



Nationwide Health Information Network (NHIN)  
Trial Implementations  
Service Interface Specifications  
**Subject Discovery**

V 1.9.4

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## 1 Preface

### 1.1 Introduction

The NHIN Trial Implementations Service Interface Specifications constitute the core services of an operational Nationwide Health Information Network. They are intended to provide a standard set of service interfaces that enable Nationwide Health Information Exchange (NHIE) to NHIE exchange of interoperable health information. These services provide such functional capabilities as patient look-up, document query and retrieve, notification of consumer preferences, and access to logs for determining who has accessed what records and for what purpose for use. These functional services rest on a foundational set of messaging and security services. The current set of defined core services includes the following:

1. NHIN Trial Implementations Message Platform Service Interface Specification,
2. NHIN Trial Implementations Authorization Framework Service Interface Specification,
3. NHIN Trial Implementations Subject Discovery Service Interface Specification,
4. NHIN Trial Implementations Query for Documents Service Interface Specification,
5. NHIN Trial Implementations Document Retrieve Service Interface Specification,
6. NHIN Trial Implementations Audit Log Query Service Interface Specification,
7. NHIN Trial Implementations Consumer Preferences Service Interface Specification
8. NHIN Trial Implementations Health Information Event Messaging Service Interface Specification
9. NHIN Trial Implementations NHIE Service Registry Interface Specification
10. NHIN Trial Implementations Authorized Case Follow-Up Service Interface Specification

It is expected that these core services will be implemented together as a suite since the functional level services are dependent on the foundational services. Specifications #1 through #7 were the focus of the August 2008 testing event and September AHIC demonstrations. Specifications #1 through #9 were included in the November testing and demonstrations during the December 2008 NHIN Trial Implementations Forum.

### 1.2 Intended Audience

The primary audience for the NHIN Trial Implementations Service Interface Specifications is the individuals responsible for implementing software solutions that realize these interfaces for a NHIE. After reading this specification, one should have an understanding of the context in which the service interface is meant to be used, the behavior of the interface, the Web Services Description Language (WSDLs) used to define the service, any Extensible Markup Language (XML) schemas used to define the content and what “compliance” means from an implementation testing perspective.

### 1.3 Focus of this Specification

This document presents the NHIN Trial Implementations Subject Discovery Service Interface Specification. The purpose of this service is to provide patient arbitration capabilities between NHIEs in support of document query service which is described in a separate specification.

The term “subject discovery” is used in this specification to refer to the broader case of matching persons, whether they are patients, consumers or others whose data are being exchanged

#### 1.3.1 Business Needs Supported by this Specification

- During the course of patient care, a clinician will, at times, make a request for available clinical information, which may include information not available within their clinical system. The NHIE receiving that request, may be able to fulfill the request directly, or may also request available information from other NHIEs in order to fulfill the request. This capability may also support delivery of other types of patient-specific information between NHIEs.



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- For the inter-NHIE portion of the scenario, both the requesting and responding NHIEs need to confirm that they are both referring to the same person or subject. In this specification, the process may be described as “patient matching” or “identity arbitration” depending upon the specific scenario being discussed, as described in section 3.4 of this specification.
- This specification focuses specifically on the inter-NHIE exchange of information necessary for the requesting NHIE to provide attributes of the target person, for the responding NHIE to determine whether the target person is known, and to return the information necessary for the initiating NHIE to determine whether there is a match.

### 1.3.2 Key Attributes of the Specification

- The specification supports subject discovery/patient arbitration between NHIEs, i.e., it is an inter-NHIE or gateway-to-gateway specification.
- The specification is focused on transactional or ad-hoc patient matching and identity reconciliation as needed to support real-time query activities between NHIEs.
  - It is envisioned that any number of “trigger events” within the clinician workflow process could initiate a patient arbitration request and receive back an unambiguous patient identity to be used by that workflow to subsequently request clinical documents relating to that patient. The unambiguous patient identity is in the form of a persistent unique identifier used by the responding NHIE to refer to the patient and remains persistent until revoked.
  - The requesting NHIE provides patient-specific demographic data for use by the responding NHIE to evaluate whether the patient is known to the responding NHIE. Typically, an NHIE deploys a patient identity correlation service to calculate the likelihood of a patient’s demographics matching the demographics supplied by another NHIE. This specification describes specific scenarios for handling a positive match, an ambiguous match, and the need to retract/revoke an identity match previously confirmed.
  - If the responding NHIE makes the correlation, it provides it’s demographics of the patient back to the initiating NHIE who can either trust the decision of the responding NHIE or make a similar correlation process using its own algorithm.
  - The specification allows NHIEs to make identity correlations based on their own algorithm and not that of another NHIE.
- The service is agnostic about the details of how patient identity is managed within a given NHIE. As such it can accommodate various architectural approaches including “centralized” master patient index as well as distributed, virtual or federated strategies.

### 1.3.3 Scenarios for Use

The following usage scenarios are supported by the specification

Case 1- Subject Query: No Match



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- Case 2- Subject Query: Unambiguous Match
- Case 3- Subject Query Return: Unambiguous Match Returned to Requesting NHIE
- Case 4- Subject Query: Multiple Ambiguous Matches
- Case 5- Subject Query Return: Multiple Ambiguous Matches Returned to Requesting NHIE
- Case 6- Subject Revocation: Revoke Subject from NHIE 1 to NHIE 2
- Case 7- Subject Announce: Change of Demographics
- Case 8- Subject Announce: Subject Merge
- Case 9- Subject Announce: Subject Unmerge

### 1.3.4 Assumptions

This specification assumes that the participating NHIE implements the messaging platform and authorization framework service interface specifications. Further, it assumes that the NHIE has implemented a Master Patient Index functionality with the ability to correlate identities based on a trait set and that if there is a match a unique identifier will be returned to the service interface to be used by the querying NHIE to request records.

## 2 Introduction

### 2.1 Purpose

This specification defines the Subject Discovery service interface. It is used between NHIEs for the purpose of querying for a subject, and upon a positive match returns a unique identifier that may be used to query for records on that subject. The subject referred to in this specification is a healthcare consumer, patient or may be a provider. Subject as used in this specification does not include system user.

### 2.2 Definitions

The use of the term "Patient" in this document is intended to mean the subject of an electronic health record and does not imply any legal constructs such as Patient-Provider legal relationship or other semantics.

### 2.3 Related Documents

The following documents and standards were referenced during the development of this specification:

#### 2.3.1 Relationship to the IHE PIX V3 Profile

This Subject Discovery Service Interface is based on the IHE IT Infrastructure Technical Framework – Patient Identifier Cross-Reference HL7 V3 (PIXV3) and Patient Demographic Query HL7 V3 (PDQV3) Supplement Draft for Trial Implementation 20 August 15, 2007. The IHE PIX V3 Profile restricts the data elements it uses to a strict subset of the Patient Revise (PRPA\_RM201302UV) RMIM by removing all optional attributes in the Patient and Person classes. The NHIN Subject discovery interface differs by extending the IHE PIC V3 Profile by removing this restriction so that the demographic person fields are available.

