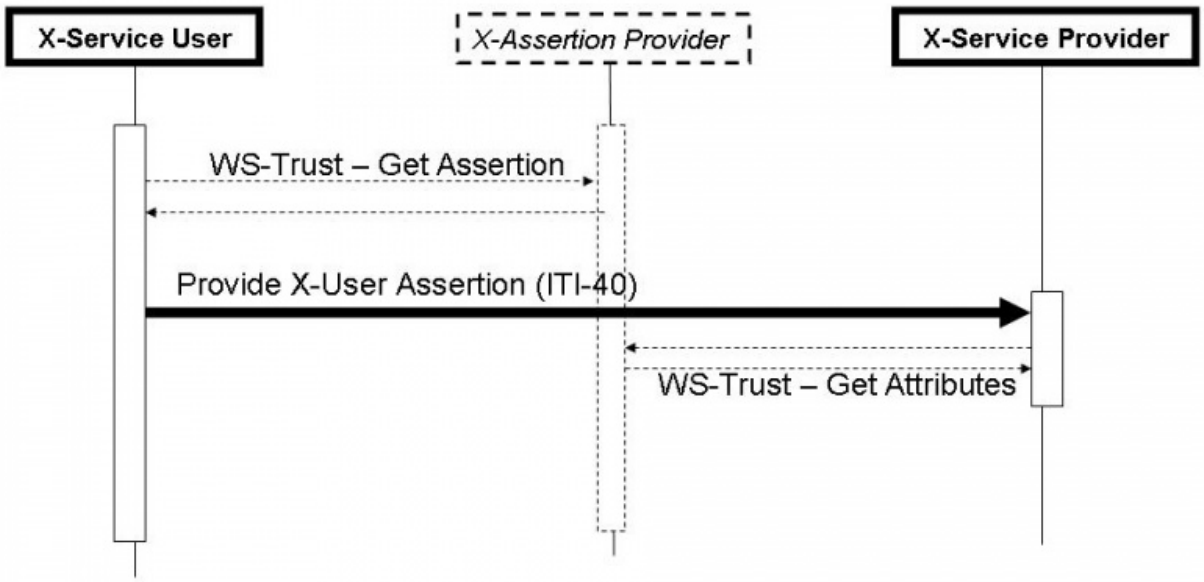


Figure 40.1-1 X-User Assertion Messages

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 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).

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 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.

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 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 Repository.

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 3.40.4.2 ATNA Audit encoding). For example: The XDS.b Document Consumer Actor 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 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).
    - 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
    - **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 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 AuthnContextDeclRef
- 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 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.

3.40.4.1.3 Expected Actions

The X-Service Provider shall validate the Identity Assertion by processing the Web-Services 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 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 ITI TF-2b: 3.40.4.2 ATNA Audit encoding). For example: The XDS.b Registry Stored Query Actor 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 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.

3.40.4.2 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">"

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 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].

3.41 Provide and Register Document Set-b

This section corresponds to Transaction [ITI-41] of the IHE Technical Framework. Provide and Register Document Set-b is used by the Document Source to provide a set of documents to the Document Repository, and to request that the Document Repository store these documents and then register them with the Document Registry. The Document Source may also provide a set of documents to a Document Recipient.

Integration Profiles using this Transaction
Cross-Enterprise Document Sharing-b (XDS.b)
Cross-Enterprise Document Reliable Interchange (XDR)

The Provide and Register Document Set-b transaction describes the interaction between the Document Source and the Document Recipient actors, and the Document Source and Document Repository actors. The interaction between the Document Repository and the XDS Document Registry is described separately in the Register Document Set-b Transaction [ITI-42].

This transaction aligns with the Registry Services standard (ebRS) for the format of the document metadata as defined in ITI TF-3: 4.1. The ebRS standard covers the interaction with a service that includes a registry with integrated repository. From the point of view of the Document Source, the separate nature of the XDS Document Registry and Document Repository actors is not relevant.

By specifying separate Document Registry and Document Repository actors, XDS offers additional flexibility of having a single Document Registry index content for multiple Document Repositories. The ebRIM portion of the registry standard supports this possibility though the ExternalLink object type.

In XDS, the documents and metadata go to the Document Repository actor and then the metadata is forwarded on to the Document Registry actor. They move in this direction for several reasons:

- Allows best reuse of ebXML Registry specified metadata and web services protocols
- Document Source only needs to know the identity of the Document Repository. Document Repository knows the identity of the Document Registry. If Provide and Register Document Set-b transaction were sent to the Document Registry then routing decisions for documents would be more complex.
- Resulting protocols are simpler

- Simplifies the common case where the Document Source and the Document Repository are grouped.

Actors that support the Asynchronous Web Services Exchange option and implement the Provide and Register Document Set-b [ITI-41] transaction 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.

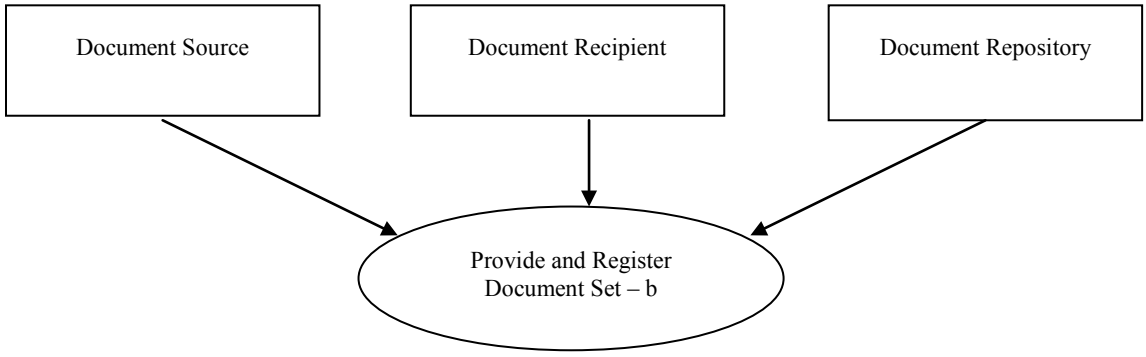
3.41.1 Scope

The Provide and Register Document Set-b transaction passes a Repository Submission Request (see ITI TF-3: 4.1.3.1) from a Document Source to a Document Repository or Document Recipient.

A Provide and Register Document Set-b transaction shall carry:

- Metadata describing zero or more documents
- Within metadata, one XDSDocumentEntry object per document
- XDS Submission Set definition along with the linkage to new documents and references to existing documents
- Zero or more XDS Folder definitions along with linkage to new or existing documents
- Zero or more documents

3.41.2 Use Case Roles



Actor: Document Source

Role: A system that submits documents and associated metadata to a Document Repository. Detailed requirements for this actor are discussed in ITI TF-2b: 3.41.6.1.**Actor:** Document Recipient

Actor: Document Recipient

Role: A system that receives a set of documents. Typically this document set will be made available to the intended recipient who will chose to either view it or integrate it into the Electronic Healthcare Record (EHR).

Detailed requirements for this actor are discussed in ITI TF-2b: 3.41.6.2.

Actor: Document Repository

Role: A document storage system that receives documents and associated metadata and:

- Stores the documents
- Enhances submitted metadata with repository information to enable later retrieval of documents
- Forwards the enhanced metadata to the Document Registry.

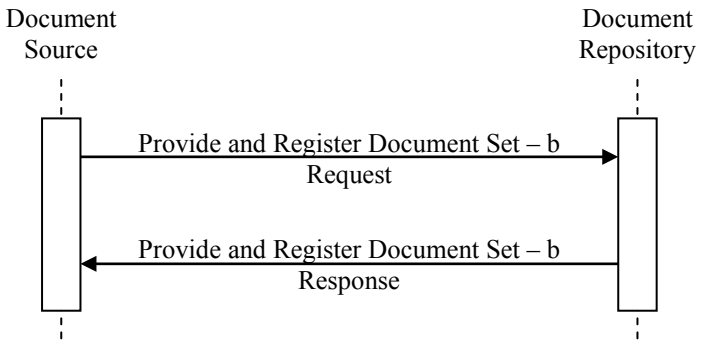
Detailed requirements for this actor are discussed in ITI TF-2b: 3.41.6.2.

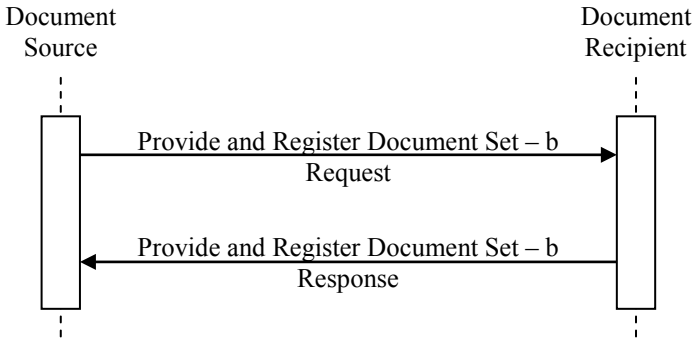
3.41.3 Referenced Standards

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
Appendix V	ITI TF-2x:Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use
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/

3.41.4 Interaction Diagrams





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3.41.4.1 Provide and Register Document Set-b Request

A Document Source sends documents and associated metadata to a Document Recipient, or a Document Repository that has an associated Document Registry.

The Document Repository shall, upon receipt of a Provide and Register Document Set-b [ITI-41] transaction send a corresponding Register Document Set-b [ITI-42] transaction to the Document Registry actor.

- The Document Repository actor shall create and insert the XDSDocumentEntry.repositoryUniqueId, XDSDocumentEntry.size, and XDSDocumentEntry.hash attributes for each document received from the Provide and Register Document Set-b [ITI-41] transaction into the resulting Register Document Set-b [ITI-42] transaction metadata. The combination of XDSDocumentEntry.uniqueId and XDSDocumentEntry.repositoryUniqueId attributes value shall later be accepted in a Retrieve Document Set transaction [ITI-43] for that document and the document shall be returned.

3.41.4.1.1 Trigger Events

The Document Source, based on a human decision or the application of a certain rule of automatic operation, wants to submit

- A set of zero or more documents to the Document Repository and the associated metadata to the Document Registry.

or

- A set of one or more documents to a Document Recipient.

3.41.4.1.2 Message Semantics

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.

3.41.4.1.3 Expected Actions

The Provide and Register Document Set-b message shall include the metadata attributes (as defined in ITI TF-3: 4.1.7 Document Definition Metadata)

A Document Recipient receives the metadata and the associated document(s). It shall be able to interpret the submission without any context (e.g., a prior submission).

The Document Source may include Folders in metadata. If the Document Recipient is not able to process the Folder specific content it shall return a PartialFolderContentNotProcessed warning which includes a textual description identifying that Folder Content was not processed. In this case the Document Recipient is expected to have processed the rest of the submission successfully.

In the case where the Document Source submits a replacement of documents, if the Document Recipient is not able to process the replacement semantics in the submission it shall return a PartialReplaceContentNotProcessed warning which includes a textual description identifying that the replacement semantics were not processed. In this case the Document Recipient is expected to have processed the rest of the submission successfully.

A Document Repository shall forward the metadata to the Document Registry using the Register Document Set-b transaction [ITI-42].

The Document Repository receives this message. Each document within the message shall be stored into the Document Repository as an octet stream with an associated MIME type.

The Document Source shall supply all necessary document metadata attributes with the exception of the ones below. The Document Repository shall modify the received document metadata before initiating the Register Document Set-b transaction to the Document Registry by adding/replacing:

- The repositoryUniqueId for this Document Repository to allow for the Document Consumer to correctly identify the proper Document Repository for each document (XDSDocumentEntry.repositoryUniqueId).
- A hash value (XDSDocumentEntry.hash)
- A size (XDSDocumentEntry.size).

A Register Document Set-b transaction with this modified metadata shall be issued to the Document Registry.

The Document Repository shall ensure that when any Retrieve Document Set transaction is received requesting a specific document(s), it shall be provided to the Document Consumer unchanged from the octet stream that was submitted (full fidelity repository) and shall match the size and hash attributes of the XDSDocumentEntry object.

If the Document Repository or Document Recipient detects a failure it shall return an error message to the Document Source thus terminating this transaction. The conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: 4.1.13 Error Reporting.

3.41.4.1.3.1 Basic Patient Privacy Enforcement Option

If the Basic Patient Privacy Enforcement Option is implemented:

1. The Document Source actor shall populate the confidentialityCode in the document metadata with the list of values that identify the sensitivity classifications that apply to the associated document. The confidentiality codes for different documents in the same submission may be different.
2. The Document Source actor 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 XDS Affinity Domain Policy. The details of this are product specific and not specified by IHE.
3. The Document Source actor 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. However, the information about how confidentiality codes are assigned must be part of the published policy for the XDS Affinity Domain. Note: For example, when publishing a document, the Document Source, might show a list of checkboxes where a user can select which of the available consents a document is to be published.
4. The Document Recipient actor 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 Document Recipient actor shall have the ability to coerce the confidentiality code in the metadata associated with the document from the codes used by the Document Source to the codes used by the Document Recipient.
6. The Document Recipient actor shall abide by the XDS Affinity Domain Policies represented by the confidentialityCode in the metadata associated with the document. The Document Recipient actor 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.

