Statewide PRL

Statewide MPI (sMPI) and PRL (sPRL)
Functional Specification

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Revision History

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1.0	04/10/2013	Joel Ryba	Original Draft
2.0	06/08/2013	Luke Doles	Update for NYeC implementation
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2.1.23	2/25/2015	Lin Wan	Updated section on DOB time component in XCPD query, and homeCommunityId prefix in XCA transactions.
2.1.24	5/15/2015	Lin Wan	Updated to add service timeout setting of 3 minutes.

Patient Record Lookup Leveraging Statewide Services

The state will provide the following key services to facilitate patient record lookup among qualified entities (QE) in the state.

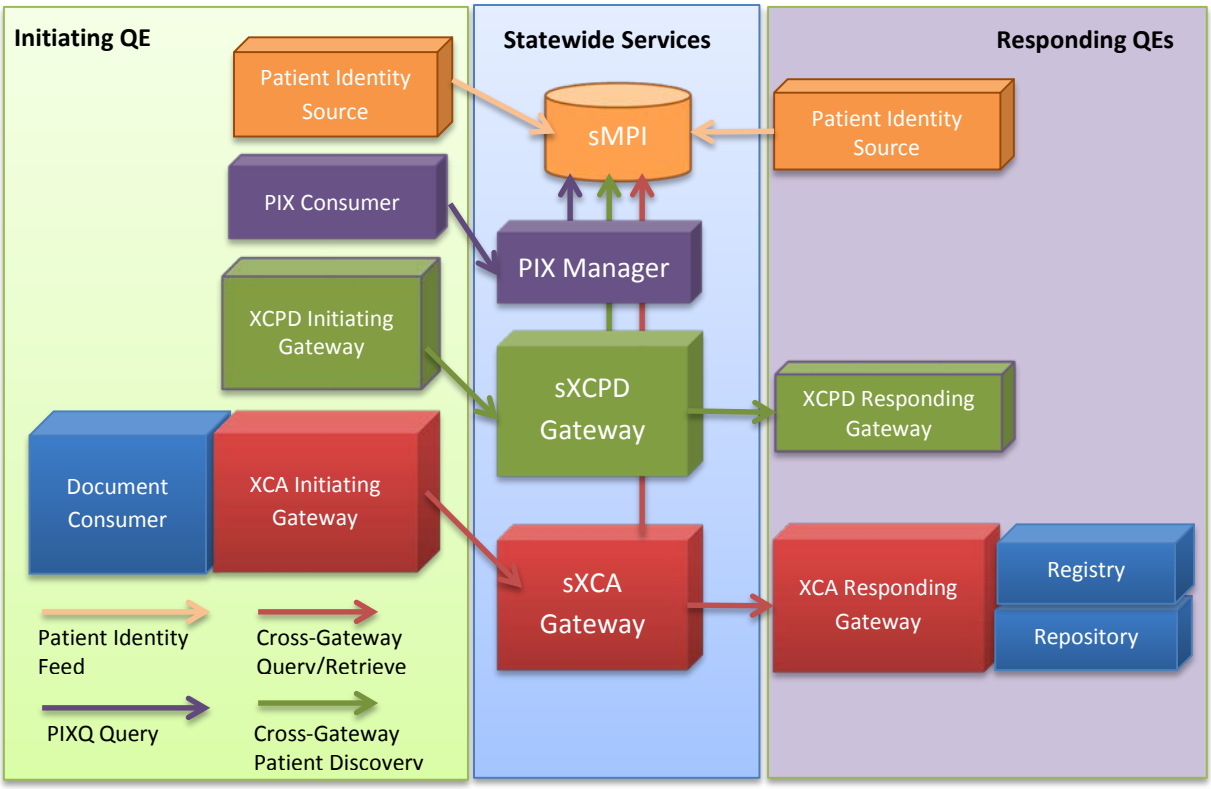
Statewide Master Patient Index (sMPI): By introducing a Statewide MPI (sMPI) capable of linking patient records across communities, each QE would have the capability to automatically discover and retrieve information about participating patients without a complex query process. The sMPI will provide PIXv3 Manager services and enable Statewide Cross-Community Patient Discovery (sXCPD) services. Each QE would simply need to provide their patient demographic set for all participating patients to the sMPI and then leverage any of the appropriate IHE profiles such as PIXv3, XCPD to discover patient identity throughout the state.

Statewide XCA Gateway (sXCA): instead of QEs querying each other directly, a Statewide Cross Community Document Access Gateway (sXCA) will act as the "hub" for cross-community document query and retrieve transactions. Individual QEs will not need to maintain configurations and connections to other QEs in the state. Querying the sXCA gateway leveraging IHE XCA profile will allow the QEs to lookup patient clinical record throughout the state.