#### 2.3.2 Relationship to HITSP Constructs

HITSP/TP22 Patient ID Cross-Referencing Transaction Package Released for Implementation 20070511 V2.0 refers to Patient Identifier Cross-Reference (PIX) and Patient Demographic Query (PDQ) HL7 v3 Integration Profiles Publication Date: November 6, 2006. In this version only HL7 v2 is required to be supported. It is optional to support HL7 v3 also. If HL7 v3 is supported, the vendor is required to support all of the HL7 v3 messages available corresponding to the PIX/PDQ Transactions. For the NHIN Trial Implementations the Core Service Technical and Security Work Group has determine it will use the IHE



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IT Infrastructure Technical Framework – Patient Identifier Cross-Reference HL7 V3 (PIXV3) and Patient Demographic Query HL7 V3 (PDQV3) Supplement Draft for Trial Implementation 20 August 15, 2007 as the basis of this version of Subject Discovery. It identifies the PIX V3 Update transaction as described earlier and contains one interaction: Patient Registry Record Revised (PRPA\_IN201302)

Please note: HITSP has not yet updated TP22 Patient ID Cross-Referencing Transaction Package to the IHE Standard. The Technical and Security Work Group is working in conjunction with HITSP on this and has requested this update to the HITSP TP22 Construct.

### 2.3.3 Relationship to other NHIN Cooperative Specifications

This specification utilizes the transmission and security standards identified in the NHIN Messaging Platform Interface Specification and NHIN Authorization Framework. Specifically, each transaction identified in this specification must contain assertions about the identity and role of the user or system initiating the request. The transactions described in this specification should include a purpose for use assertion indicating a “Healthcare Operations”.

### 2.3.4 Relationship to the Master Patient Index

This document does not describe the details of implementation of a Master Patient Index (MPI). Architectural decisions regarding the MPI such as whether it is centralized or decentralized are left up to the implementing NHIE. At a minimum, it is assumed that whatever the implementation the MPI can make a match based on a set of demographic data and return an identifier.

## 3 Interface Description

### 3.1 Definition

In order to share patient data within and among NHIEs, and at times between NHIEs and connected organizations, it is necessary to have mechanisms to match patient identities in the absence of a single national identifier. Even where a national identifier may exist, there is a need for identifying common patients, since existing systems may not have adapted to the identifiers, or these identifiers may not be fully synchronized.

The context for using this interface is described using IHE IT Infrastructure Technical Framework – Patient Identifier Cross-Reference HL7 V3 (PIXV3) and Patient Demographic Query HL7 V3 (PDQV3) Supplement Draft for Trial Implementation 20, August 15, 2007

The role of the initiating NHIE at the Cross Community Gateway is that of a Patient Identifier Cross-reference Manager. A Patient Identity Source **within** the NHIE announces patients with the patient identity feed to the Patient Identifier Cross-reference Manager.

The role of the responding NHIE at the Cross Community Gateway is that of a Patient Identifier Cross-reference Consumer.

*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 interested in receiving such notifications using the PIX Update Notification HL7 V3 transaction (see Section 3.46 for the details of that transaction).*

Therefore, this interface between NHIE and NHIE corresponds to Transaction PIXV3 Update Notification 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.

The PIX V3 Update Notification as published does not deal with the Cross Community lateral configuration of the NHIN and therefore these changes and extensions will probably be candidates for a





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Cross Community PIX Update Notification Profile (XPUNP) to be worked through the standards organizations.

Each NHIE will behave in roles as both a Patient Identifier Cross-reference Consumer and Patient Identifier Cross-reference Manager.

These actor names will be abbreviated in this specification to Cross-reference Manager and Cross-reference Consumer.

However since the Source (Cross-reference Manager) only emits the notifications and receives acknowledgements the whole focus on the role can be that of the **Cross-Reference Consumer which supports the Subject Discovery Interface**. Subject Discovery Interface will extend the IHE Profile to support:

- Patient Registry Record Added([PRPA\\_IN201301UVO2](#))
- Patient Registry Record Nullified([PRPA\\_IN201303UVO2](#))
- Patient Registry Duplicates Resolved([PRPA\\_IN201304UVO2](#))

Only Patient Registry Record Revised (PRPA\_IN201302) is included in the IHE PIX V3 profile so the other interactions are extension to the Profile.

### 3.2 Triggers

The Cross-reference Manager may send a person notification to a Subject Discovery Interface on the following events of the choosing of the design for the NHIE:

1. New subject announcement (Uses Patient Registry Record Added)
  - a. Patient registering in a community where the default setting allows disclosure over the NHIN
  - b. Patient authorizing disclosure over the NHIN
  - c. A community connecting to another community with existing patients with disclosure authorized.
  - d. A user directed arbitration for a patient directed at a specific community possibly at record query time.
2. A successful match by the Cross-Reference Consumer of a patient from its receipt of a person notification. (Returns Patient Registry Record Revised) This is where the roles of the initiating and responding NHIE are reversed in that the Cross-Reference Consumer becomes a Source and acts as a Cross-Reference Manager.
3. An ambiguous match of a patient where there are multiple possible candidates. (Uses Patient Registry Record Added). Again, the roles of the initiating and responding NHIE are reversed in that the Cross-Reference Consumer becomes a Source. (Returns Patient Registry Record Added as if it were a new discovery)

Other conditions for sending a Patient notification are identified later.

A Cross-Reference Consumer role will receive notifications from other Cross-Reference Managers and must process them as new notifications or as responses to their previous notifications. The notifications may be made in a broadcast mode to multiple NHIEs in 1.a/b/c or in a directed mode in 1.d, 2 and 3 above. The dispersal of the broadcast may be of the NHIEs choosing and may depend on the circumstances. Further guidance is needed on these strategies. The most likely broadcast is to those NHIEs where shared subjects are expected such as in adjacent cross state boundary HIEs, snowbird migration, or overlapping service areas. The decision to go in directed or broadcast direction is likely to be influenced by the capability of the subject to indicate to the user where records are held and the cost of changing the health systems to support directed discovery.



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This specification allows NHIEs to adopt the direction strategy of their choice with the restriction that they must always respond in the Subject Discovery Interface. Identity matching may be performed by independent Deterministic or Probabilistic algorithms. The Subject Discovery Interface (as Consumer) accepts the PIXV3 Update Notification and attempts to update or correlate the person within the responding NHIE.

### 3.3 Transaction Standard

The context for use is described using IHE IT Infrastructure Technical Framework – Patient Identifier Cross-Reference HL7 V3 (PIXV3) and Patient Demographic Query HL7 V3 (PDQV3) Supplement Draft for Trial Implementation 20 August 15, 2007

Subject Discovery Interface will extend the IHE Profile to support:

Patient Registry Record Added ([PRPA\\_IN201301UV02](#))

Patient Registry Record Nullified ([PRPA\\_IN201303UV02](#))

Patient Registry Duplicates Resolved ([PRPA\\_IN201304UV02](#))

Only Patient Registry Record Revised (PRPA\_IN201302) is included in the IHE PIX V3 profile so the other interactions are extension to the Profile.

Therefore this interface between NHIE and NHIE corresponds to Transaction PIXV3 Update Notification 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.