3.41.4.2 Provide and Register Document Set-b Response

The Document Repository or Document Recipient shall send a Provide and Register Document Set-b Response when the processing of a Provide and Register Document Set-b Request is complete.

The Provide and Register Document Set-b Response message shall carry the status of the requested operation and an error message if the requested operation failed. The conditions of

failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: 4.1.13 Error Reporting.

3.41.4.2.1 Trigger Events

The following events can trigger this message:

- Documents successfully received and processed by the Document Recipient
- Documents were not successfully received by the Document Recipients
- Documents stored to the Document Repository successfully and metadata stored to the Document Registry successfully (The registry part is carried out as part of a Register Document Set-b transaction)
- Documents stored to the Document Repository successfully but an error occurred in storing the metadata to the Document Registry
- Documents were not successfully stored to the Document Repository

3.41.4.2.2 Message Semantics

The Provide and Register Document Set-b Response message shall carry the status of the requested operation and an error message if the requested operation failed. The conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: 4.1.13 Error Reporting.

3.41.4.2.3 Expected Actions

The Document Source now knows that the transaction succeeded/failed and can continue.

The document(s) received by the Document Recipient shall be available for further processing according to the capabilities of the system. These capabilities are not specified by IHE, but may include viewing the document or storing them to an Electronic Healthcare Record (EHR).

The document(s) added to the Document Repository are now available for retrieval. The metadata added to the registry shall be available for discovery via Registry Stored Query transactions.

3.41.5 Protocol Requirements

Implementors of this transaction shall comply with all requirements described in ITI TF-2x :Appendix V: Web Services for IHE Transactions.

The Provide and Register Document Set-b transaction shall use SOAP12 and MTOM with XOP encoding (labeled MTOM/XOP in this specification). See ITI TF-2x: Appendix V for details.

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 Provide and Register Document Set-b transaction presented in the order in which they would appear in the Document Repository WSDL definition:

- The following types shall be imported (xsd:import) in the /definitions/types section:
  - namespace="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0", schema="rs.xsd"
  - namespace="urn:ihe:iti:xds-b:2007", schemaLocation="IHEXDS.xsd"
- The /definitions/message/part/@element attribute of the Provide and Register Document Set-b Request message shall be defined as “ihe:ProvideAndRegisterDocumentSetRequest”
- The /definitions/message/part/@element attribute of the Provide and Register Document Set-b Response message shall be defined as “rs:RegistryResponse”
- Refer to Table 3.41.5.b below for additional attribute requirements
- To support the Asynchronous Web Services Exchange option on the Document Source, the Document Repository shall support the use of a non-anonymous response EPR in the WS-Addressing replyTo header.

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 ITI TF-2b: 3.41.5.1 Sample SOAP Messages.

For informative WSDL for the Document Repository actor see ITI TF-2x: Appendix W.

The <ihe:ProvideAndRegisterDocumentSetRequest/> element is defined as:

- One <lcm:SubmitObjectsRequest/> element that contains the submission set metadata
- Zero or more <ihe:Document/> elements that contain the base64encoded data for the documents being submitted to the Document Repository or Document Recipient. The <ihe:Document/> element also includes the document id attribute (ihe:Document/@id) of type xsd:anyURI to match the document ExtrinsicObject id in the metadata and providing the necessary linkage

The use of MTOM/XOP is governed by the following rules:

- The Document Repository or Document Recipient shall accept documents in a Provide and Register Document Set-b transaction in MTOM/XOP format. The response message shall use MTOM/XOP format.
- The Document Source shall generate Provide and Registry Document Set-b transactions in MTOM/XOP format. It shall accept the response message in MTOM/XOP format.

Table 3.41.5. b Additional Attribute Requirements

Attribute	Value
/definitions/portType/operation @name	DocumentRepository_ ProvideAndRegisterDocumentSet-b
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2007: ProvideAndRegisterDocumentSet-b
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2007: ProvideAndRegisterDocumentSet-bResponse

Attribute	Value
/definitions/binding/operation/soap12:operation/@soapAction	urn:ihe:iti:2007:CrossGatewayQuery

A full XML Schema Document for the XDS.b types is available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.41.5.1 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/>, <ReplyTo/>…; these WS-Addressing headers are populated according to the 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.

Samples presented in this section are also available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.41.5.1.1 Sample Provide and Register Document Set-b SOAP Request

3.41.5.1.1.1 Synchronous Web Services Exchange

```
POST /axis2/services/repository HTTP/1.1
Content-Type: multipart/related; boundary=MIMEBoundaryurn_uuid_76A2C3D9BCD3AECFF31217932910180;
type="application/xop+xml"; start="<0.urn:uuid76A2C3D9BCD3AECFF31217932910181@apache.org>";
start-info="application/soap+xml"; action="urn:ihe:iti:2007:ProvideAndRegisterDocumentSet-b"
User-Agent: Axis2
Host: localhost:4040
Content-Length: 4567

--MIMEBoundaryurn_uuid_76A2C3D9BCD3AECFF31217932910180
Content-Type: application/xop+xml; charset=UTF-8; type="application/soap+xml"
Content-Transfer-Encoding: binary
Content-ID: <0.urn:uuid:76A2C3D9BCD3AECFF31217932910181@apache.org>

<?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:To>http://localhost:4040/axis2/services/test11966a</wsa:To>
        <wsa:MessageID>urn:uuid:76A2C3D9BCD3AECFF31217932910053</wsa:MessageID>
        <wsa:Action soapenv:mustUnderstand="1">urn:ihe:iti:2007:ProvideAndRegisterDocumentSet-
b</wsa:Action>
    </soapenv:Header>
    <soapenv:Body>
        <xdsb:ProvideAndRegisterDocumentSetRequest xmlns:xdsb="urn:ihe:iti:xds-b:2007">
            <lcm:SubmitObjectsRequest xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0">
                <rim:RegistryObjectList xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">

                 <!-- Registry Metadata goes here -->

                </rim:RegistryObjectList>
            </lcm:SubmitObjectsRequest>
            <xdsb:Document id="Document01">
                <xop:Include href="cid:1.urn:uuid:76A2C3D9BCD3AECFF3121793290229@apache.org"
                    xmlns:xop="http://www.w3.org/2004/08/xop/include"/>
            </xdsb:Document>
        </xdsb:ProvideAndRegisterDocumentSetRequest>
```



```
    </soapenv:Body>
</soapenv:Envelope>

--MIMEBoundaryurn_uuid_76A2C3D9BCD3AECFF31217932910180
Content-Type: text/plain
Content-Transfer-Encoding: binary
Content-ID: <1.urn:uuid:76A2C3D9BCD3AECFF31217932910229@apache.org>

This is my document.

It is great!


--MIMEBoundaryurn_uuid_76A2C3D9BCD3AECFF31217932910180--
```


3.41.5.1.1.2 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:ProvideAndRegisterDocumentSet-
b</a:Action>
              <a:MessageID>urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</a:MessageID>
              <a:ReplyTo>
                     <a:Address>—http://192.168.2.4:9080/XdsService
/DocumentSourceReceiver.svc</a:Address>
              </a:ReplyTo>
              <a:To
s:mustUnderstand="1">http://localhost:2647/XdsService/DocumentRepositoryReceiver.svc</a:To>
       </s:Header>
       <s:Body>
              <ProvideAndRegisterDocumentSetRequest
                            xmlns="urn:ihe:iti:xds-b:2007"
                            xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm: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">

                     <lcm:SubmitObjectsRequest>

                            <!—Rest of SubmitObjectsRequest message goes here -->
                     </lcm:SubmitObjectsRequest>
                     <Document
id="Document01">UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
              </ProvideAndRegisterDocumentSetRequest>
       </s:Body>
</s:Envelope>
```

3.41.5.1.2 Sample Provide and Register Document Set-b SOAP Response

3.41.5.1.2.1 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:ProvideAndRegisterDocumentSet-bResponse
   </a:Action>
   <a:RelatesTo>urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</a:RelatesTo>
  </s:Header>
  <s:Body>
   <rs:RegistryResponse
    status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"
    xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0" />
  </s:Body>
</s:Envelope>
```

3.41.5.1.2.2 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:ProvideAndRegisterDocumentSet-bResponse
              </a:Action>
              <a:MessageID>urn:uuid:D6C21225-8E7B-454E-9750-821622C099DB</a:MessageID>
```