Statewide XCPD Gateway (sXCPD): similar to the Statewide XCA service, the state can provide a Statewide Cross-Community Patient Discovery Gateway (sXCPD) that act as a "hub" for cross-community patient discovery transactions. QEs can discover patient in other communities throughout the state without having to maintain individual connections and configurations to each other.

The diagram below provides an overview of the key actors and transactions involved in Patient Record Lookup with statewide services. Subsequent sections in this document describe how these IHE profiles and their respective actors and transactions at a high level as to how they pertain to the use-cases for this statewide exchange.

Figure 1 System Overview



Statewide MPI (sMPI)

Use Cases

The main use case served by the sMPI is to establish a linked master patient record that cross-references patient identities from different communities, thus enabling document sharing in a variety of supported ways. Key use cases that will be supported include:

- Take patient identity feed from QEs and establish cross-reference of patient records from different QEs.
- Enable communities to discover patient identifiers in other communities either using local community patient ID or patient demographics.

Benefits

The sMPI service will help improve the accuracy, consistency and performance of patient record lookup as it performs the following:

- Establish patient identity cross referencing using consistent algorithms
- Speed up run time patient record look up performance as matching of identity is done ahead of time by the sMPI.

Applicable Profiles and Actors

The following table lists the applicable IHE transactions that are used to send data to the sMPI and to query the sMPI.

Profile	Implemented By	Actor	Transaction(s)
PIXv3	Statewide Services	Patient Identity Cross-Reference Manager	Patient Demographics Data Extract (non-IHE) PIXv3 Query PIXv3 Patient Identity Feed
PIXv3	QE	Patient Identity Source	Patient Demographics Data Extract (non-IHE) PIXv3 Patient Identity Feed
PIXv3	QE	Patient Identity Cross-reference Consumer	PIXv3 Query

In addition to the IHE profiles above, batch patient data load will be used for initial and incremental patient data load from QEs to the sMPI

The sections below describe the technical approaches for patient data load into the sMPI and for querying the sMPI.

Sending Data to the sMPI

QEs shall send demographics of their patient population to the sMPI to establish patient identity and cross-references with patient identity from other communities. The patient record from the QEs shall be the "best known" record at the QE level and carries the patient identifier at the QE level.

In most cases QEs will send data to the sMPI in the following 3 modes:

1. Initial bulk load of QE patients in batch format
2. Ongoing incremental update in batch format
3. Real-time patient update

Initial Patient Load - Patient Demographics Data Extract

The sMPI will support the following mechanism for the initial load of patient data from QEs:

1. **A bulk load from patient demographic files.** See Appendix A for more details on the file format and data elements requirements. The appendix will be expanded to become a **Patient Data Extract Guide** as more detailed specifications are developed.
2. **PIX V3 Add transactions:** the data elements that should be included in PIX V3 Add transactions are the same as the ones listed with priority R, 1 and 2 in the bulk load data set.

QEs can select which option to use as an implementation choice.

Ongoing Patient Updates – Incremental Patient Demographics Update

After the initial load of patient data, QEs not implementing real-time patient update shall send incremental changes of their patient population to the sMPI on a regular basis, covering add, update, and merges. Incremental changes can either be sent via real time patient update, described in the next section, or via regular batch messages to the sMPI using PIX v2 Patient Identity Feed messages (HL7 V2 ADT messages: A08,40) sent to the sMPI over sFTP. ADT messages for each patient should be packaged in 1 HL7 batch file. Incremental update frequency will start at a minimum of weekly and may be adjusted later during implementation.

Details of PIX v2 Patient Identity Feed can be found in IHE IT Infrastructure Technical Framework Volume 2a (ITI TF-2a) section 3.8. The HL7 version to use is HL7 2.3.1.

Add/Update: Adding new patient as well as update of patient demographics shall use A08 messages. The sMPI will automatically detect if a patient is new or existing and will add or update the patient accordingly. The table below lists how data elements defined in the sMPI load file format map to HL7 fields. See Appendix A for definition of Priority values listed in the table.