### 3.4 Use Case/Event/Actions Supported:

#### 3.4.1 Identify Subject

Identify Subject – Search for candidate subject matches from an NHIE registry.	Out of scope because it is within the HIE but would be supported by the PIX if implemented
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#### 3.4.2 Arbitrate Identity

Identify Subject – Search for candidate subject matches within an NHIE registry.	Out of scope but would be supported by the PIX if implemented
Arbitrate Identity – Request, access, reconcile and link cross-registry candidate subject matches.	PIX Update feed as described in this interface

#### 3.4.3 Locate Records

Identify Subject – Search for candidate patient matches within an NHIE registry based on subject-identifying information provided by a user requesting the record location	This is supported indirectly by the return of unambiguous identities with their location
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#### 3.4.4 Maintain Consumer Data Sharing Permissions

Register and maintain the consumer's permissions for allowing providers to view and access their data	The interface enforces the permissions by matching the security assertions with the sharing permissions
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### 3.5 NHIE Core Services

#### 3.5.1 Data Services

Data Look up, retrieval and data location	Supports the XCA PIX which has locations of
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registries	subject
Subject-data matching capabilities	See Arbitrate Identity and Identity Subject
Summary patient record exchange	Indirect support of this through subject discovery location of subject

### 3.5.2 Consumer Services

Support of consumer information location requests and data routing to consumer-identified personal health records.	Subject identity management will support the location of subjects (patients) and their PHR custodians within an NHIE
Management of consumer choices not to participate in network services	The interface enforces the permissions by matching the security assertions with the sharing permissions

### 3.5.3 User and Subject Identity Management Services

Subject identity arbitration with like identities from other HIEs	This is a primary function of the Subject Discovery Interface
Management of user credentialing information.	When these credentials are medical, the interface will support the identification of providers and their location and thereby indirectly support the retrieval of credentials
Support of an HIE-level, non-redundant methodology for managed identities	Subject identifiers will be fully scoped as defined in the HL7 PID section.

### 3.6 Technical Pre-conditions/Technical Post-conditions

Nine Cases or scenarios are described involving different pre-conditions and their corresponding post-conditions. This allows behavior to be specified. In the cases, NHIE 1 is the initiating (Manager) NHIE and NHIE 2 is the responding (Consumer) NHIE except where the reverse notification occurs and NHIE 2 becomes the initiator. All pre and post conditions are in the context of the behavior of the responder which implements the Subject Discovery Interface.

### 3.7 Cases

1. Case 1 – Subject Query: No Match: NHIE 1 announces Subject to NHIE 2 Patient Registry Record Added([PRPA\\_IN201301UV02](#)) which cannot match
2. Case 2 – Subject Query: Unambiguous Match; NHIE 1 announces Subject to NHIE 2 Patient Registry Record Added ([PRPA\\_IN201301UV02](#)) which can match unambiguously.
3. Case 3- Subject Query Return: Unambiguous Match Returned to Requesting NHIE: NHIE 2 returns the unambiguous announcement to NHIE 1 Patient Registry Record Revised([PRPA\\_IN201302UV02](#))
4. Case 4- Subject Query: Multiple Ambiguous Matches: NHIE 1 announces Subject to NHIE 2 Patient Registry Record Added ([PRPA\\_IN201301UV02](#)) which finds multiple ambiguous matches.
5. Case 5- Subject Query Return: Multiple Ambiguous Matches Returned to Requesting NHIE: NHIE 2 returns the ambiguous announcement to NHIE 1 Patient Registry Record Added([PRPA\\_IN201301UV02](#))– TBD
6. Case 6- Subject Revocation: Revoke Subject from NHIE 1 to NHIE 2: NHIE 1 revokes the Subject to NHIE 2 Patient Registry Record Nullified([PRPA\\_IN201303UV02](#))
7. Case 7- Subject Announce: Change of Demographics: NHIE 1 announces change of demographics to NHIE 2 Patient Registry Record Revised([PRPA\\_IN201302UV02](#))



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8. Case 8- Subject Announce: Subject Merge NHIE 1 announces merge of subjects to NHIE 2 Patient Registry Duplicates Resolved([PRPA\\_IN201304UV02](#))
9. Case 9- Subject Announce: Subject Unmerge: NHIE 1 announces unmerge of subjects to NHIE 2 Patient Registry Record Nullified ([PRPA\\_IN201303UV02](#)) and then Patient Registry Record Added ([PRPA\\_IN201301UV02](#))

### **3.7.1 Case 1- Subject Query: No Match - NHIE 1 announces Subject to NHIE 2 which cannot match**

This case is where NHIE 2 does not know or recognize the subject described by the demographics from NHIE 1. Between large NHIE without directed arbitration, this is likely to be the most frequent result of a Subject Discovery request.

#### **3.7.1.1 Technical Pre-conditions:**

All the following pre-conditions must be true:

- The two NHIes have previously established a secure connection between them.
- The subject is known by NHIE 1 and the combination of security assertions and sharing permissions allows identity disclosure.
- The NHIE 1 subject unique identifier is included in the traits.
- Patient Registry Record Added ([PRPA\\_IN201301UV02](#)) is sent from NHIE 1 to NHIE 2.
- In NHIE 2, no candidate is above the lower threshold Subject (i.e. is not known) where the combination of security assertions and sharing authorization allow the disclosure of the subject.
- The NHIE 2 subject unique identifier is not included in the traits. (if it is then it will become Case 7)

#### **3.7.1.2 Technical Post-conditions:**

In this case, no return notification will be made.  
The accept acknowledgement is returned to NHIE 1.

### **3.7.2 Case 2- Subject Query: Unambiguous Match - NHIE 1 announces Subject to NHIE 2 which can match unambiguously.**

This case is where the subject is unambiguously matched in NHIE 2. In this circumstance, a reverse notification is returned to NHIE 1 as defined in Case 3.

#### **3.7.2.1 Technical Pre-conditions:**

All the following pre-conditions must be true:

- The two NHIes have previously established a secure connection between them.
- The subject is known by NHIE 1 and the combination of security assertions and sharing permissions allow identity disclosure.
- The NHIE 1 unique identifier is included in the traits.
- The NHIE 2 unique identifier is not included in the traits. (If it is then it is considered a demographic update Case 7).
- Patient Registry Record Added ([PRPA\\_IN201301UV02](#)) is sent from NHIE 1 to NHIE 2.
- The matching algorithm in NHIE 2 makes an unambiguous match to only one candidate.



- The combination of security assertions and sharing permissions in NHIE 2 allow identity disclosure.

### 3.7.2.2 Technical Post-conditions:

- NHIE 2 must initiate Case 3 back to the NHIE 1.
- NHIE 1 waits for an accept acknowledgement from NHIE 2 if the application workflow requires it.
- NHIE 2 may store the correlation between its subject unique identifier and that sent by NHIE 1 along with the demographics from NHIE 1. This option is for NHIEs which are maintaining a PIX in the Cross Community Gateway as specified in XCA.

### 3.7.3 Case 3- Subject Query Return: Unambiguous Match Returned to Requesting NHIE - NHIE 2 returns the unambiguous announcement to NHIE 1

This case is where a match return is sent back to the initiating NHIE (1). This is arguably part of Case 2 but is separated because it is a different interaction triggered by Case 2 and the responder is now NHIE 1.