```
                <a:RelatesTo>urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</a:RelatesTo>
                <a:To
s:mustUnderstand="1">http://localhost:2647/XdsService/DocumentSourceReceiver.svc</a:To>
        </s:Header>
        <s:Body>
                <rs:RegistryResponse
                        status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"
                        xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0" />
        </s:Body>
</s:Envelope>
```

3.41.6 Actor Requirements

This section summarizes the responsibilities of the actors relevant to this transaction.

3.41.6.1 Document Source

An implementation of the Document Source actor shall be capable of the following operations:

- Submit one or more documents. Whether a submission contains a single or multiple documents depends on workflows, policies, and other external factors which are outside of the scope of this transaction.

An implementation of the XDS Document Source actor may support one or more of the following XDS.b options:

- **Document Replace Option:** In this option the Document Source offers the ability to submit a document as a replacement for another document already in the registry/repository.
- **Document Addendum Option** In this option the Document Source shall offer the ability to submit a document as an addendum to another document already in the registry/repository.
- **Document Transformation Option** In this option the Document Source shall offer the ability to submit a document as a transformation of another document already in the registry/repository.

Note: In order to support document replacement/addendum/transformation grouping with the Document Consumer may be necessary in order to Query the registry (e.g., for UUIDs of existing document entries)

- **Folder Management Option.** In this option the Document Source offers the ability to perform the following operation:
  - Create a folder
  - Add one or more documents to a folder

Note: In order to support document addition to an existing folder, grouping with the Document Consumer may be necessary in order to Query the registry (e.g., for UUIDs of existing folder).

These operations are discussed in ITI TF-3: 4.1.3.4 Other Properties of Submission Requests.

3.41.6.2 Document Repository or Document Recipient

A Document Repository or Document Recipient shall be capable of accepting submissions containing multiple documents.

Note: The Document Source may submit single documents or multiple documents depending on its needs.

A Document Repository shall validate the following metadata element received as part of a Provide and Register transaction:

- **XDSDocumentEntry.uniqueId** – a submission shall be rejected if not unique within the repository and the hashes of the two documents do not match. If the hashes of the documents match, the Document Repository shall accept the duplicate document.

A Document Repository or Document Recipient shall validate the following metadata element received as part of a Provide and Register transaction:

- **XDSSubmissionSet.sourceId** – a Document Repository or Document Recipient may choose to accept submissions only from certain sources and use this field to perform the filtering.
- **XDSDocumentEntry.hash** – a submission shall be rejected if the hash is included in the submission and its value does not match the hash for the received document (ignoring case), as calculated by the Document Repository or Document Recipient; an XDSRepositoryMetadataError shall be returned on mismatch.
- **XDSDocumentEntry.size** – a submission shall be rejected if the size is included in the submission and its value does not match the size of the received document, as computed by the Document Repository or Document Recipient; an XDSRepositoryMetadataError shall be returned on mismatch.

3.41.7 Security Considerations

Relevant XDS Affinity Domain security considerations are discussed in the XDS Security Considerations Section (see ITI TF-1: 10.7).

3.41.7.1 Audit Record Considerations

The Provide and Register Document Set-b Transaction is PHI-Export event, as defined in ITI TF-2a: Table 3.20.6-1. The Actors involved in the transaction shall create audit data in conformance with DICOM (Supp 95) “Data Export”/”Data Import”, with the following exceptions.

3.41.7.1.1 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-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	The content of the <wsa:ReplyTo/> element.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.
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	*NA*	
	NetworkAccessPointID	*NA*	

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, as specified in RFC 3881.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient (AudittMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 (AudittMessage/ 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*

3.41.7.1.2 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)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	The content of the <wsa:ReplyTo/> element.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.

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, as specified in RFC 3881.

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	EV(2, RFC-3881, "Patient Number")
	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/ 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*

3.42 Register Document Set-b

This section corresponds to transaction [ITI-42] of the IHE IT Infrastructure Technical Framework. Transaction [ITI-42] is used by the Document Repository Actor to register a set of documents with the Document Registry in XDS.b.

Integration Profiles using this Transaction
Cross-Enterprise Document Sharing-b (XDS.b)

Actors that support the Asynchronous Web Services Exchange option and implement the Register Document Set-b transaction shall support the following:

- Document Repository Actor shall support Asynchronous Web Services Exchange for the Provide & Register Document Set – b [ITI-41] and Register Document Set – b [ITI-42], and Retrieve Document Set [ITI-43] transactions
- Document Registry Actor shall support Asynchronous Web Services Exchange for the Registry Stored Query [ITI-18] and Register Document Set – b [ITI-42] transactions

Refer to section ITI TF-2x: V.5 Synchronous and Asynchronous Web Services Exchange for an explanation of Asynchronous Web Services Exchange.

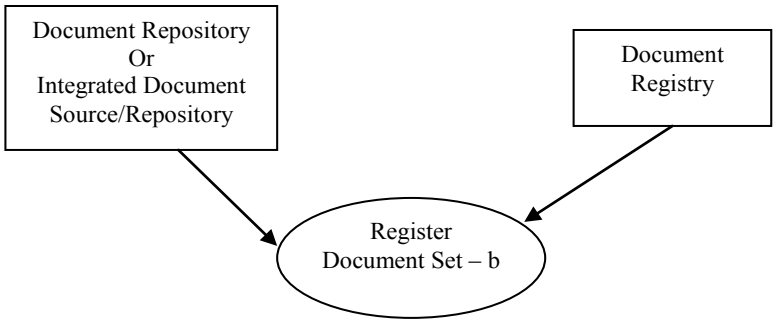
3.42.1 Scope

The Register Document Set-b transaction passes a Submission Request from a Document Repository actor to a Document Registry actor.

A Register Document Set-b transaction shall carry:

- Metadata describing zero or more documents
- XDS Submission Set definition along with the linkage to new documents and references to existing documents
- An optional XDS Folder definitions along with linkage to new or existing documents

3.42.2 Use Case Roles



Actor: Document Repository or Integrated Document Source/Repository

Role: A document storage system that submits document metadata to a Document Registry.

Actor: Document Registry

Role: A document indexing system that receives and stores document metadata.

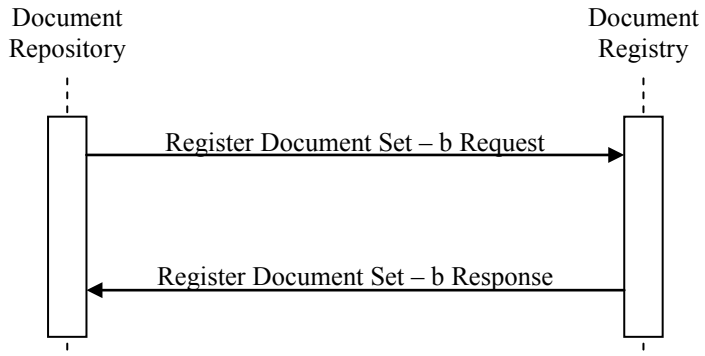
Note: Within this transaction, the Document Repository and Integrated Document Source/Repository actors can be used interchangeably

3.42.3 Referenced Standards

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
HL7V2	HL7 Version 2.5
Appendix V	ITI TF-2x:Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use

3.42.4 Interaction Diagram



3.42.4.1 Register Document Set-b Request

The Document Repository sends metadata for a set of documents to the Document Registry.

3.42.4.1.1 Trigger Events

The Register Document Set-b Request message is triggered when:

- A Document Repository wants to register metadata for a set of documents it holds. These documents may have been stored in the Document Repository by a Document Consumer (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 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.

The Registry actor shall store and later include in metadata returned in a query response the XDSDocumentEntry.repositoryUniqueId attribute along with other metadata attributes received in the Register Document Set-b [ITI-42] transaction as determined by profile and transaction requirements.

3.42.4.1.4 Expected Actions

Upon receipt of a Register Document Set-b Request message, the Document Registry with the aid of the Registry Adaptor shall do the following:

- Accept all valid SubmitObjectsRequests.
- Perform metadata validations
- Update the registry with the contained metadata
- Return a RegistryResponse message given the status of the operation.

If the registry rejects the metadata, then, the following shall occur:

- An error is returned
- The error status includes an error message
- The request is rolled back

3.42.4.1.4.1 Basic Patient Privacy Enforcement Option

If the Basic Patient Privacy Enforcement Option is implemented:

1. The Integrated Document Source / Repository actor shall populate the confidentialityCode in the document metadata with the list of values that identify the sensitivity classifications that apply to the associated document. The confidentiality codes for different documents in the same submission may be different.
2. The Integrated Document Source / Repository actor 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 XDS Affinity Domain Policy. The details of this are product specific and not specified by IHE.
3. The Integrated Document Source / Repository actor may have a 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. However, the information about how confidentiality codes are assigned must be part of the published policy for the XDS Affinity Domain. For example, when publishing a document, the Integrated Document Source / Repository might show a list of checkboxes where a user can select which of the available consents a document is to be published.

3.42.4.1.5 Protocol Requirements

The Register Document Set-b transaction shall use SOAP12. Furthermore:

- The Document Registry actor shall accept the Register Document Set-b Request formatted as a SIMPLE SOAP message and respond with the Register Document Set-b Response formatted as a SIMPLE SOAP message.
- The Document Repository actor shall generate the Register Document Set-b Request formatted as a SIMPLE SOAP message and accept the Register Document Set-b Response formatted as a SIMPLE SOAP message.

See ITI TF-2x: Appendix V for details.

3.42.4.2 Register Document Set-b Response

3.42.4.2.1 Trigger Events

The Document Registry 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 carry the status of the requested operation and an error message if the requested operation failed. The conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: 4.1.13 Error Reporting.

3.42.4.2.3 Expected Actions

The Document Repository now knows that the transaction succeeded/failed and can continue. The metadata added to the registry as a result of this transaction is now available for discovery.

3.42.5 Protocol Requirements

Implementors of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V: Web Services for IHE Transactions.

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 Registry: These are the requirements for the Register Document Set-b transaction presented in the order in which they would appear in the Document Registry WSDL definition:

- The following types shall be imported (xsd:import) in the /definitions/types section:
  - namespace="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0", schema=" rs.xsd"
  - namespace="urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0", schema=" lcm.xsd"
- The /definitions/message/part/@element attribute of the Register Document Set-b Request message shall be defined as “lcm:SubmitObjectsRequest”
- The /definitions/message/part/@element attribute of the Register Document Set-b Response message shall be defined as “rs:RegistryResponse”
- Refer to Table 3.42.5.b below for additional attribute requirements
- To support the Asynchronous Web Services Exchange option on the Document Repository, the Document Registry shall support the use of a non-anonymous response EPR in the WS-Addressing replyTo header.

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 ITI TF-2b: 3.42.5.1 Sample SOAP Messages.

For informative WSDL for the Document Registry actor see ITI TF-2x: Appendix W.

Table 3.42.5.b Additional Attribute Requirements

Attribute	Value
/definitions/portType/operation@name	DocumentRepository _RegisterDocumentSet-b
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2007:RegisterDocumentSet-b
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2007: ProvideAndRegisterDocumentSet-bResponse
/definitions/binding/operation/soap12:operation/@soapAction	urn:ihe:iti:2007: RegisterDocumentSet-b

3.42.5.1 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/>, <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.

Samples presented in this section are also available online on the IHE FTP site, see ITI TF-2x: Appendix W.

3.42.5.1.1 Sample Register Document Set-b SOAP Request

3.42.5.1.1.1 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:RegisterDocumentSet-b</a:Action>
    <a:MessageID>urn:uuid:1ec52e14-4aad-4ba1-b7d3-fc9812a21340</a:MessageID>
    <a:ReplyTo>
      <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
    </a:ReplyTo s:mustUnderstand="1">
    <a:To >http://localhost:2647/XdsService/IHEXDSRegistry.svc</a:To>
  </s:Header>
  <s:Body>
    <lcm:SubmitObjectsRequest
       xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm: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">

      <!—Rest of SubmitObjectsRequest message goes here -->

    </lcm:SubmitObjectsRequest>
  </s:Body>
</s:Envelope>
```

3.42.5.1.1.2 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:RegisterDocumentSet-b</a:Action>
              <a:MessageID>urn:uuid:1ec52e14-4aad-4ba1-b7d3-fc9812a21340</a:MessageID>
              <a:ReplyTo>
                     <a:Address>
http://192.168.2.4:9080/XdsService/DocumentRepositoryReceiver.svc</a:Address>
              </a:ReplyTo>
              <a:To
s:mustUnderstand="1">http://localhost:2647/XdsService/Document**Registry**Receiver.svc</a:To>
       </s:Header>
       <s:Body>
              <lcm:SubmitObjectsRequest
                            xmlns:lcm="urn:oasis:names:tc:ebxml-regrep:xsd:lcm: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">

                     <!—Rest of SubmitObjectsRequest message goes here -->

              </lcm:SubmitObjectsRequest>
       </s:Body>
</s:Envelope>
```


3.42.5.1.2 Sample Register Document Set-b SOAP Response

3.42.5.1.2.1 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:RegisterDocumentSet-bResponse</a:Action>
   <a:RelatesTo>urn:uuid:1ec52e14-4aad-4ba1-b7d3-fc9812a21340</a:RelatesTo>
  </s:Header>
  <s:Body>
   <rs:RegistryResponse
   status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"
   xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"/>
  </s:Body>
</s:Envelope>
```

3.42.5.1.2.2 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:RegisterDocumentSet-
bResponse</a:Action>
               <a:MessageID>urn:uuid:D6C21225-8E7B-454E-9750-821622C099DB</a:MessageID>
               <a:RelatesTo>urn:uuid:1ec52e14-4aad-4ba1-b7d3-fc9812a21340</a:RelatesTo>
               <a:To
s:mustUnderstand="1">http://localhost:2647/XdsService/DocumentRepositoryReceiver.svc</a:To>
       </s:Header>
       <s:Body>
               <rs:RegistryResponse
               status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success"
               xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"/>
       </s:Body>
</s:Envelope>
```

3.42.6 Actor Requirements

The Document Repository actor shall:

- Make (all) the new document(s) included in the XDS Submission Set available for retrieval via the Retrieve Document Set transaction before it initiates the Register Document Set-b Request message with the Registry actor.

This is necessary because:

- The Document Registry actor may choose to validate the successful storage of the document(s) before acknowledging the Register Document Set-b Request transaction.
- The Document Consumer actor may retrieve the document(s) before the Register Document Set-b Response is received by the Document Repository actor.

3.42.7 Security Considerations

Relevant XDS Affinity Domain Security background is discussed in the XDS Security Considerations Section (see ITI TF-1: 10.7).

3.42.7.1 Audit Record Considerations

The Register Document Set-b Transaction is PHI-Export event, as defined in ITI TF-2a: Table 3.20.6-1. The Actors involved in the transaction shall create audit data in conformance with DICOM (Supp 95) "Data Export", with the following exceptions.

3.42.7.1.1 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)			
Patient (1)			
SubmissionSet (1)			

Where:

Source **AuditMessage/ ActiveParticipant**	UserID	U	*When WS-Addressing is used: <ReplyTo/>*
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.
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	*NA*	
	NetworkAccessPointID	*NA*	

Destination	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, as specified in RFC 3881.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **(AudittMessage/ 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*

3.42.7.1.2 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-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 (1)			
SubmissionSet (1)			

Where:

Source **AuditMessage/ ActiveParticipant**	UserID	*U*	*When WS-Addressing is used this should be the value of the <ReplyTo/> element.*
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.

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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, as specified in RFC 3881.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **(AudittMessage/ 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

This section corresponds to Transaction ITI-43 of the IHE Technical Framework. The Document Consumer, Document Repository and Initiating Gateway actors use transaction ITI-43.

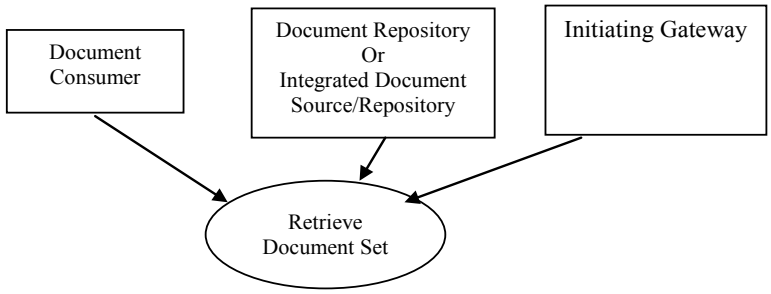
Integration Profiles using this Transaction
Cross-Enterprise Document Sharing-b (XDS.b)
Cross-Community Access (XCA)

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 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



XDS Actors:

Actor: Document Consumer

Role: Obtains document.

Actor: Document Repository or Integrated Document Source/Repository

Role: Provides documents.

XCA Actors:

Actor: Initiating Gateway

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.

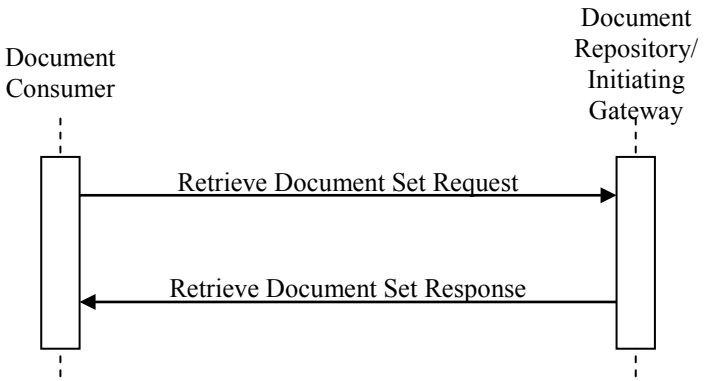
Note: Within this transaction, the Document Repository and Integrated Document Source/Repository actors can be used interchangeably.

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
Appendix V	ITI TF-2x:Appendix V Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use
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/

3.43.4 Interaction Diagram



3.43.4.1 Retrieve Document Set Request

3.43.4.1.1Trigger 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 XCA supplement 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 profile. 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 actor shall abide by the XDS Affinity Domain Policies represented by the confidentialityCode in the metadata associated with the document. The Document Consumer actor 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 actor 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

3.43.4.2.3 Expected Actions

A Document Repository shall retrieve 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 retrieved. The conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: 4.1.13 Error Reporting.

3.43.5 Protocol Requirements

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 for details. The Document Repository shall:

- 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.

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:

- 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”
- 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.

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/@wsa w:Action	urn:ihe:iti:2007: RetrieveDocumentSetResp onse
/definitions/binding/operation/soap12:operati on/@soapAction	urn:ihe:iti:2007: RetrieveDocumentSet

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 ITI TF-2b: 3.43.5.1 Sample SOAP Messages.

For informative WSDL for the Document Repository actor see in 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:
    - 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.
    - 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:

- 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 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.
    - 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.
    - 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.
    - A required <ihe:Document/> element that contains the retrieved document in base64binary encoded format
    - A required <ihe:mimeType/> element that indicates the MIME type of the retrieved document

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
```