Field No.	Field	Priority	HL7 Field	Note
1.	**Source**	R	PID 3-3	Patient ID assigning authority
2.	**Source ID**	R	PID 3-1	
3.	Last Name	1	PID 5-1	

Field No.	Field	Priority	HL7 Field	Note
4.	First Name	1	PID 5-2	
5.	Middle Name	1	PID 5-3	
6.	Patient Address Line1	2	PID 11-1	
7.	Patient Address Line 2	2	PID 11-2	
8.	Patient City	2	PID 11-3	
9.	Patient State	2	PID 11-4	
10.	Patient Zip Code	2	PID 11-5	
11.	OTHER Patient Address Line1		PID 11-1	2nd occurrence
12.	OTHER Patient Address Line 2		PID 11-2	2nd occurrence
13.	OTHER Patient City		PID 11-3	2nd occurrence
14.	OTHER Patient State		PID 11-4	2nd occurrence
15.	OTHER Patient Zip Code		PID 11-5	2nd occurrence
16.	Phone Area – Home phone	2	PID 13-5	
17.	Phone number – Home phone	2	PID 13-6	
18.	Phone Area – Cell phone	2	PID 13-5	Use code CP for cell phone
19.	Phone number – Cell phone	2	PID 13-6	Use code CP for cell phone
20.	SSN	2	PID 19	
21.	Driver License Number		PID 20	
22.	Birth Date	1	PID 7	
23.	Gender	1	PID 8	
24.	Death Indicator		PID 30	
25.	Previous Name		PID 5	2nd occurrence
26.	Patients Maiden Name		PID 5	Name type M
27.	Patients Mother Maiden Name		PID 6	

Field No.	Field	Priority	HL7 Field	Note
28.	Last activity date	R		
29.	Next of Kin		NK1 2	
30.	Phone Area – Next of Kin Phone		NK1 5-5	
31.	Phone number – Next of Kin Phone		NK1 5-6	
32.	Next of Kin Relationship		NK1 3	
33.	Guarantor Last Name		GT1 3-1	
34.	Guarantor First Name		GT1 3-2	
35.	Phone Area Code – Guarantor Phone		GT1 6-5	
36.	Phone number – Guarantor Phone		GT1 6-6	
37.	Guarantor Relationship		GT1 11	
38.	Primary Physician		PD1 4	
39.	Registrar			Not relevant for current sMPI load.
40.	Phone Area Code – Work / Other Phone	2	PID 14-5	
41.	Phone number – Work / Other Phone	2	PID 14-6	
42.	Insurance – Name		IN1 16	
43.	BILLING Patient Address Line1			Not relevant for current sMP load.
44.	BILLING Patient Address Line 2			Same as above
45.	BILLING Patient City			Same as above
46.	BILLING Patient State			Same as above
47.	BILLING Patient Zip Code			Save as above
48.	Insurance – Relationship		IN1 17	

Field No.	Field	Priority	HL7 Field	Note
49.	Insurance - Plan ID		IN1 2	
50.	Insurance - Company ID		IN1 3	
51.	Insurance - Company Name		IN1 4	
52.	Insurance – Company Address		IN1 5	
53.	Insurance - Company Contact Person		IN1 6	
54.	Insurance - Company Phone Number		IN1 7	
55.	Group Number		IN1 8	
56.	Group Name		IN1 9	
57.	Insurance – Group Emp Name		IN1 11	
58.	Insurance - Plan Effective Date		IN1 12	
59.	Insurance - Plan Expiration Date		IN1 13	
60.	Insurance - Plan Type		IN1 15	
61.	Insurance - Policy Number		IN1 36	
62.	Insurance -Description			Not relevant for current sMPI load.
63.	Medical Record Number – Issuer			No relevant for current sMPI load. QEs will not send facility level MRN to sMPI.
64.	Medical Record Number – Number			QEs will not send facility level MRN to sMPI.

Merge: Merging patient shall use ADT A40 messages. The surviving patient information from the QE should be in carried in the PID segment, with patient ID from the QE in PID-3 and patient name in PID-5. The subsumed patient ID from the QE should be carried in the MRG segment in field MRG-1.

Real Time Patient Updates - IHE PIXv3 Patient Identity Feed

To support real-time patient updates to the sMPI the QE's system can use the IHE "Patient Identity Source" actor and send PIXv3 add/update/duplicates resolved messages to the PIX manager.

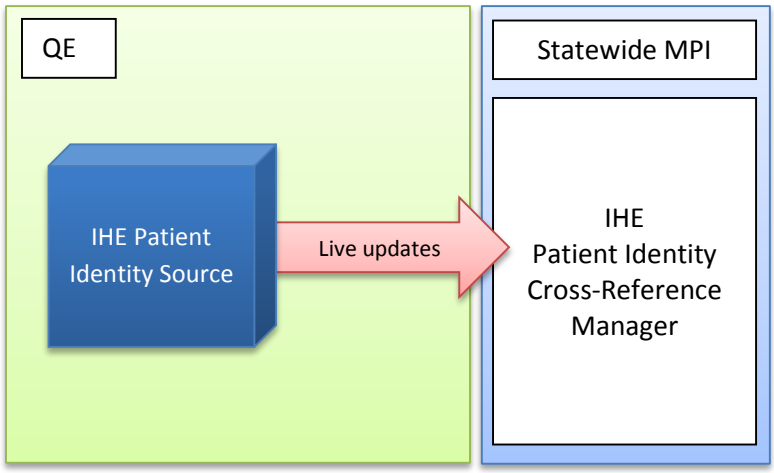


Figure 2 Live PIXv3 Feed to sMPI

QEs not implementing batch incremental updates to the sMPI shall use these real-time PIX v3 transactions to send updates of their patient population to the sMPI.