#### 3.7.3.1 Technical Pre-conditions:

All the following pre-conditions must be true:

- The two NHIEs have previously established a secure connection between them.
- Is the result of the occurrence of Case 2
- Both NHIE 1 and NHIE 2 unique identifiers are included in the traits.
- Patient Registry Record Revised([PRPA\\_IN201302UV02](#)) is sent from NHIE 2 to NHIE 1
- NHIE 1 should validate the match with its own algorithm.

#### 3.7.3.2 Technical Post-conditions:

- NHIE 2 waits for NHIE 1 to send an accept acknowledgement (In-band is required for responses).
- NHIE 2 then sends an accept acknowledgement to NHIE 1 on the case 2 notification.
- An option is for NHIE 1 to use the unique subject identifier from NHIE 2 for an immediate query to NHIE 2 for information on that subject.
- NHIE 1 may store the correlation between its unique subject identifier and that sent by NHIE 2 along with the demographics from NHIE 2. This option is for NHIEs which are maintaining a PIX in the Cross Community Gateway as specified in XCA.

### 3.7.4 Case 4- Subject Query: Multiple Ambiguous Matches - NHIE 1 announces Subject to NHIE 2 which finds multiple ambiguous matches.

This case is still under review but a proposal is included here for consideration.

#### 3.7.4.1 Technical Pre-conditions:

All the following pre-conditions must be true:

- The two NHIEs have previously established a secure connection between them.
- The subject is known by NHIE 1 and the combination of security assertions and sharing permissions allow identity disclosure.
- The NHIE 1 unique identifier is included in the traits.
- The NHIE 2 unique identifier is not included in the traits. (If it is then it is considered a demographic update Case 7).



- Patient Registry Record Added ([PRPA\\_IN201301UV02](#)) is sent from NHIE 1 to NHIE 2.
- The matching algorithm in NHIE 2 finds multiple ambiguous candidates.

### 3.7.4.2 Technical Post-conditions:

- For each ambiguous match, if the combination of security assertions and sharing permissions in NHIE 2 allow identity disclosure then initiate Case 5 for the candidate and let NHIE 1 respond.
- NHIE 2 sends an Accept Acknowledgement after the Case 5 announcements have been accepted.
- Detect a recursive behavior where both NHIEs are ambiguous on a candidate,

### 3.7.5 Case 5- Subject Query Return: Multiple Ambiguous Matches Returned to Requesting NHIE - NHIE 2 returns the ambiguous announcement to NHIE 1 which matches.

#### 3.7.5.1 Technical Pre-conditions:

All the following pre-conditions must be true:

- Is the result of the occurrence of Case 4
- The two NHIEs will have established a secure connection between them.
- Only NHIE 2 unique identifiers are included in the traits.
- The subject unique identifier from NHIE 2 is not already known by NHIE 1. (If it is then it is considered a demographic update Case 7).
- Patient Registry Record Added ([PRPA\\_IN201301UV02](#)) is sent from NHIE 2 to NHIE 1.
- The matching algorithm in NHIE 1 makes an unambiguous match of the candidate.

#### 3.7.5.2 Technical Post-conditions:

- NHIE 1 accepts the candidate.
- NHIE 1 completes Case 3 back to NHIE 2
- NHIE 1 sends an Accept Acknowledgement to NHIE 2
- An option is for NHIE 1 to use the accepted subject unique identifier from NHIE 2 for an immediate query to NHIE 2 for information on that subject.
- NHIE 1 may store the correlation between its subject unique identifier and that the accepted subject from NHIE 2 along with the demographics from NHIE 2. This option is for NHIEs which are maintaining a PIX in the Cross Community Gateway as specified in XCA.

### 3.7.6 Case 6- Subject Revocation: Revoke Subject from NHIE 1 to NHIE 2- NHIE 1 revokes the Subject to NHIE 2

The revision should be sent to all NHIEs which know the person. If the initiator's unique identifier is missing this indicates that it has been deleted and constitutes a revocation of the Subject Identity. This case would be initiated by a subject revoking the authorization to disclose at the initiating NHIE.

#### 3.7.6.1 Technical Pre-conditions:

All the following pre-conditions must be true:

- The two NHIEs have previously established a secure connection between them.
- The subject is known by NHIE 1 and security assertions allow identity revocation.



- NHIE 1 unique identifier is **not** included in the traits.
- NHIE 2 unique identifier is included in the traits.
- The unique identifier from NHIE 1 is already known by NHIE 2.
- NHIE 1 sends Patient Registry Record Nullified([PRPA\\_IN201303UV02](#))
- The combination of security assertions and sharing permissions in NHIE 2 allow identity revocation.

### 3.7.6.2 Technical Post-conditions:

- NHIE 2 sends Accept Acknowledgement to NHIE 1
- The NHIE 1 corresponding identifier, if persisted, will be removed from NHIE 2.

### 3.7.7 Case 7- Subject Announce: Change of Demographics - NHIE 1 announces change of demographics to NHIE 2

The revision could be sent to all NHIEs that know the Patient. However, since other NHIEs might now know the Patient, it should be sent to the distribution used for new patients added.

A change of demographics is indicated by the initiating NHIE sending a Patient Registry Record Revised with the responding NHIE's subject identity defined.

### 3.7.7.1 Technical Pre-conditions:

The revision should be sent to all NHIEs that are sent new Patient notification.

All the following pre-conditions must be true:

- The two NHIEs have previously established a secure connection between them.
- The subject is known by NHIE 1 and the combination of security assertions and sharing permissions allow identity disclosure.
- NHIE 1 and NHIE 2 unique identifiers are included in the traits.
- The subject unique identifier from NHIE 1 is already known by NHIE 2. (If it is not then it is considered a notification Case 1, 2 or 4).
- Patient Registry Record Revised([PRPA\\_IN201302UV02](#)) is sent from NHIE 1 to NHIE 2
- The combination of security assertions and sharing permissions in NHIE 2 allow identity disclosure.

### 3.7.7.2 Technical Post-conditions:

- NHIE 2 sends the Accept Acknowledgement to NHIE 1
- NHIE 2 may store the correlation between its subject unique identifier and that sent by NHIE 1 along with the multiple demographics from NHIE 1 which is linked to the same subject identity. This option is for NHIEs which are maintaining a PIX in the Cross Community Gateway as specified in XCA.

### 3.7.8 Case 8- Subject Announce: Subject Merge - NHIE 1 announces merge of subjects to NHIE 2

This case is where an initiating NHIE announces that two subjects are considered to be a single successor.



### **3.7.8.1 Technical Pre-conditions:**

All the following pre-conditions must be true:

- The two NHIEs have previously established a secure connection between them.
- Both subjects are known by NHIE 1 and the combination of security assertions and sharing permissions allow identity disclosure.
- NHIE 1 and NHIE 2 unique identifiers are included in the traits for the two subjects.
- The successor unique identifier from NHIE 1 is already known by NHIE 2.
- NHIE 1 sends Patient Registry Duplicates Resolved([PRPA\\_IN201304UV02](#))
- The combination of security assertions and sharing permissions in NHIE 2 allow identity disclosure for the successor.