See ITI TF-3: 4.1.13 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:
  - @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
- 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:
  - @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 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 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.

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/>, <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

```
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>";
    start-info="application/soap+xml"
User-Agent: Axis2
Host: ihexds.nist.gov:5000

--MIMEBoundaryurn_uuid_3448B7F8EA6E8B9DFC1289514997517
Content-Type: application/xop+xml; charset=UTF-8;
    type="application/soap+xml"
Content-Transfer-Encoding: binary
Content-ID: <0.urn:uuid:3448B7F8EA6E8B9DFC1289514997518@apache.org>

<?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>
        <wsa:MessageID soapenv:mustUnderstand="1"
            >urn:uuid:3448B7F8EA6E8B9DFC1289514997508</wsa:MessageID>
        <wsa:Action soapenv:mustUnderstand="1"
            >urn:ihe:iti:2007:RetrieveDocumentSet</wsa:Action>
    </soapenv:Header>
    <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>
            </DocumentRequest>
        </RetrieveDocumentSetRequest>
    </soapenv:Body>
</soapenv:Envelope>
--MIMEBoundaryurn_uuid_3448B7F8EA6E8B9DFC1289514997517--
```

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

```
<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:RetrieveDocumentSet</a:Action>
               <a:MessageID>urn:uuid:0fbfdced-6c01-4d09-a110-2201afedaa02</a:MessageID>
               <a:ReplyTo>
```



```
                        <a:Address>
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>
        </s:Header>
        <s:Body>
                <RetrieveDocumentSetRequest xmlns="urn:ihe:iti:xds-b:2007">
                        <DocumentRequest>
                                <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>
                        </DocumentRequest>
                </RetrieveDocumentSetRequest>
        </s:Body>
</s:Envelope>
```

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.

```
HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Content-Type: multipart/related;
    boundary=MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310;
    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

--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>

<?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"
             >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">
          <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>
                <xdsb:DocumentUniqueId
                  >1.42.20101110141555.15</xdsb:DocumentUniqueId>
                <xdsb:mimeType>text/plain</xdsb:mimeType>
                <xdsb:Document>
                    <xop:Include
```



```
                    href="cid:1.urn:uuid:E910375860336E2B8F1289514978312@apache.org"
                        xmlns:xop="http://www.w3.org/2004/08/xop/include"/>
                </xdsb:Document>
            </xdsb:DocumentResponse>
        </xdsb:RetrieveDocumentSetResponse>
    </soapenv:Body>
</soapenv:Envelope>

--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.
--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.

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:

```
HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Content-Type: multipart/related;
    boundary=MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310;
    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

--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>

<?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"
             >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">
          <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>
                <xdsb:DocumentUniqueId
                  >1.42.20101110141555.15</xdsb:DocumentUniqueId>
                <xdsb:mimeType>text/plain</xdsb:mimeType>
                <xdsb:Document>
```



```
                    Base64 encoded contents of document go here
                </xdsb:Document>
            </xdsb:DocumentResponse>
        </xdsb:RetrieveDocumentSetResponse>
    </soapenv:Body>
</soapenv:Envelope>
--MIMEBoundaryurn_uuid_E910375860336E2B8F1289514978310--
```

3.43.5.1.2.2 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:RetrieveDocumentSetResponse</a:Action>
              <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/XdsService/DocumentConsumerReceiver.svc</a:To>
       </s:Header>
       <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"
                            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>
                            <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                            <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                            <mimeType>text/xml</mimeType>

       <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
                     </DocumentResponse>
                     <DocumentResponse>
                            <RepositoryUniqueId>1.3.6.1.4...1000</RepositoryUniqueId>
                            <DocumentUniqueId>1.3.6.1.4...2300</DocumentUniqueId>
                            <mimeType>text/xml</mimeType>

       <Document>UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi</Document>
                     </DocumentResponse>
              </RetrieveDocumentSetResponse>
       </s:Body>
</s:Envelope>
```

3.43.6 Security Considerations

Relevant XDS Affinity Domain Security background is discussed in the XDS Security Considerations Section (see ITI TF-1: 10.7).

3.43.6.1 Audit Record Considerations

The Retrieve Document Set Transaction is PHI-Export event, as defined in ITI TF-2a: Table 3.20.6-1. The Actors involved in the transaction shall create audit data in conformance with DICOM (Supp 95) “Data Export”/”Data Import”, with the following exceptions.

The Repository Actor 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 difference is considered insignificant.

The Document Consumer Actor 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.

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:

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, as specified in RFC 3881.

Destination **AuditMessage/ ActiveParticipant**	UserID	M	The content of the <wsa:ReplyTo/> element.
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.
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	*NA*	
	NetworkAccessPointID	*NA*	

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient (if-known) **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"2" (System)
	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(9, RFC-3881, "Report Number")
	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 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, as specified in RFC 3881.

Destination **AuditMessage/ ActiveParticipant**	UserID	M	The content of the <wsa:ReplyTo/> element.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Document	ParticipantObjectTypeCode	M	"2" (System)

	ParticipantObjectTypeCodeRole	M	"3" (report)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(9, RFC-3881, "Report Number")
	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*

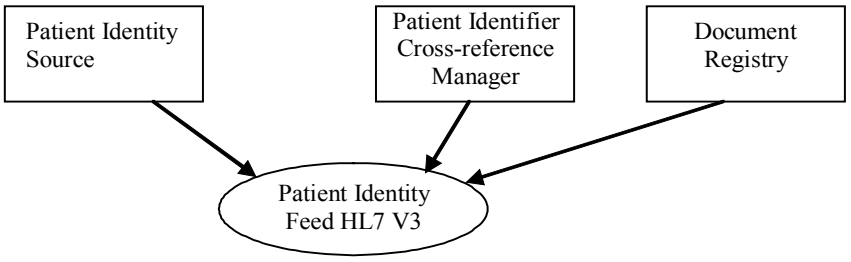
3.44 Patient Identity Feed HL7 V3

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

The scope is identical to ITI TF-2a: 3.8.1.

3.44.2 Use Case Roles



Actor: Patient Identity Source

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

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)

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:

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

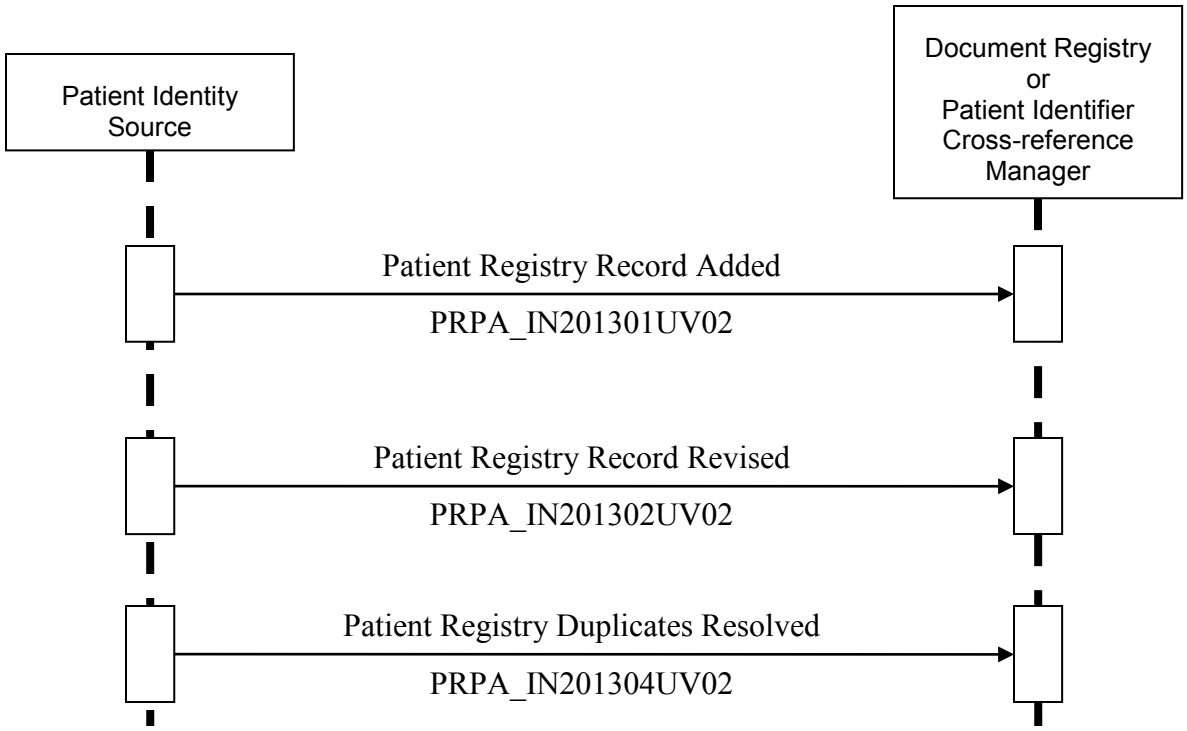


Figure 3.44-1 Patient Identity Sequence

3.44.4.1 Patient Identity Management – Add or Revise Patient Record

3.44.4.1.1 Trigger Events

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:

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 Actor 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 ITI TF-2b: 3.44.4.1.2.2.describes the relevant data elements for this transaction. Specific requirements for the particular actors are found in ITI TF-2b: 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

This is used for sending information pertaining to the mother's maiden name.

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

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 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 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 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 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 Revise messages (it is optional in the original Revise message definition).