Querying the sMPI - PIXv3 Query

After a successful data feed, any QE may query the Statewide MPI using a PIXv3 Query transaction to discover patient identifiers from other QEs. The

Request	Response
Initiating QE includes a Patient ID and its Assigning Authority OID	PIXv3 (sMPI) responds with all known Patient IDs.

Patient Record Lookup- Document Query and Retrieval

There are many transaction patterns that can be used for QEs to query and retrieve documents from other QEs, including:

- **Peer-to-peer XCPD & XCA:** QEs query for patient identity using XCPD transactions and query and retrieve documents using XCA transactions.
- **XCA query to sXCA gateway:** QEs query the statewide XCA gateway, which query the appropriate QEs, and return aggregated list of documents.
- **XCPD query to sXCPD + XCA query to sXCA gateway:** QEs query the statewide XCPD gateway, which query the sMPI, the appropriate QEs, and return aggregated list of patients. Initiating QE then proceeds to query the statewide XCA gateway for documents and retrieval.

- **PIX query to sMPI + peer-to-peer XCA:** QEs query the sMPI using PIXv3 query to get patient identifier in other QEs, then proceed to peer-to-peer document query and retrieval using XCA directly between QEs.
- **XCPD query to sXCPD + peer-to-peer XCA:** QEs query the statewide XCPD gateway, which query the sMPI, the appropriate QEs, and return aggregated list of patients. Initiating QE then proceeds to peer-to-peer XCA query for documents and retrieval.

The first model does not leverage a statewide MPI or any other statewide service and will not be covered by this document. The following sections discuss the other options in more details.

Option 1: XCA via Statewide XCA Gateway

In this option the Statewide XCA Gateway is used to facilitate patient record look up among QEs.

Use Case

QE initiates patient record look up to the sXCA gateway using local patient identifier from the QE. The statewide XCA leverages the SMPI to identify other QEs that have the patient and queries those communities. The sXCA gateway then returns an aggregated document list to the initiating QE, which can proceed to document retrieval using XCA document retrieval.

Applicable Actors and Transactions

The table below shows the IHE transactions used in this approach and the IEH actor each party assumes.

Profile	Implemented By	Actor	Transaction(s)
XCA	Statewide Services	XCA Initiating Gateway XCA Responding Gateway	Cross Gateway Query Cross Gateway Retrieve
XCA	QE	Document Consumer XCA Initiating Gateway XCA Responding Gateway	Cross Gateway Query Cross Gateway Retrieve

Request Flow

The following diagram illustrates the actors and transactions involved in this patient record lookup option.