### **3.7.8.2 Technical Post-conditions:**

- NHIE 2 sends the Accept Acknowledgement to NHIE 1
- NHIE 2 may store the correlation between its subject identifier and that sent by NHIE 1 along with the multiple demographics from NHIE 1 which is linked to the same subject identity. This option is for NHIEs which are maintaining a PIX in the Cross Community Gateway as specified in XCA.
- If the identifiers are persisted, the predecessor's demographics are linked to the successor's identifier.

### **3.7.9 Case 9- Subject Announce: Subject Unmerge - NHIE 1 announces unmerge of subjects to NHIE 2 (SDI)**

This is the reversal of the merge in Case 8.

The case involves a revocation and announcement of the two patients.

### **3.7.9.1 Technical Pre-conditions:**

See the revocation Case 6 and announcement Case 2

### **3.7.9.2 Technical Post-conditions:**

None





### 3.8 Decision Table

Case	1 No match	2 Single match	3 Return single match	4 Ambiguous matches	5 Return ambiguous match	6 Revoke subject	7 Change of Demographics	8 Merge of subjects	9 Unmerge subjects
<b>Pre-condition</b>									
Previous Case			2		4				
Secure connection	Y	Y	Y	Y	Y	Y	Y	Y	
Assertions at Initiating NHIE allow disclosure	Y	Y	Y	Y	Y	Y	Y	Y	
Initiating NHIE subject id included	Y	Y	Y	Y	Y	N	Y	Y	
Responding NHIE subject id included	N	N	Y	N		Y	Y	Y	
Initiating NHIE subject id known at Resp NHIE				N	N		Y	Y	
Resp NHIE disclosable candidates above lower threshold	N			Y					
Resp NHIE - single disclosable candidate above upper threshold		Y	Y	N	Y				
Assertions at Responding NHIE allow disclosure	Y	Y	Y	Y	Y	Y	Y	Y	
<b>Post-condition</b>									
Case		3		5?					
Resp NHIE may store correlation		Y	Y	N	Y				
Resp NHIE may use response for query			Y		Y				
Resp NHIE may remove the initiator's subject identifier						Y			
Resp NHIE may link demographic sets							Y		
Resp NHIE may link identifiers								Y	

## 4 Interface Definition

In this section the interface is defined by delineating the following layers:

- Possible message syntaxes (XML structure, etc. - if applicable)
- Possible call syntax (web services parameters, etc. - if applicable):
- Content semantics (terminologies and terminology value sets):
- Content metadata semantics (those not included in A, B and C above):
- Security layer:
- Transport protocol

### 4.1 Possible message syntax (XML structure, etc. - if applicable)



#### 4.1.1 Listing of base standard(s) (e.g., HITSP TP#, Named standards)

HITSP/TP22 Patient ID Cross-Referencing Transaction Package Released for Implementation 20070511 V2.0 refers to Patient Identifier Cross-Reference (PIX) and Patient Demographic Query (PDQ) HL7 v3 Integration Profiles Publication Date: November 6, 2006. In this version only HL7 v2 is required to be supported. It is optional to support HL7 v3 also. If HL7 v3 is supported, the vendor is required to support all of the HL7 v3 messages available corresponding to the PIX/PDQ Transactions. For the NHIN Trial Implementations the Core Service Technical and Security Work Group has determine it will use the IHE IT Infrastructure Technical Framework – Patient Identifier Cross-Reference HL7 V3 (PIXV3) and Patient Demographic Query HL7 V3 (PDQV3) Supplement Draft for Trial Implementation 20 August 15, 2007 as the basis of this version of Subject Discovery. It identifies the PIX V3 Update transaction as described earlier and contains one interaction: Patient Registry Record Revised (PRPA\_IN201302)

#### 4.1.2 Implementation Level Constraints & Extensions

##### 4.1.2.1 Constraints to base standard

The Patient Registry Record Revised (PRPA\_IN201302) is removed

##### 4.1.2.2 Extensions to the base standard

###### 4.1.2.2.1 Add the following messages:

- Patient Registry Record Added([PRPA\\_IN201301UV02](#))
- Patient Registry Record Nullified([PRPA\\_IN201303UV02](#))
- Patient Registry Duplicates Resolved([PRPA\\_IN201304UV02](#))

###### 4.1.2.2.2 Symmetrical notification

Extend the behavior of the Cross-reference consumer to be also a Cross-reference manager and respond with the notification as described in the cases.

#### 4.2 Possible call syntax (web services parameters, etc. - if applicable):

This is a notification protocol without a call syntax. However for clarity the following table shows the Cases and their appropriate ADT message types.

Case	Message
1 No match	Patient Registry Record Added( <a href="#">PRPA_IN201301UV02</a> )
2 Single match	Patient Registry Record Added( <a href="#">PRPA_IN201301UV02</a> )
3 Return single match	Patient Registry Record Revised( <a href="#">PRPA_IN201302UV02</a> )
4 Ambiguous matches	Patient Registry Record Added( <a href="#">PRPA_IN201301UV02</a> )
5 Return ambiguous match	Patient Registry Record Added( <a href="#">PRPA_IN201301UV02</a> )
6 Revoke subject	Patient Registry Record Nullified( <a href="#">PRPA_IN201303UV02</a> )
7 Change of Demographics	Patient Registry Record Revised( <a href="#">PRPA_IN201302UV02</a> )
8 Merge of subjects	Patient Registry Duplicates Resolved( <a href="#">PRPA_IN201304UV02</a> )
9 Unmerge subjects	Patient Registry Record Nullified( <a href="#">PRPA_IN201303UV02</a> ) Patient Registry Record Added( <a href="#">PRPA_IN201301UV02</a> )

#### 4.3 Content semantics (terminologies and terminology value sets):

No extensions or restrictions

#### 4.4 Transport protocol:



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See Messaging Platform Interface Specification.

An example of WSDL with SOAP bindings is included:

```
<?xml version="1.0" encoding="UTF-8" ?>
- <definitions name="PIXConsumer" targetNamespace="urn:ihe:iti:pixv3:2007"
  xmlns:tns="urn:ihe:iti:pixv3:2007"
  xmlns:wsoap11="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns="http://schemas.xmlsoap.org/wsdl/"
  xmlns:wsaw="http://www.w3.org/2006/05/addressing/wsdl"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:hl7="urn:hl7-
    org:v3">
  <documentation>Example WSDL for PIX Consumer, receiving update
    notifications</documentation>
- <types>
- <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
  xmlns:hl7="urn:hl7-org:v3">
- <!--
  Include the message schema
  -->
  <xsd:include
    schemaLocation="../../../schema/HL7V3/multicacheschemas/PRPA_IN101301UV.xsd" />
  </xsd:schema>
- <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
  xmlns:hl7="urn:hl7-org:v3">
- <!--
  Include the message schema
  -->
  <xsd:include
    schemaLocation="../../../schema/HL7V3/multicacheschemas/PRPA_IN201302UV.xsd" />
  </xsd:schema>
- <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
  xmlns:hl7="urn:hl7-org:v3">
- <!--
  Include the message schema
  -->
  <xsd:include
    schemaLocation="../../../schema/HL7V3/multicacheschemas/PRPA_IN201303UV.xsd" />
  </xsd:schema>
- <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
  xmlns:hl7="urn:hl7-org:v3">
- <!--
  Include the message schema
  -->
  <xsd:include
    schemaLocation="../../../schema/HL7V3/multicacheschemas/PRPA_IN201304UV.xsd" />
  </xsd:schema>
- <xsd:schema elementFormDefault="qualified" targetNamespace="urn:hl7-org:v3"
  xmlns:hl7="urn:hl7-org:v3">
- <!--
  Include the message schema
  -->
  <xsd:include
    schemaLocation="../../../schema/HL7V3/multicacheschemas/MCCI_IN000002UV01.xsd" />
```