The following roles are omitted:

asPatientOfOtherProvider

guarantor

guardian

contactParty

asMember

careGiver

asStudent

The following participations are omitted:

subjectOf (administrativeObservation)

coveredPartyOf (coverage)

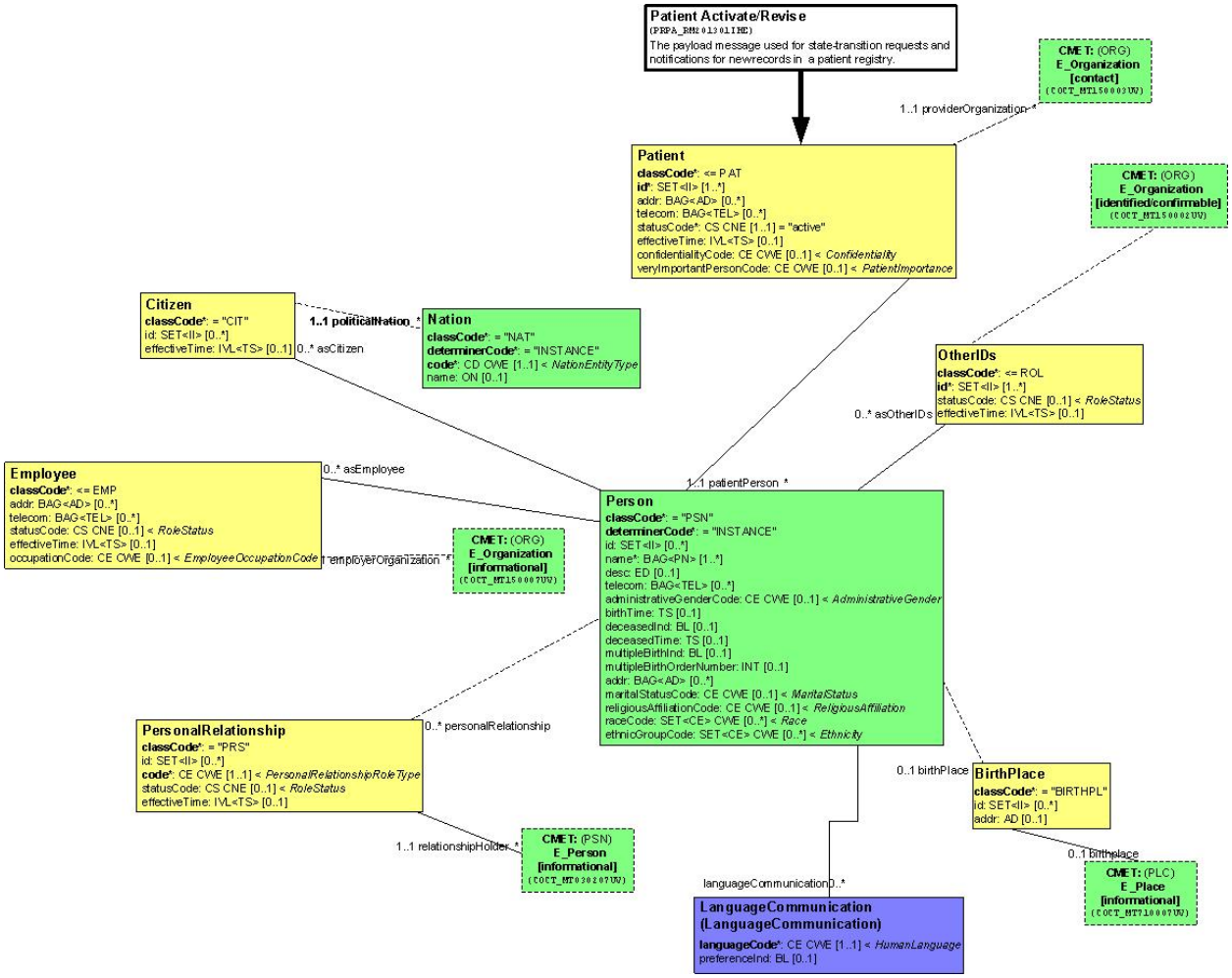


Figure 3.44.4.1.2-1

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

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..*]	Value(s) that control the disclosure of information about this living

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 (SET<CE>) {CWE:Confidentiality}	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] 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

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)
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) 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]	A non-unique textual identifier or moniker for this nation

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 (ON)	
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..*] place (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

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.

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

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"
```

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 -->
<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"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/MCCI_IN000002UV01.xsd"/>
<xsd:element name="MCCI_IN000002UV01"/>
</xsd:schema>
  </types>
…
```

The messages are described by the following snippet:

```
      …
<message name="PRPA_IN201301UV02_Message">
<part element="hl7:PRPA_IN201301UV02" name="Body"/>
  </message>
  <message name="PRPA_IN201302UV02_Message">
<part element="hl7:PRPA_IN201302UV02" name="Body"/>
  </message>
  <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 with the expected actions of the actors which receive these messages in sections ITI TF-2b: 3.44.4.1.3 and TF-2b: 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 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 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 transaction (see ITI TF-2b: 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":
"add" message    -> "PRPA_IN201301UV02_Message"
"revise" message -> "PRPA_IN201302UV02_Message"
acknowledgement  -> "MCCI_IN000002UV01_Message"
portType         -> "PIXManager_PortType"
add operation    -> "PIXManager_PRPA_IN201301UV02"
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 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">
<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>
<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"/>
</operation>
  </portType>
```

3.44.4.1.3.1.2 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_IN201301UV02">
      <wsoap12:operation soapAction="urn:hl7-org:v3:PRPA_IN201301UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </operation>
    <operation name="PIXManager_PRPA_IN201302UV02">
      <wsoap12:operation soapAction="urn:hl7-org:v3:PRPA_IN201302UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
```



```
        <wsoap12:body use="literal"/>
      </output>
    </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.

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 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 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":
"add" message    -> "PRPA_IN201301UV02_Message"
"revise" message -> "PRPA_IN201302UV02_Message"
acknowledgement  -> "MCCI_IN000002UV01_Message"
portType         -> "DocumentRegistry_PortType"
add operation    -> "DocumentRegistry_PRPA_IN201301UV02"
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.

3.44.4.1.3.1.1 Port Type

```
  <portType name="DocumentRegistry_PortType">
      <operation name="DocumentRegistry_PRPA_IN201301UV02">
<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>
```



```
<operation name="DocumentRegistry_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>
```

3.44.4.1.3.1.2 Bindings

SOAP 1.2 binding:

```
…
  <binding name="DocumentRegistry_Binding_Soap12"
type="DocumentRegistry_PortType">
    <wsoap12:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>
    <operation name="DocumentRegistry_PRPA_IN201301UV02">
<wsoap12:operation soapAction="urn:hl7-org:v3:PRPA_IN201301UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </operation>
    <operation name="DocumentRegistry_PRPA_IN201302UV02">
      <wsoap12:operation soapAction="urn:hl7-org:v3:PRPA_IN201302UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </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.

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.

3.44.4.2 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 ITI TF-2b: 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 ITI TF-2b: 3.44.4.2.2.2 describes the relevant data elements for this transaction. Specific requirements for the particular actors are found in ITI TF-2b: 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.

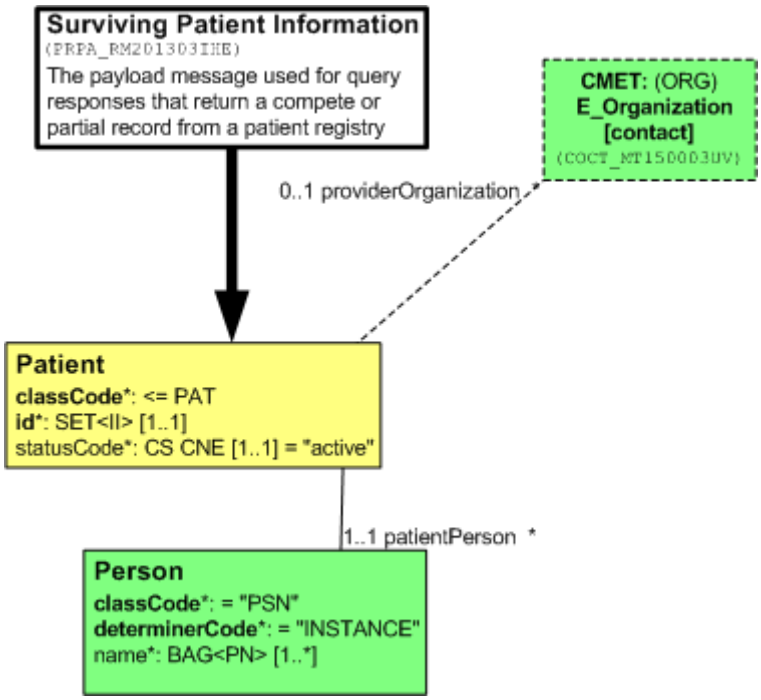


Figure 3.44.4.2.2-1

The attributes of this model are described in the following table.

Table 3.44.4.2.2-1

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

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.

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).

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"
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 -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201304UV02.xs
d"/>
<xsd:element name="PRPA_IN201304UV02"/>
</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/MCCI_IN000002UV01.xs
d"/>
<xsd:element name="MCCI_IN000002UV01"/>
</xsd:schema>
  </types>
…
```

The messages are described by the following snippet:

```
      …
  <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"/>
  </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 ITI TF-2b: 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

```
  <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>
```

3.44.4.2.3.1.2 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_IN201304UV02">
      <wsoap12:operation soapAction="urn:hl7-org:v3:PRPA_IN201304UV02"/>
```



```
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </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.

3.44.4.2.3.2 Message Examples

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.

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.

See ITI TF-2a: 3.18.4.1.2.3.8.1 of the Technical Framework for details of how this message type affects results of a Stored Query transaction and the end of ITI TF-2a: 3.14.4.1.2.12 to see how it affects the Register 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 Register Document Set [ITI-14] transactions. See ITI TF-2a: 3.14.4.1.2.12 XDS Registry Adaptor for details.
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.
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.
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 transaction [ITI-18] and the Register Document Set transaction [ITI-14].

3.44.4.2.4.1 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":
"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"
```


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>
```

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"/>
    <operation name="DocumentRegistry_PRPA_IN201304UV02">
<wsoap12:operation soapAction="urn:hl7-org:v3:PRPA_IN201304UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </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.

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.

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 IHE Audit Trail and Node Authentication Integration profile. This use of the ATNA profile in an XDS Affinity Domain does not require a centralized XDS Affinity Domain Audit Record Repository.

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 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.

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.

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 table 3.20.6-1. The following tables show items that are required to be part of the audit record for this transaction.

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	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.
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	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	*NA*	
	NetworkAccessPointID	*NA*	

Destination **AuditMessage/ ActiveParticipant**	UserID	M	SOAP endpoint URI.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.

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

Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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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3.44.5.1.2 Patient Identifier Cross-reference Manager audit message

	Field Name	Opt	Value Constraints
Event	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/ ActiveParticipant**	UserID	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.

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, as specified in RFC 3881.

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

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Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 ITI TF-2b: 3.44.5.1.2

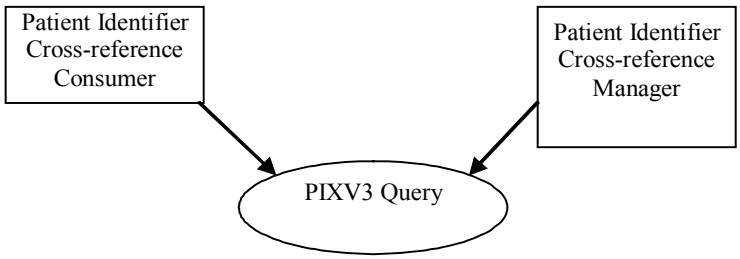
3.45 PIXV3 Query

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.

3.45.1 Scope

The scope is identical to ITI TF-2a: 3.9.1, PIX Query Scope.

3.45.2 Use Case Roles



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)

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:

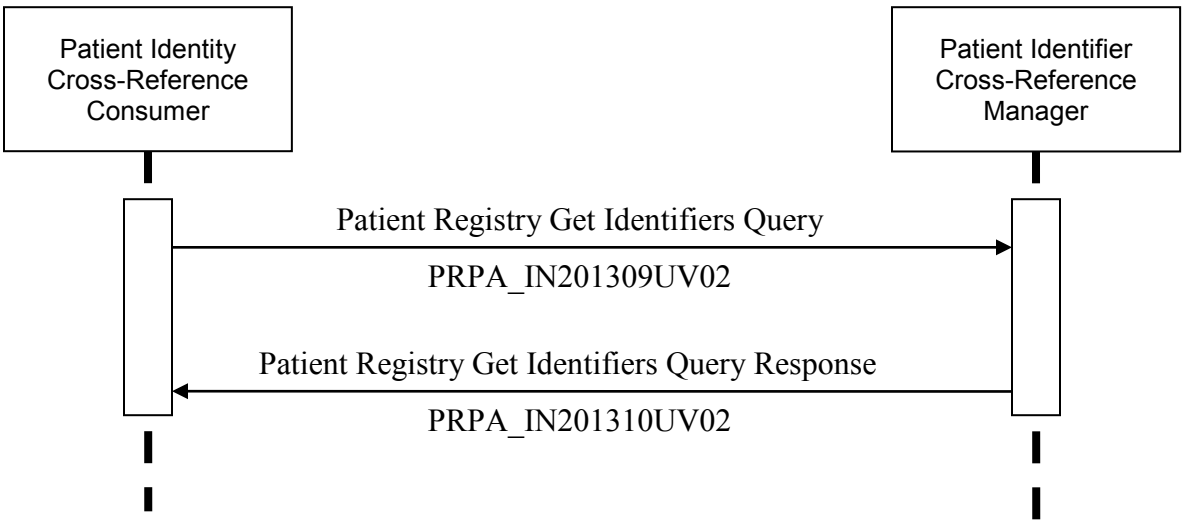
Patient Registry Query Fulfiller (PRPA_AR201304UV02)

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.

3.45.4 Interaction Diagrams



3.9B-1 Get Corresponding Identifiers Sequence

3.45.4.1 Get Corresponding Identifiers

3.45.4.1.1 Trigger Events

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.

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 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 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 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".

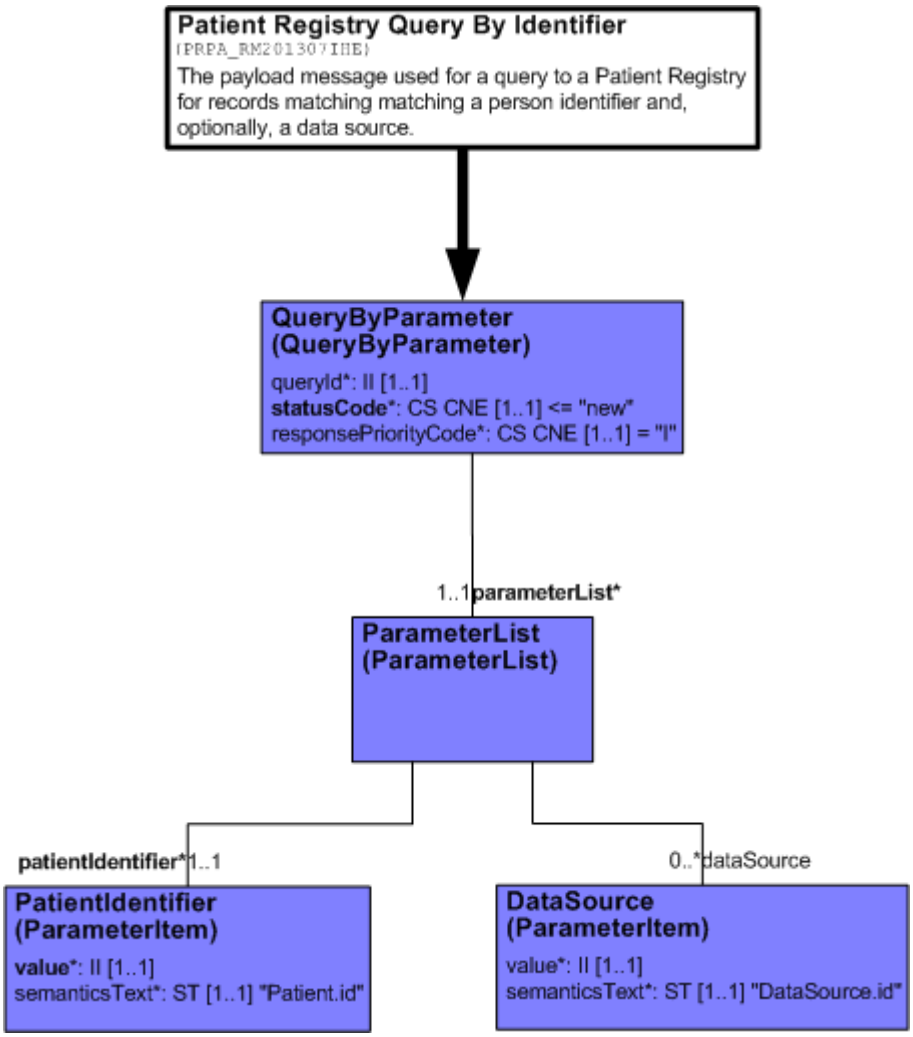


Figure 3.45.4.1.2-1

The attributes of this model are described in the following table.

Table 3.45.4.1.2-2

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.
DataSource	Optional parameter specifying the assigning authority of a Patient

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)
	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"}	

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 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 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

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

Transmission Wrapper	Trigger Event Control Act Wrapper
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_TE201309UV02 The value of authroOrPerformer.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 are at Edition2008/processable/multicacheschemas/PRPA_IN201309UV02.xsd).

3.45.4.1.2.4 Web Services Types and Messages

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"
```