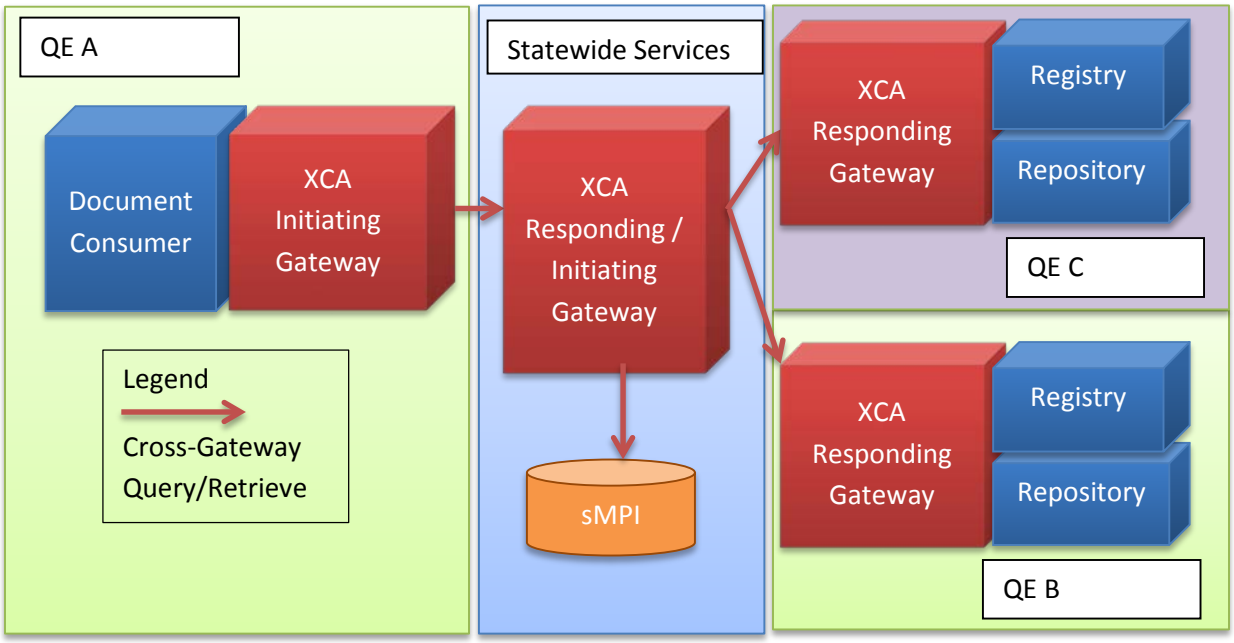


Figure 3 Patient Record Lookup with sXCA

The table below highlights steps of the transaction flow and the functions required for each actor.

Party	Functions required
Originating QE	XCA Initiating Gateway performs a Cross Gateway Query to the Statewide XCA Responding Gateway using either a sMPI ID for the patient previously looked up, or the Local Patient ID from the QE, with the Initiating QE's Assigning Authority OID. The query may be any valid XCA Cross-Community query, including queries for On Demand Documents. **XCA Request [Initiating QE → Statewide Services]** • **$XDSDocumentEntryPatientId**: sMPI Patient ID or Initiating QE patient ID • **SAML:** SAML attributes populated and signed by initiating QE. • **Time Stamp:** initiating QE timestamp, signed by initiating QE
Statewide Services	Statewide XCA Responding Gateway receives a Cross Gateway Query. The sXCA leverages the SMPI to identify the QEs that have the patient and resolve Patient IDs for these QE's Assigning Authority OIDs, excluding the Initiating QE AA OID.
	Statewide XCA Initiating Gateway re-broadcasts original request to other QE's that have the patient. The original SAML will be carried across, but the digital signatures on the message (timestamp, SAML) can be re-signed using the Statewide certificate to simplify trust management for QEs.
	XCA Requests [Statewide Services → Responding QE(s)]

Party	Functions required
	• **$XDSDocumentEntryPatientId**: Responding QE patient ID • **SAML:** SAML attributes as populated by initiating QE, signed by Statewide Services. • **Time Stamp:** Statewide Services timestamp, signed by Statewide Services.
Other QEs	Other QEs XCA Responding Gateway receives the Cross Gateway Query from the sXCA and services the request. QEs in the statewide exchange can all produce on-demand CCD for patient. For statewide patient record look up, responding QEs will include on-demand CCD in document query responses, as long as query parameters from the initiating QE does not preclude this. **XCA Response [Responding QE →Statewide Services]:** • **Document Entries**: matching documents from the QE. o Each entry's "**home"** attribute value is the homeCommunityId of the responding QE in URI syntax (of the form "urn:oid:*n.n.n.n*"). o Each entry has **repositoryUniqueId** and **XDSDocumentEntry.uniqueId** to identify the document and the repository holding it. o Each entry will have the appropriate **objectType** attribute value to distinguish stable document entries and on-demand document entries. • **SAML:** N/A. • **Time Stamp:** N/A.
Statewide Services	After the Statewide XCA Initiating Gateway gets all responses from responding QEs, the metadata objects will be merged into a single response and sent back to the Originating QE's XCA Initiating Gateway. As some QEs currently are expecting document entries returned by one responding gateway to have only one homeCommunityId value from that responding gateway, the sXCA service will replace homeCommunityId values from responding QEs with that for Statewide Services. The sXCA service will add the responding QE's name to the authorInstitution rim slot of each document entry, if it's not already present there, to indicate the source community of the document. **XCA Response [Statewide Services →Initiating QE]:** • **Document Entries**: matching documents from all QEs that returned data. o Each entry's "**home"** attribute value is the homeCommunityId of Statewide Services in URI syntax (of the form "urn:oid:*n.n.n.n*"). o Each entry will have an "**authorInstitution"** rim slot value that contains the responding QE's name as one of the values.