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---

```
</xsd:schema>
</types>
- <message name="PRPA_IN201301UV_Message">
  <part element="hl7:PRPA_IN201301UV" name="Body" />
</message>
- <message name="PRPA_IN201302UV_Message">
  <part element="hl7:PRPA_IN201302UV" name="Body" />
</message>
- <message name="PRPA_IN201303UV_Message">
  <part element="hl7:PRPA_IN201303UV" name="Body" />
</message>
- <message name="PRPA_IN201304UV_Message">
  <part element="hl7:PRPA_IN201304UV" name="Body" />
</message>
- <message name="MCCI_IN000002UV01_Message">
  <part element="hl7:MCCI_IN000002UV01" name="Body" />
</message>
- <portType name="PIXConsumer_PortType">
- <operation name="PIXConsumer_PRPA_IN201301UV">
  <input message="tns:PRPA_IN201301UV_Message" wsaw:Action="urn:hl7-
    org:v3:PRPA_IN201301UV" />
  <output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
    org:v3:MCCI_IN000002UV01" />
</operation>
- <operation name="PIXConsumer_PRPA_IN201302UV">
  <input message="tns:PRPA_IN201302UV_Message" wsaw:Action="urn:hl7-
    org:v3:PRPA_IN201302UV" />
  <output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
    org:v3:MCCI_IN000002UV01" />
</operation>
- <operation name="PIXConsumer_PRPA_IN201303UV">
  <input message="tns:PRPA_IN201303UV_Message" wsaw:Action="urn:hl7-
    org:v3:PRPA_IN201303UV" />
  <output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
    org:v3:MCCI_IN000002UV01" />
</operation>
- <operation name="PIXConsumer_PRPA_IN201304UV">
  <input message="tns:PRPA_IN201304UV_Message" wsaw:Action="urn:hl7-
    org:v3:PRPA_IN201304UV" />
  <output message="tns:MCCI_IN000002UV01_Message" wsaw:Action="urn:hl7-
    org:v3:MCCI_IN000002UV01" />
</operation>
</portType>
- <binding name="PIXConsumer_Binding_Soap11" type="tns:PIXConsumer_PortType">
  <wsoap11:binding style="document"
    transport="http://schemas.xmlsoap.org/soap/http" />
- <operation name="PIXConsumer_PRPA_IN201301UV">
  <wsoap11:operation soapAction="urn:hl7-org:v3:PRPA_IN201301UV" />
- <input>
  <wsoap11:body use="literal" />
</input>
- <output>
  <wsoap11:body use="literal" />
</output>
</operation>
```



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---

```
- <operation name="PIXConsumer_PRPA_IN201302UV">
- <soap11:operation soapAction="urn:h17-org:v3:PRPA_IN201302UV" />
- <input>
- <soap11:body use="literal" />
- </input>
- <output>
- <soap11:body use="literal" />
- </output>
- </operation>
- <operation name="PIXConsumer_PRPA_IN201303UV">
- <soap11:operation soapAction="urn:h17-org:v3:PRPA_IN201303UV" />
- <input>
- <soap11:body use="literal" />
- </input>
- <output>
- <soap11:body use="literal" />
- </output>
- </operation>
- <operation name="PIXConsumer_PRPA_IN201304UV">
- <soap11:operation soapAction="urn:h17-org:v3:PRPA_IN201304UV" />
- <input>
- <soap11:body use="literal" />
- </input>
- <output>
- <soap11:body use="literal" />
- </output>
- </operation>
- </binding>
- <service name="PIXConsumer_Service">
- <port binding="tns:PIXConsumer_Binding_Soap11" name="PIXConsumer_Port_Soap11">
- <soap11:address location="http://servicelocation/PIXConsumer_Soap11" />
- </port>
- </service>
- </definitions>
```



## 5 Error Handling

## 6 Auditing

An NHIE should create an “Export” audit event when sending a Notify message to another NHIE.

An NHIE should create an “Import” audit event when receiving a Notify message to another NHIE.

NHIEs are encouraged to create audit events when requesting, terminating, or accepting subscriptions.

## 7 Potential Future Considerations

The subject discovery service interface will be revisited after the December Forums to determine what modifications need to be made in response to the draft IHE Cross Community Patient Identification (XCPI) profile.

The T&S WG needs to address the need for provider, organization and device discovery on the NHIN. The question on the table is whether or not subject discovery can/should be generalized to become an entity discovery service interface.

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## **8 Appendix A – NHIN Schema to support Subject Discovery**

The current normative versions of the NHIN Schemas are posted on the HHS Portal under the Technical and Security tab in the Documents/Change Control/Approved/WSDLs and Schemas folder. It is at the following URL:

[https://portal.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_134075\\_208\\_359\\_138633\\_43/http%3B/collab.hhs.gov%3B11930/collab/do/document/overview?projID=22454](https://portal.hhs.gov/portal/server.pt/gateway/PTARGS_0_134075_208_359_138633_43/http%3B/collab.hhs.gov%3B11930/collab/do/document/overview?projID=22454)

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## 9 Appendix B – NHIN WSDLs: Subject Discovery

The current normative versions of the NHIN WSDLs are posted on the HHS Portal under the Technical and Security tab in the Documents/Change Control/Approved/WSDLs and Schemas folder. It is at the following URL:

[https://portal.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_134075\\_208\\_359\\_138633\\_43/http%3B/collab.hhs.gov%3B11930/collab/do/document/overview?projID=22454](https://portal.hhs.gov/portal/server.pt/gateway/PTARGS_0_134075_208_359_138633_43/http%3B/collab.hhs.gov%3B11930/collab/do/document/overview?projID=22454)

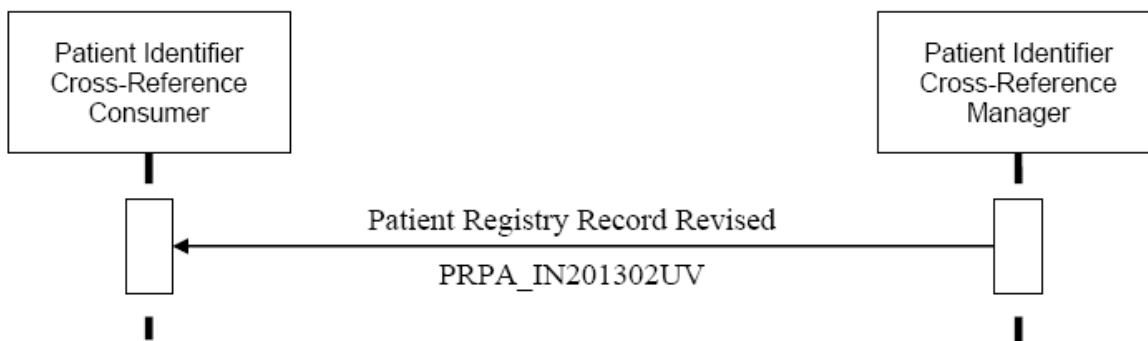
DRAFT



## 10 Appendix C – Scenarios – Interaction Diagrams

The following diagram is from section 3.46 PIXV3 Update Notification in the IHE IT Infrastructure Technical Framework Supplement 2007-2008 Patient Identifier Cross-Reference HL7 V3 (PIXV3) and Patient Demographic Query HL7V3 (PDQV3)