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>
```


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 sections ITI TF-2b: 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.

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".

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"
```

The following WSDL snippets specify the PIXV3 Query Port Type and Binding definitions, according to the requirements specified in ITI TF-2x: Appendix V.

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>
```

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 soapAction="urn:hl7-org:v3:PRPA_IN201309UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
```



```
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </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.

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

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

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 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

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 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 optionally be used to capture other identifiers associated with the person such as a 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, 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

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 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

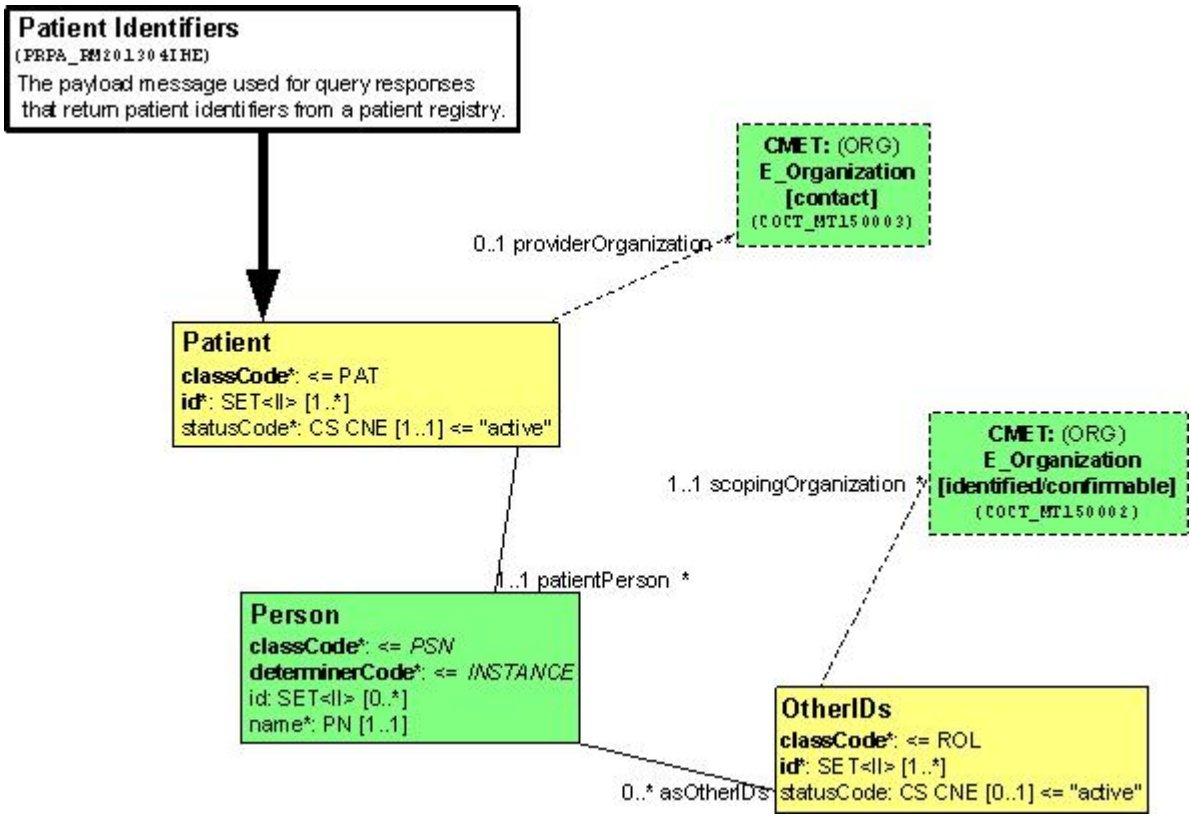


Figure 3.45.4.2.2-1

The attributes of this model are described in the following table.

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Table 3.45.4.2.2-3

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
determinerCode [1..1] (M)	Structural attribute; this is a specific person

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)
Person (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	
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.

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 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 ITI TF-2b: 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

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 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 Appendix E for a detailed description of the use of the II data type for patient identifiers.

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 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. 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:

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 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 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

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).

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 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).

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).

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.

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
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 ITI TF-2b: 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 table 3.20.6-1. 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	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.
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	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	*NA*	
	NetworkAccessPointID	*NA*	

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, as specified in RFC 3881.

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

Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **(AudittMessage/ ParticipantObjectIdentification)**	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

3.45.5.1.2 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	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.

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, as specified in RFC 3881.

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

Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **(AudittMessage/ ParticipantObjectIdentification)**	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

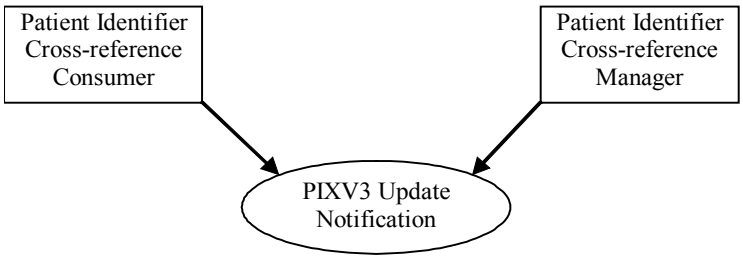
3.46 PIXV3 Update Notification

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 section 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:

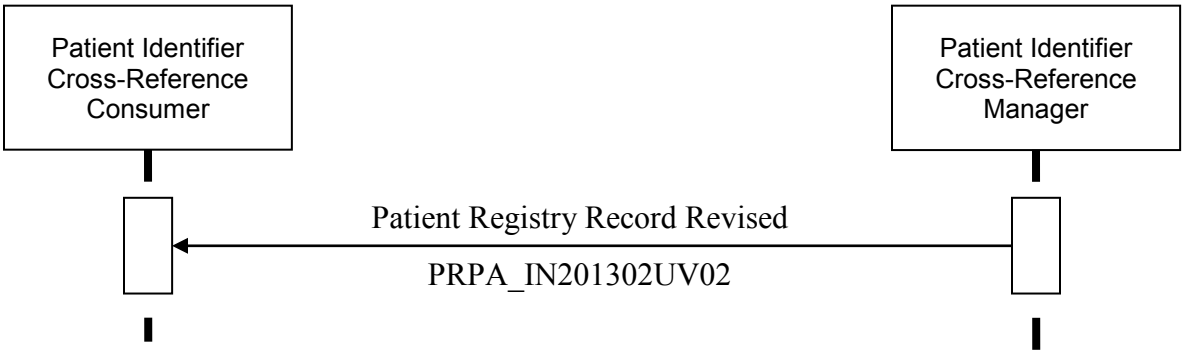
Patient Registry Tracker (PRPA_AR201302UV02)

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



3.46-1 Update Patient Information Sequence

3.46.4.1 Update Patient Information

3.46.4.1.1 Trigger Events

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.

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)

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.

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 profile. 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

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 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 such as a 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, 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 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 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 ITI TF-2b: 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 identifiers

All optional attributes in the Patient and Person class are removed

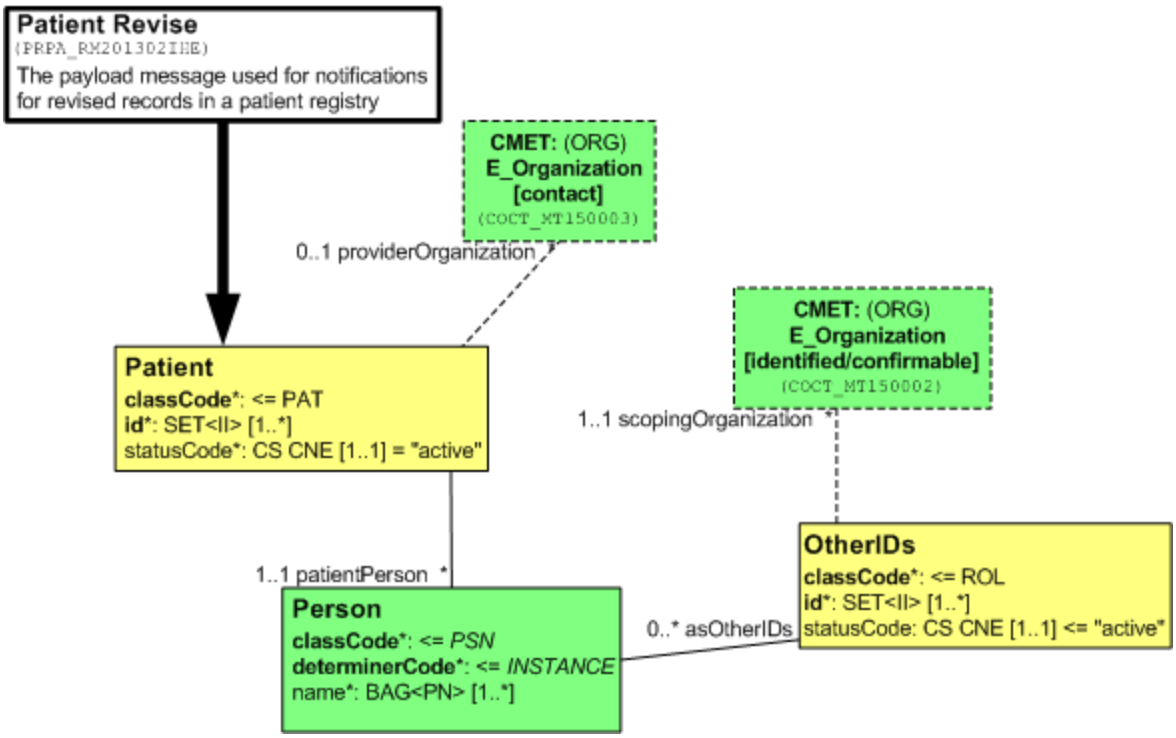


Figure 3.46.4.1.2-1

The attributes of this model are described in the following table.

Table 3.46.4.1.2-4

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)	Structural attribute; this is a "person" entity

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)
Person (CS) {CNE:PSN, fixed value= "PSN"}	
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)

3.46.4.1.2.3 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 -->
<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"
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"/>
<xsd:element name="MCCI_IN000002UV01"/>
</xsd:schema>
  </types>
…
```