Party	Functions required
	○ Each entry has **repositoryUniqueId** and **XDSDocumentEntry.uniqueId** to identify the document and the repository holding it. ○ Each entry will have the appropriate **objectType** attribute value to distinguish stable document entries and on-demand document entries • **Partial Success Case:** If some of the responding QEs return error or fail to respond, the **AdhocQueryResponse** status will be "urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:PartialSuccess", and each error will be returned under **RegistryErrorList** as an **RegistryError.** • **SAML:** N/A. • **Time Stamp:** N/A.
Originating QE	The Originating QE may now perform a Cross Gateway Retrieve to get any documents of interest returned in the XCA query response in the previous step. This may be immediate, after a delay or may not occur, depending on the choices made by any operators (automated or live). The Originating QE can resolve the XCA retrieve endpoint for a given document by leveraging the **home** attribute of the document entry. The **home** attribute for document entries returned from the sXCA service is the homeCommunityId of the Statewide Services and should point to the sXCA retrieve end point. The Statewide XCA gateway, upon receiving XCA retrieve request from originating QE, will determine the source QE for each document based on the RepositoryUniqueId for the document and forward the retrieve request to appropriate responding QEs and aggregate the responses back. **XCA Retrieve Request [Initiating QE → Statewide Services]** • **Document(s) to Retrieve:** A list of DocumentRequest for documents of interest. Each DocumentRequest Has: ○ **HomeCommunityId:** Statewide Services homeCommunityId, as returned in the XCA query response from the sXCA service to the originating QE (home attribute on each document), in URI syntax (of the form "urn:oid:*n.n.n.n*"). ○ **RepositoryUniqueId & DocumentUniqueId**, as returned in XCA query response received above. • **SAML & Timestamp:** same as that for XCA Query from initiating QE to Statewide Services. **XCA Retrieve Request [Statewide Services → Responding QE]** The Statewide Services resolves Responding QE based on the RepositoryUniqueId in the retrieve request. It determines the end points for XCA retrieve for each responding QE, and forward the XCA retrieve requests

Party	Functions required
	to the Responding QE with request for documents from that QE. Request to each Responding QE contains: • **Document(s) to Retrieve:** A list of DocumentRequest for documents of interest from that Responding QE. Each DocumentRequest has: o **HomeCommunityId:** responding QE's homeCommunityId, as determined by the sXCA services, in URI syntax (of the form "urn:oid:*n.n.n.n*"). o **RepositoryUniqueId & DocumentUniqueId,** as sent by the initiating QE. • **SAML & Timestamp:** same as that for XCA Query from Statewide Services to Responding QE. **XCA Retrieve Response [Responding QE → Statewide Services]** • Requested document(s) from the responding QE; and/or errors in the QueryResponse element under RegistryErrorList as RegistryError. • SAML & Timestamp: N/A **XCA Retrieve Response [Statewide Services → Initiating QE]** • All requested document(s) from all responding QEs in the retrieve request. • **Partial Success Case:** If some of the responding QEs return error or fail to respond, the error will be returned in the QueryResponse element under RegistryErrorList as RegistryError. • SAML & Timestamp: N/A

Option 2: sXCPD + sXCA

With this option, the QEs performs patient demographics query with the sXCPD gateway, then proceed to document query and retrieval with the sXCA gateway.

Use Case:

QE initiates a patient demographic query to the sXCPD service, which queries the sMPI, and other QEs if needed, and returns an aggregated list of patients. The initiating QE determines the patient of interest and queries the statewide XCA gateway for documents. A demographics query is appropriate in cases such as a new patient who does not yet have a patient record in the QE, or a new patient record in the QE has not been sent to the sMPI. [1]

[1] QEs can determine the best approach/workflow to handle new patient in the QE, provided the QE ensures queries for such patients are appropriate based on factors such as patient consent, user role, and other applicable policies.