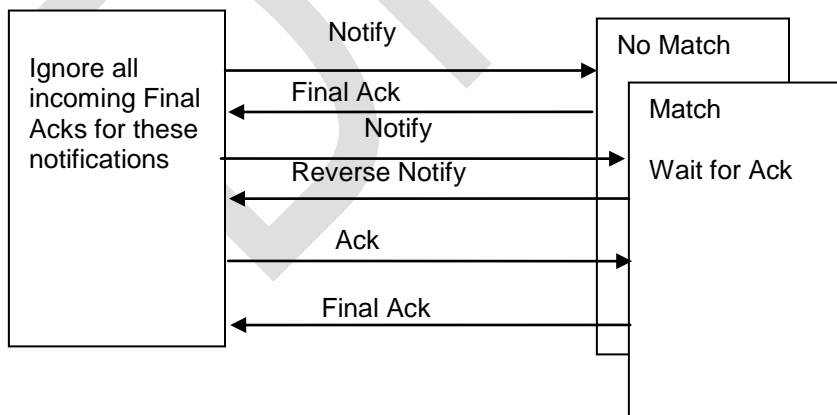
### 10.1 Diagram: Subject Discovery Update Announcement from Gateway



### 10.2 Subject Discovery Notification Interaction Diagrams

Note that the enclosing process in the responder must complete before the Ack is returned which causes all the other notifications as part of that process to complete. In-band response is required always. Two modes of operation of the interface will be supported but the behavior has changed significantly due to the change to HL7 V3 and they have converged to some small minor difference.

- A background asynchronous process which is started by some trigger event possibly the initial recognition of the subject or the onset of some activity indicated by an event such as an appointment. Completion of discovery is not signaled and steady state indicates that discovery has completed.

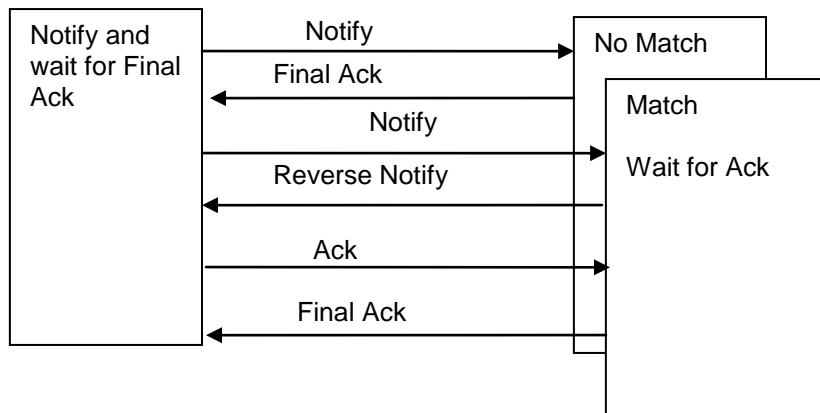


- A synchronous process where completion of the discovery must be waited for so that following actions such as query for documents can proceed.



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The type of behavior is not indicated in the notification. An asynchronous discovery never needs to wait for acknowledgement whereas a synchronous behavior always waits for acknowledgement, thus indicating when completion is made.



## 11 Appendix D Subject Discovery Implementation Rules and Conformance

### PRPA\_IN201301UV Message Semantics

The Subject Discovery Specification defines a notification interaction transaction using the the HL7 v3 Patient Added (PRPA\_IN201301UV) message. Constraint rules for message usage are defined in the subsequent sections.

The root element of the message SHALL be PRPA\_IN201301UV.

There SHALL be a a id element. The attribute root of id SHALL represent the unique id of the message.

The uniqueness of the id root (UUID, OID etc) is left to the implementor.

The element creationTime is the timestamp for the message creation and SHALL be present.

### Wrapper Constraints

The constraints to the Transmission wrapper are;

The value of attribute of extension for interactionId SHALL be set to PRPA\_IN201301UV.

The value of attribute code for processingModeCode SHALL be set to T .

The value of attribute code for acceptAckCode SHALL be set to AL .

There SHALL be only one receiver Device which SHALL be the responding HomeCommunityID.

There SHALL be only one sending Device which shall be the initiating HomeCommunityID

The constraints to the Control Act wrapper are:

The trigger event code in ControlActProcess.code SHALL be set to PRPA\_TE201301UV.

The RegistrationEvent.statusCode SHALL be set to "active" .

There SHALL be no InReplacementOf act relationship for these interactions.

### Major Components of the Patient Registry Record Added.

#### Patient Class

There SHALL be a patient element. The Patient class is the entry point to the HL7 R-MIMs for the Patient Registry Record Added.

There SHALL be a classCode attribute. The attribute classCode of patient defines a patient role. The classCode SHALL be "PAT".

There SHALL be an id element. The element id represent the identifiers designated by the patient identity source for the focal person.

There SHALL be an id attribute root. It SHALL be an ISO OID that represents the assigningAuthority.

There SHALL be an id attribute extension. This SHALL be an opaque string that represents the unique identifier of the patient Id.

The id attribute assigningAuthorityName is optional. This is a character string representing a human readable name for the assigning authority.

There SHALL be a statusCode element. The element statusCode specifies the state of the record in a patient registry. The attribute code of statusCode SHALL be "active".

#### Person Class

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.

There SHALL be a classCode attribute. The attribute classCode of person defines a person entity. The classCode SHALL be "PSN".

There SHALL be a determinantCode attribute. The attribute determinantCode indicates a specific person. The determinantCode SHALL be "INSTANCE".



## NHIN Trial Implementations Subject Discovery Service Interface Specification v 1.9.4

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There SHALL be a name element. The element name captures the name of a person. This specification will restrict the name representation to the use of child elements, given, family, suffix, prefix.

```
<name>  
  <given>Gallow</given>  
  <family>Younger</family>  
</name>
```

There SHALL be an administrativeGenderCode element. The element administrativeGenderCode . The code attribute for administrativeGenderCode SHALL be "M" (Male) or "F" (Female) or "UN" (Undifferentiated).

A persons address SHALL be represented if known.

A persons telecom SHALL be represented if known. The telecom number SHALL be represented in the value attribute.

A persons birthTime represents the date and time that a person was born. This element SHALL be present is known. The value for birthTime SHALL be represented as year/month/day (four-two-two digits).