The messages are described by the following snippet:

```
      …
  <message name="PRPA_IN201302UV02_Message">
<part element="hl7:PRPA_IN201302UV02" name="Body"/>
  </message>
  <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 with the expected actions of the actors which receive these messages in section ITI TF-2b: 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"
```

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

```
 <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:

```
…
  <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 soapAction="urn:hl7-org:v3:PRPA_IN201302UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </operation>
  </binding>
…
```

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

No transaction specific security considerations.

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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 table 3.20.6-1. The following tables show items that are required to be part of the audit record for this transaction.

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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:

Source **AuditMessage/ ActiveParticipant**	UserID	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.
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	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	*NA*	
	NetworkAccessPointID	*NA*	

Destination	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, as specified in RFC 3881.

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

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Patient IDs **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **AuditMessage/ EventIdentification**	EventID	M	EV(110110, DCM, "Patient Record")
	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)			

Where:

Source **AuditMessage/ ActiveParticipant**	UserID	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.

Destination	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, as specified in RFC 3881.

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

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Patient IDs **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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

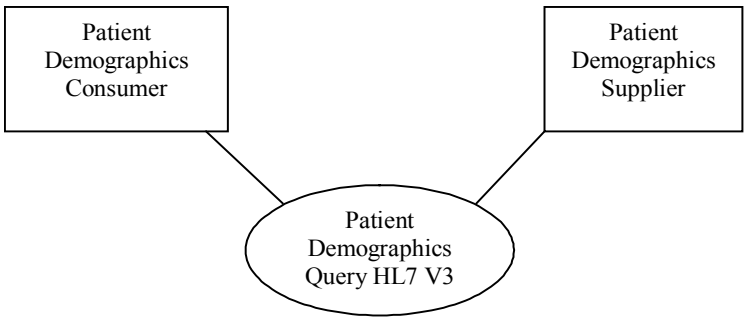
3.47 Patient Demographics Query HL7 V3

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 are also indicated in ITI TF-2b: 640 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



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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:

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:

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: Appendix V Web Services for IHE Transactions.

3.47.4 Interaction Diagrams

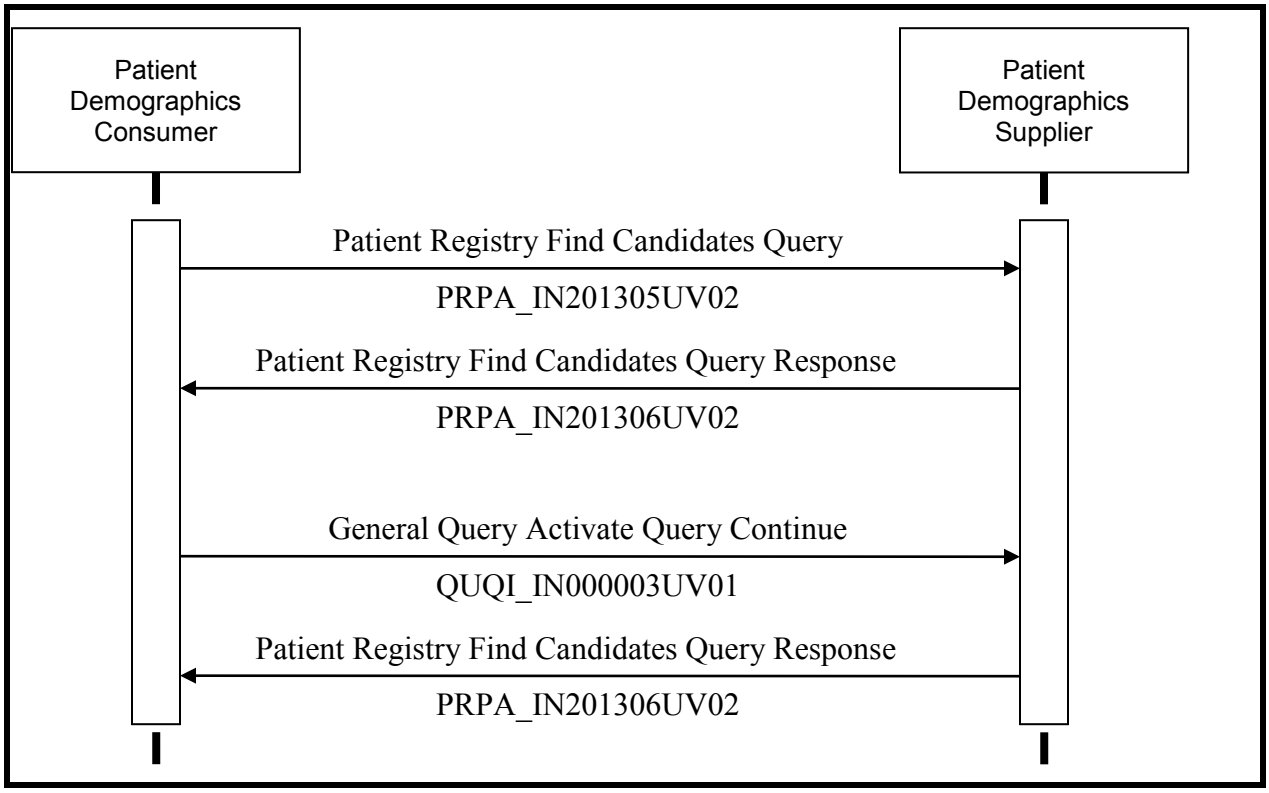


Figure 3.46.4-1 Find Candidates Query

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:

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

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.

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 ITI TF-2b: 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 ITI TF-2b: 3.47.4.1.2.1 to 3.47.4.1.2.4.

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.

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 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 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

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 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 multiple instances of this parameter are provided in the query, all of the associated identifiers must match. The identifier specified in the LivingSubjectId.value attribute is expressed using the II data type. Please see 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 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.

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 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 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 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

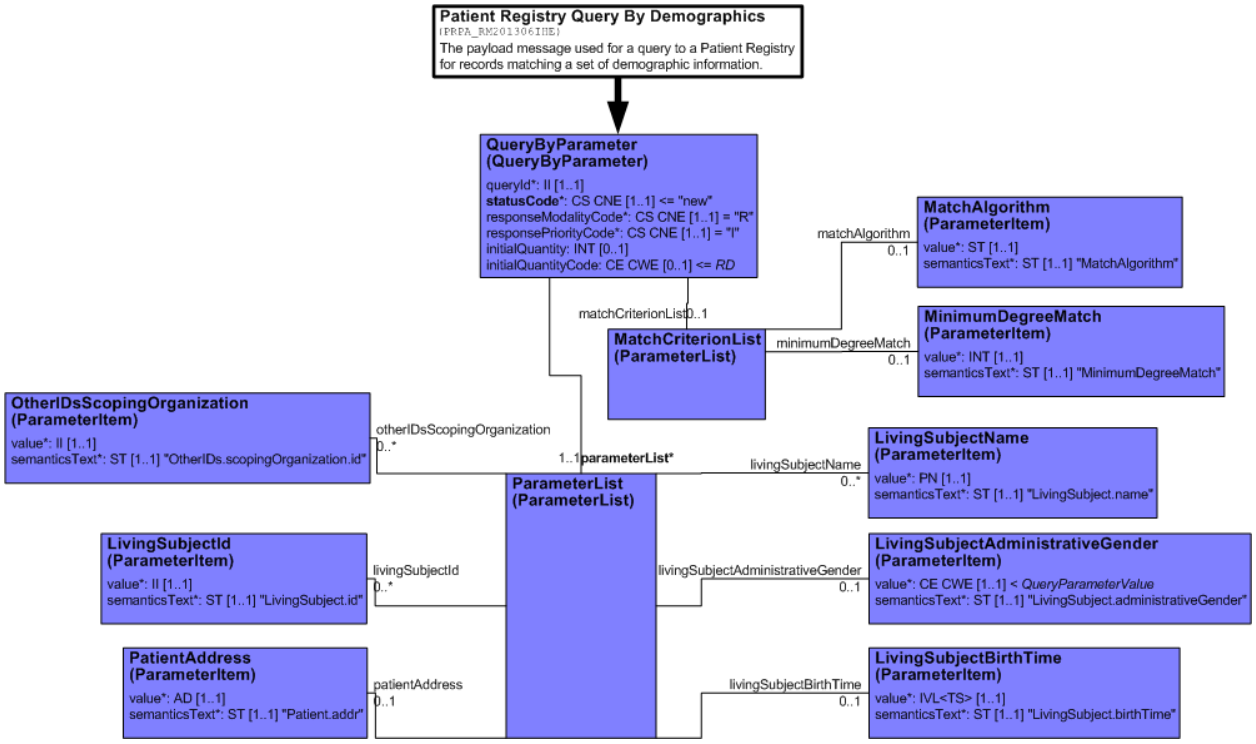
This optional parameter specifies the primary telephone number or email address of the person whose information is being queried.

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



5340 **Figure 3.47.4.1.2-1**

The attributes of this model are described in the following table:

Table 3.47.4.1.2-1

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

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)
	patient
value [1..1] ParameterItem (AD)	
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"}	

When Patient 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.
value [1..1] ParameterItem (TEL)	Design Comments: A telecommunications address. The scheme attribute specifies whether this is a telephone number, fax number, email address, etc.

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.

Table 3.47.4.1.2-7 Wrappers and Constraints

Transmission Wrapper	Trigger Event Control Act Wrapper

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 authroOrPerformer.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 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.

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>
…
```

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 ITI TF-2b: 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 ITI TF-2b: 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 ITI TF-2b: 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 ITI TF-2b: 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.

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 shown below) are required, and the detailed description of the message is provided in ITI TF-2b: 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 described in ITI TF-2b: 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.

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 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
- The relationship holder of the personal relationship is restricted to be a person (using CMET COCT_MT030207UV)
- The following roles are omitted:
    - asPatientOfOtherProvider
    - birthPlace
    - guarantor
    - guardian
    - contactParty
    - asMember

- careGiver
- asStudent

- The following participations are omitted:
  - subjectOf (administrativeObservation)
  - coveredPartyOf (coverage)

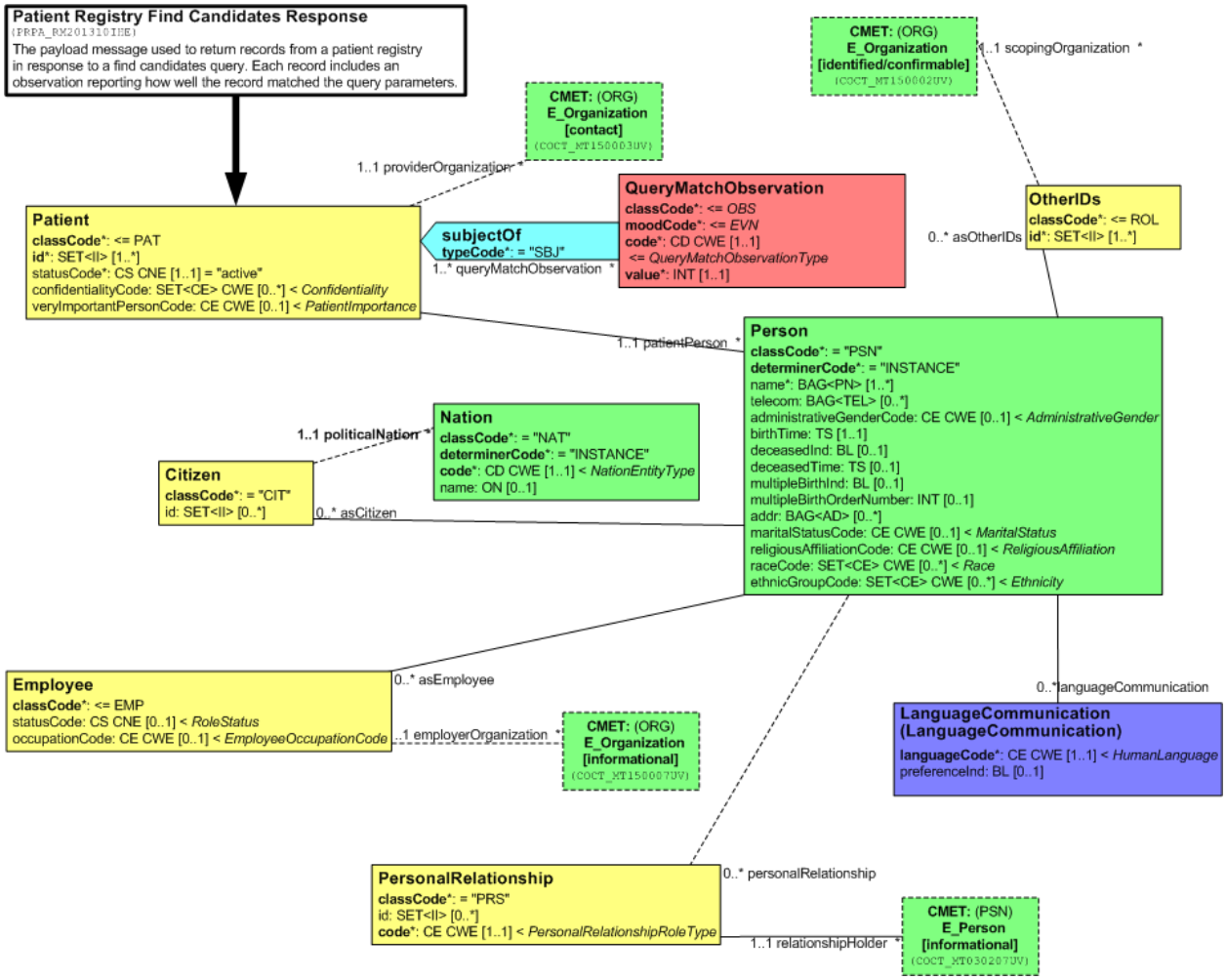


Figure 3.47.4.2.2-1

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 3.47.4.2.2-8

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)

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
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

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)
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
determinerCode [1..1] (M) Organization (CS) {CNE:INSTANCE, fixed value= "INSTANCE"}	Structural attribute; this is a specific entity
code [1..1] (M)	A value that identifies a nation state

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)
Organization (CD) {CWE:NationEntityType}	
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:, default= "OBS"}	Structural attribute – this is an observation
moodCode [1..1] (M) Observation (CS) {CNE:, 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.