Applicable Actors and Transactions

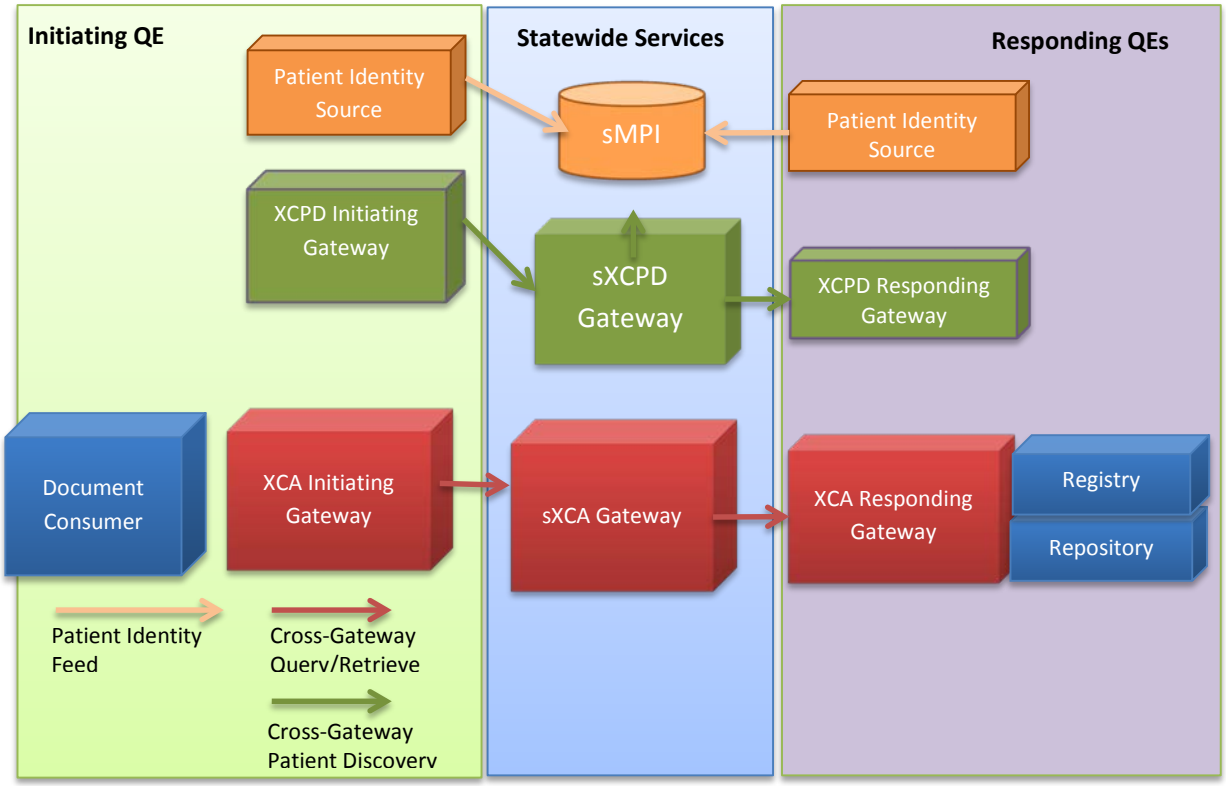
The table below shows the IHE transactions used in this approach and the IEH actor each party assumes.

Profile	Implemented By	Actor	Transaction(s)
XCPD	Originating QE Other QE	Initiating Gateway Responding Gateway	Cross Gateway Patient Discovery
XCPD	Statewide Services	Initiating Gateway Responding Gateway	
XCA	QE	Document Consumer XCA Initiating Gateway XCA Responding Gateway	Cross Gateway Query Cross Gateway Retrieve
XCA	Statewide Services	XCA Initiating Gateway XCA Responding Gateway	Cross Gateway Query Cross Gateway Retrieve

Request Flow

The diagram below illustrates the actors and transactions involved in this patient record lookup option.

Figure 4 Patient Record Lookup with sXCAP and sXCA



The table below highlights steps of the transaction flow and the functions required for each actor.

Party	The functions required

Originating QE	XCPD Initiating Gateway performs a Cross-Community Patient Discovery Query to the Statewide XCPD Responding Gateway using patient demographic data, which may include the Local Patient ID if available, and Initiating QE's Assigning Authority OID.
	
	XCPD Query Request [Initiating QE → Statewide Services]
	• **sender\device\..\representedOrganization\id:** Initiating QE homeCommunityId.
	• **sender\device\id:** initiating QE sending device ID.
	• **receiver\device\id:** Statewide Services receiver device ID.
	• **Query Parameters:**
	  o Patient demographics (name, DOB, gender…)
	  o Initiating QE patient ID as LivingSubjectId.
	• **SAML:** SAML attributes populated and signed by initiating QE.

Party	The functions required
	• **Time Stamp:** initiating QE timestamp, signed by initiating QE
Statewide Services	Statewide XCPD Responding Gateway receives a Cross-Community Patient Discovery Query. The sXCPD Gateway can leverage the SMPI to identify the QEs that have the patient and resolve Patient IDs for these QE's Assigning Authority OIDs, excluding the Initiating QE AA OID.
	For QEs that do not have entry for the patient in the sMPI and do not have real-time patient update to the sMPI, the Statewide XCPD Initiating Gateway forwards patient discovery request to these QEs to check if the patient has been added in the QE since the last sMPI update. The original SAML may be carried across, but the digital signatures on the message (timestamp, SAML) can be re-signed using the Statewide certificate to simplify trust management for QEs.