The following demographic elements are optional:

deceasedInd, deceasedTime, multipleBirthInd, multipleBirthorderNumber, maritalStatusCode, religiousAffiliationCode, raceCode, EthicGroupCode, patientPerson.address.

### **Provider Organization Class**

The Patient class is scoped by the provider organization where the person is a patient. The HL7 definition of the CMET requires that the provider organization needs to be identified by an id attribute.

There SHALL be a providerOrganization element.

The root attribute of the id element SHALL be expressed as an ISO OID.

The providerOrganization extension SHALL not be present.

In this specification the requirement that at least one of address, telecommunications address, or contact person to be present is optional.

### **OtherIds Class**

The OtherIDs class is used to capture other identifiers associated with the person. 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 identifiers.

There SHALL be no Other Community Patient Ids in the message.

### **Optional Elements**

The class elements for languageCommunication, personalRelationship, citizen, and employee are optional.

### **Omitted Elements**

The following roles SHALL be omitted: asPatientOfOtherProvider, birthPlace, guarantor, guardian, contactParty, asMember, careGiver, asStudent

The following participations SHALL be omitted: subjectOf (administrativeObservation), coveredPartyOf (coverage)

---

### **MCCI\_IN000002UV01 – Accept Acknowledgement Message Semantics**



## NHIN Trial Implementations Subject Discovery Service Interface Specification v 1.9.4

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The Subject Discovery Specification defines the response to specific query interactions using the HL7 v3 Accept Acknowledgemnet (MCCI\_IN000002UV01) message. Constraint rules for message usage are defined in the subsequent sections.

The root element of the message SHALL be MCCI\_IN000002UV01.  
The element id represents the unique id of the message and SHALL be present.  
The element creationTime is the timestamp for the message creation and SHALL be present.  
There SHALL be interactionId. The interactionId SHALL be MCCI\_IN000002UV01.  
There SHALL be a processingCode. According to this specification the processingCode SHALL be set to "T" for Testing.  
There SHALL be a processingModeCode. According to this specification the processingModeCode SHALL be set to "T" for Current processing.  
The Message.acceptAckCode code attribute SHALL be fixed to NE.

### **Acknowledgement**

There SHALL be a class element acknowledgment.  
There SHALL be a typeCode element. The typeCode code SHALL be set to "CA" Accept Acknowledgement Commit Accept.  
There SHALL be a targetMessage element. The targetMessage id element SHALL be present. The id shall be the unique message Id of the message being acknowledged.

### **AcknowledgementDetail**

There is no informational detail in the Accept Acknowledgement

### **Omitted Attributes**

The following class attributes SHALL be omitted: Message.profileId , Message.attachmentText, Sender.telecom, Receiver.telecom , Device.desc, Device.existenceTime, Acknowledgement.messageWaitingNumber , Acknowledgement.messageWaitingPriorityCode

### **Omitted Elements**

The following elements SHALL be omitted:  
AttentionLine , RespondTo, LocatedEntity , scopedRole(Organization)

### **PRPA\_IN201302UV Message Semantics**

The Subject Discovery Specification defines a notification interaction transaction using the the HL7 v3 Patient Revised (PRPA\_IN201302UV) message. Constraint rules for message usage are defined in the subsequent sections.

The root element of the message SHALL be PRPA\_IN201302UV.  
There SHALL be a a id element. The attribute root of id SHALL represent the unique id of the message.  
The element creationTime is the timestamp for the message creation and SHALL be present.

### **Wrapper Constraints**

The constraints to the Transmission wrapper are:  
The value of attribute of extension for interactionId SHALL be set to PRPA\_IN201302UV.  
The value of attribute code for processingModeCode SHALL be set to T .  
The value of attribute code for acceptAckCode SHALL be set to AL .  
There SHALL be only one receiver Device which SHALL be the responding HomeCommunityID.  
There SHALL be only one sending Device which shall be the initiating HomeCommunityID

The constraints to the Control Act wrapper are:  
The trigger event code in ControlActProcess.code SHALL be set to PRPA\_TE201302UV.  
The RegistrationEvent.statusCode SHALL be set to "active" .  
There SHALL be no InReplacementOf act relationship for these interactions.

### **Major Components of the Patient Registry Record Revised**

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### **Patient Class**

There SHALL be a patient element. The Patient class is the entry point to the HL7 R-MIMs for the Patient Registry Record Revised.

There SHALL be a classCode attribute. The attribute classCode of patient defines a patient role. The classCode SHALL be "PAT".

There SHALL be a single id element. The element id represent the identifier designated by the HIE for the focal person.

There SHALL be an id attribute root. It SHALL be an ISO OID that represents the assigningAuthority. There SHALL be an id attribute extension. This SHALL be an opaque string that represents the unique identifier of the patient Id.

The id attribute assigningAuthorityName is optional. This is a character string representing a human readable name for the initiating assigning authority.

There SHALL be a statusCode element. The element statusCode specifies the state of the record in a patient registry. The attribute code of statusCode SHALL be "active".

### **Person Class**

The Person class contains the name of the patient for additional verification purposes.

There SHALL be a classCode attribute. The attribute classCode of person defines a person entity. The classCode SHALL be "PSN".

There SHALL be a determinatorCode. The attribute determinatorCode indicates a specific person. The determinatorCode SHALL be "INSTANCE".

These elements are the values as known by the initiating HIE and are not reflection of the previous message.

There SHALL be a name element. The element name captures the name of a person. This specification will restrict the name representation to the use of child elements, given, family, suffix, prefix.

```
<name>  
  <given>Gallow</given>  
  <family>Younger</family>  
</name>
```

There SHALL be an administrativeGenderCode element. The element administrativeGenderCode . The code attribute for administrativeGenderCode SHALL be "M" (Male) or "F" (Female) or "UN" (Undifferentiated).

A persons address SHALL be represented if known.

A persons telecom SHALL be represented if known. The telecom number SHALL be represented in the value attribute.

A persons birthTime represents the date and time that a person was born. This element SHALL be present is known. The value for birthTime SHALL be represented as year/month/day (four-two-two) digits.

The following demographic elements are optional:

deceasedInd, deceasedTime, multipleBirthInd, multipleBirthorderNumber, maritalStatusCode, religiousAffiliationCode, raceCode, EthicGroupCode patientPerson.address.

### **Provider Organization Class**

The Patient class is scoped by the provider organization where the person is a patient. The HL7 definition of the CMET requires that the provider organization needs to be identified by an id attribute.



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There SHALL be a providerOrganization element.

The root attribute of the id element SHALL be expressed as an ISO OID.

The providerOrganization extension SHALL not be present.

In this specification the requirement that at least one of address, telecommunications address, or contact person to be present is optional.

### **OtherIds Class**

The OtherIDs class is used to indicate an asserted matching identity in the responding HIE. Thus if the original notification is matched the returned notification contains the original ID in OtherIds. It is also used to capture other identifiers (such as SSN) associated with the person. In this transaction the IDs assigned by initiating HIE 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 of the responding HIE patient identifier SHALL be identical to the Patient Id root from the responding HIE in the PRPA\_IN201301UV Message.

OtherIDs.id.extension SHALL be identical to the patient identity in the responding HIE.

ScopingOrganization.id.extension SHALL NOT have any value identifiers.