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)
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 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 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:

```
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"
xmlns:hl7="urn:hl7-org:v3">
<!-- Include the message schema -->
<xsd:import namespace="urn:hl7-org:v3"
schemaLocation="../schema/HL7V3/NE2008/multicacheschemas/PRPA_IN201306UV02.xs
d"/>
<xsd:element name="PRPA_IN201306UV02"/>
</xsd:schema>
  </types>
…
```

The message is described by the following snippet:

```
…
```



```
  <message name="PRPA_IN201306UV02_Message">
<part element="hl7:PRPA_IN201306UV02" name="Body"/>
  </message>
      …
```

3.47.4.2.3 Expected Actions

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.

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.

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 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 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 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 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.

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).

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.

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 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 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 (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 *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)

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>
```

3.47.4.2.3.1.2 Bindings

SOAP 1.2 binding:

…


```
  <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 soapAction="urn:hl7-org:v3:PRPA_IN201305UV02"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </operation>
    <operation name="PDSupplier_QUQI_IN000003UV01_Continue">
      <wsoap12:operation soapAction="urn:hl7-
org:v3:QUQI_IN000003UV01_Continue"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </operation>
    <operation name="PDSupplier_QUQI_IN000003UV01_Cancel">
      <wsoap12:operation soapAction="urn:hl7-org:v3:
QUQI_IN000003UV01_Cancel"/>
      <input>
        <wsoap12:body use="literal"/>
      </input>
      <output>
        <wsoap12:body use="literal"/>
      </output>
    </operation>
  </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
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 trigger event code in ControlActProcess.code SHALL be set to PRPA_TE000003UV01 QueryContinuation.queryId SHALL be set to the original query identifier

the immediately preceding Query response message	

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 ITI TF-2b: 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 Actor 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 ITI TF-2b: 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 table 3.20.6-1. The following tables show items that are required to be part of the audit record for this transaction.

3.47.5.1.1 Patient Demographics Consumer audit message:

	Field Name	Opt	Value Constraints
Event	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	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.
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	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	*NA*	
	NetworkAccessPointID	*NA*	

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, as specified in RFC 3881.

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

Patient	ParticipantObjectTypeCode	M	"1" (Person)

	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 (AudittMessage/ ParticipantObjectIdentification)	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

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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)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	the content of the <wsa:ReplyTo/> element
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	*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, as specified in RFC 3881.

Destination	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, as specified in RFC 3881.

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

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Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **(AudittMessage/ ParticipantObjectIdentification)**	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 Intentionally Left Blank

3.49 Intentionally Left Blank

3.50 Intentionally Left Blank

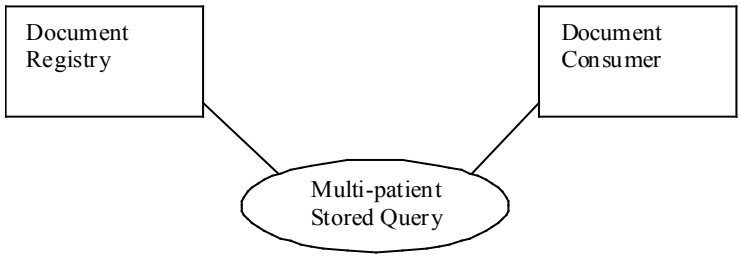
5770 ## 3.51 Multi-Patient Stored Query

This section corresponds to Transaction ITI-51 of the IHE Technical Framework. Transaction 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 transaction [ITI-18]. The main difference is the set of queries, which is specified in this transaction.

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

Actor: Document Registry

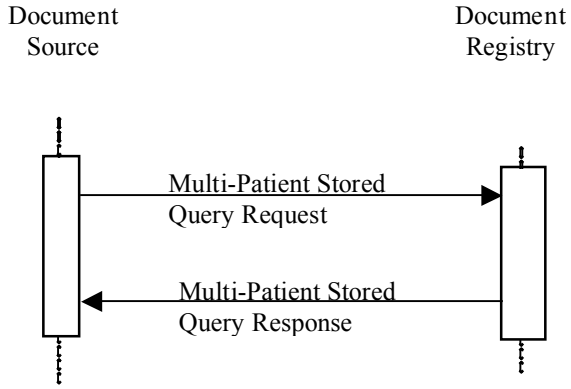
Role: Responds to a Multi-Patient Stored Query by providing the metadata or object references of registry objects which satisfy the query parameters

3.51.3 Referenced Standard

Implementers of this transaction shall comply with all requirements described in ITI TF-2x: Appendix V Web Services for IHE Transactions.

ebRIM	OASIS ebXML Registry Information Model v3.0
ebRS	OASIS ebXML Registry Services Specifications v3.0
ITI-18	ITI TF-2a: 3.18: Registry Stored Query
Appendix V	ITI TF-2x: Appendix V: Web Services for IHE Transactions Contains references to all Web Services standards and requirements of use

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:

- 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).

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 Source and Document Registry actors that support the Asynchronous Web Services Exchange option shall support Asynchronous Web Services requirements as defined in ITI TF-2x: V.5.

3.51.4.1.2.1 Query Definitions

This profile 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 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.

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

[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 $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)

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:

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

[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.

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.

The Document Registry actor 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 actor 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.

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"
```

IHE-WSP202) The targetNamespace of the WSDL shall be "urn:ihe:iti:xds-b:2007"

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:
2. namespace=" urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0", schemaLocation="query.xsd"
3. The /definitions/message/part/@element attribute of the Multi-Patient Stored Query Request message shall be defined as "query:AdhocQueryRequest"
4. The /definitions/message/part/@element attribute of the Multi-Patient Stored Query Response message shall be defined as "query:AdhocQueryResponse"
5. The /definitions/portType/operation/input/@wsaw:Action attribute for the Multi-Patient Stored Query Request message shall be defined as "urn:ihe:iti:2009:MultiPatientStoredQuery"
6. 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"
7. The /definitions/binding/operation/soap12:operation/@soapAction attribute should be defined as "urn:ihe:iti:2009:MultiPatientStoredQuery"

The following WSDL fragment shows an example of Multi-Patient Stored Query transaction definition:

```
<?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"/>
      ...
    </xsd:schema>
  </types>
  <message name="RegistryStoredQuery_Message">
    <documentation>Multi-Patient Stored Query</documentation>
    <part name="body" element="query:AdhocQueryRequest"/>
  </message>
  <message name="RegistryStoredQueryResponse_Message">
    <documentation>Multi-Patient Stored Query Response</documentation>
```



```
    <part name="body" element="query:AdhocQueryResponse"/>
  </message>
  ...
  <portType name="MPQRegistry_PortType">
    <operation name="MultiPatientStoredQuery">
      <input message="ihe:RegistryStoredQuery_Message"
          wsaw:Action="urn:ihe:iti:2009:MultiPatientStoredQuery"/>
      <output message="ihe:RegistryStoredQueryResponse_Message"
          wsaw:Action="urn:ihe:iti:2009:MultiPatientStoredQueryResponse"/>
    </operation>
    ...
  </portType>
  ...
</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

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.

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">
    <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>
        </a:ReplyTo>
        <a:To>http://localhost/service/IHEMPQRegistry.svc</a:To>
    </s:Header>
    <s:Body>
        <query:AdhocQueryRequest
            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"/>

            <!-- FindDocumentsForMultiplePatients -->
            <rim:AdhocQuery id="urn:uuid:3d1bdb10-39a2-11de-89c2-2f44d94eaa9f">
                <rim:Slot name="$XDSDocumentEntryStatus">
                    <rim:ValueList>
                        <rim:Value>('urn:oasis:names:tc:ebxml-
regrep:ResponseStatusType:Approved')</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Slot name="$XDSDocumentEntryClassCode">
                    <rim:ValueList>
                        <rim:Value>'26436-6'</rim:Value>
                    </rim:ValueList>
                </rim:Slot>
                <rim:Slot name="$XDSDocumentEntryClassCodeScheme">
```



```
                    <rim:ValueList>
                        <rim:Value>'LOINC'</rim:Value>
                    </rim:ValueList>
                </rim:Slot>

                <!-- Note the lack of a specification of the $XDSDocumentEntryPatientId parameter
-->


            </rim:AdhocQuery>
        </query:AdhocQueryRequest>
    </s:Body>
</s:Envelope>
```

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>
        <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>
        <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">

                <!-- Internal details of ExtrinsicObjects are not shown -->

                <rim:ExtrinsicObject/>
                <rim:ExtrinsicObject/>
                <rim:ExtrinsicObject/>
                <rim:ExtrinsicObject/>
                <rim:ExtrinsicObject/>
            </rim:RegistryObjectList>
        </query:AdhocQueryResponse>
    </s:Body>
</s:Envelope>
```

3.51.4.1.3 Expected Actions

See Registry Stored Query [ITI-18] for Expected Actions.

3.51.5 Security Considerations

All of the Security Considerations found in ITI-18 apply with the following further profiling.

It is expected that the ATNA Secure Node authentication would be used to restrict access to the MPQ transaction. It is expected that few systems would be allowed to request the LeafClass return result.

3.51.5.1 Security Audit Considerations

The Actors involved shall record audit events for each patient identity that has been included in the result according to the following. It is important for security auditing that the audit message contain one patient identity to better handle these messages in the Audit Record Repository:

3.51.5.1.1 Document 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-51","IHE Transactions","Multi-Patient Query"0*
Source (Document Consumer) (1)			
Human Requestor (0..n)			
Destination (Document Registry) (1)			
Audit Source (Document Consumer) (1)			
Patient (1)			
Query Parameters(1)			

Source **AuditMessage/ ActiveParticipant**	UserID	C	When WS-Addressing is used: <ReplyTo/>
	AlternativeUserID	M	the process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.
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	*NA*	
	NetworkAccessPointID	*NA*	

6010 Where:

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, as specified in RFC 3881.

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	EV(2, RFC-3881, "Patient Number")
	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/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-51", "IHE Transactions", "Multi-Patient Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	Stored Query ID (UUID)
	ParticipantObjectName	C	If known the value of <ihe:HomeCommunityId/>
	ParticipantObjectQuery	M	the AdhocQueryRequest, base64 encoded.
	ParticipantObjectDetail	*U*	*not specialized*

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	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("ITI-51", "IHE Transactions", "Multi-Patient Query")
Source (Document Consumer) (1)			
Destination (Document Registry) (1)			
Audit Source (Document Registry) (1)			
Patient (0..1)			
Query Parameters(1)			

6015 Where:

Source **AuditMessage/ ActiveParticipant**	UserID	C	When WS-Addressing is used: <ReplyTo/>
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	M	"true"
	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, as specified in RFC 3881.

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, as specified in RFC 3881.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*Not specialized.*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (Person)
	ParticipantObjectTypeCodeRole	M	"1" (Patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	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 **(AudittMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"2" (system object)
	ParticipantObjectTypeCodeRole	M	"24" (query)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV("ITI-51", "IHE Transactions", "Multi-Patient Query")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	Stored Query ID (UUID)
	ParticipantObjectName	C	If known the value of <ihe:HomeCommunityId/>
	ParticipantObjectQuery	M	the AdhocQueryRequest, base64 encoded.
	ParticipantObjectDetail	*U*	*not specialized*