	XCPD Requests [Statewide Services → Responding QE(s)]
	• **sender\device\..\representedOrganixation\id:** Initiating QE homeCommunityId.
	• **sender\device\id:** Statewide Services device ID.
	• **receiver\device\id:** Responding QE's device ID.
	• **Query Parameters:** as sent by Initiating QE
	  o Patient demographics (name, DOB, gender…)
	  o Initiating QE patient ID as LivingSubjectID
	• **SAML:** SAML attributes as populated by initiating QE, signed by Statewide Services.
	• **Time Stamp:** Statewide Services timestamp, signed by Statewide Services.

Other QEs	Other QEs XCPD Responding Gateway receives the Cross-Community Patient Discovery Query from the sXCPD and services the request. The patient's ID in the responding QE will be returned.
	
	XCPD Response [Responding QE → Statewide Services]
	• **sender\device\id:** Responding QE device ID.
	• **receiver\device\id:** Statewide Services device ID.
	• **Matching patients:** only ONE subject entry per assigning authority. Each entry contains:
	  o Patient demographics (name, DOB, gender…)
	  o Responding QE patient ID as **patient\id**, with the QE's assigning authority ID as **root**. QE name can be returned as the **assigningAuthorityName** attribute of the id. If a QE does not return an assigningAuthorityName, the sXCPD service will add the attribute in the next step.

Party	The functions required
	○ Responding QE's homeCommunityId is specified as **regitrationEvent\custodian\assignedEntity\id**. The home community name can be returned in the **assignedOrganization\name** element within the assignedEntity. • **SAML:** N/A. • **Time Stamp:** N/A.
Statewide Services	After the Statewide XCPD Initiating Gateway gets all responses from responding QEs, the metadata objects will be merged into a single response and sent back to the Originating QE's XCPD Initiating Gateway. Each patient candidate entry returned will carry either a patient's sMPI ID or a patient ID from a responding QE. **XCPD Response [Statewide Services → Initiating QE]** • **sender\device\id:** Statewide Services device ID. • **receiver\device\id:** Initiating QE device ID. • **Matching patients:** matching patients from all responding QEs' responses, and those from the sMPI. Only ONE entry per assigning authority. Each entry contains: ○ Patient demographics (name, DOB, gender…) ○ sMPI Patient ID or a Responding QE's patient ID as **patient\id**, with the QE's assigning authority ID as the **root** attribute, and QE name as the **assigningAuthorityName** attribute. ○ homeCommunityId of the statewide services as **registrationEvent\custodian\assignedEntity\id,** and name of the responding QE as **representedOrganization\name** within the assignedEntity. • **Partial Success Case:** If some of the responding QEs return error or fail to respond, the **acknowledgement\typeCode** will return a code of **"AE"**, and the error details will be returned under **acknowledgement\acknowledgementDetail** with a **typeCode** value of **"E".** The matching patient entries will still be returned as described above. • **SAML:** N/A. • **Time Stamp:** N/A.
Originating QE	The Originating QE may select the patient of interest and proceed to perform a Cross Gateway Query (XCA) query to the statewide XCA gateway for data of interest. The originating QE can resolve the XCA query end point of a selected patient either by leveraging the assigning authority ID of the selected patient, which should all map to the sXCA gateway query end point, or the homeComunityId returned in the custodian element of the patient, which points to the sXCA gateway.

Party	The functions required
	Use the patient's sMPI ID to query for information from all responding QEs. Use a patient's ID from a particular QE to query for information from a particular QE. **XCA Request [Initiating QE → Statewide Services]** • **$XDSDocumentEntryPatientId**: ID of the patient of interest from the responding QE or the patient's sMPI ID, as returned in the XCPD response. • **SAML:** SAML attributes populated and signed by initiating QE. • **Time Stamp:** initiating QE timestamp, signed by initiating QE

Option 3: PIX Query to sMPI + Direct QE to QE XCA

In this option the document query and retrieval portion of the patent record lookup transaction is not facilitated by a statewide XCA service. QEs use PIXv3 query to the sMPI to discover patient identity in other QEs. Clinical document query and retrieval transactions are performed directly among QEs using IHE XCA services patient identity discovery.

With this option, the QEs need to maintain knowledge about other QE's XCA end points and certificate information. When new QEs onboard onto the network, existing QEs will need to update their system to be able to query the new QEs.

Use Case: Statewide MPI PIXv3 Patient ID Lookup + QE to QE XCA

For an existing patient in the community whose patient record has been sent to the sMPI, QE initiates a patient identifier look up to the sMPI using PIXv3 query and discovers patient identifier from other communities. The initiating QE resolves target QEs to query and proceed to query each.

Applicable Actors and Transactions

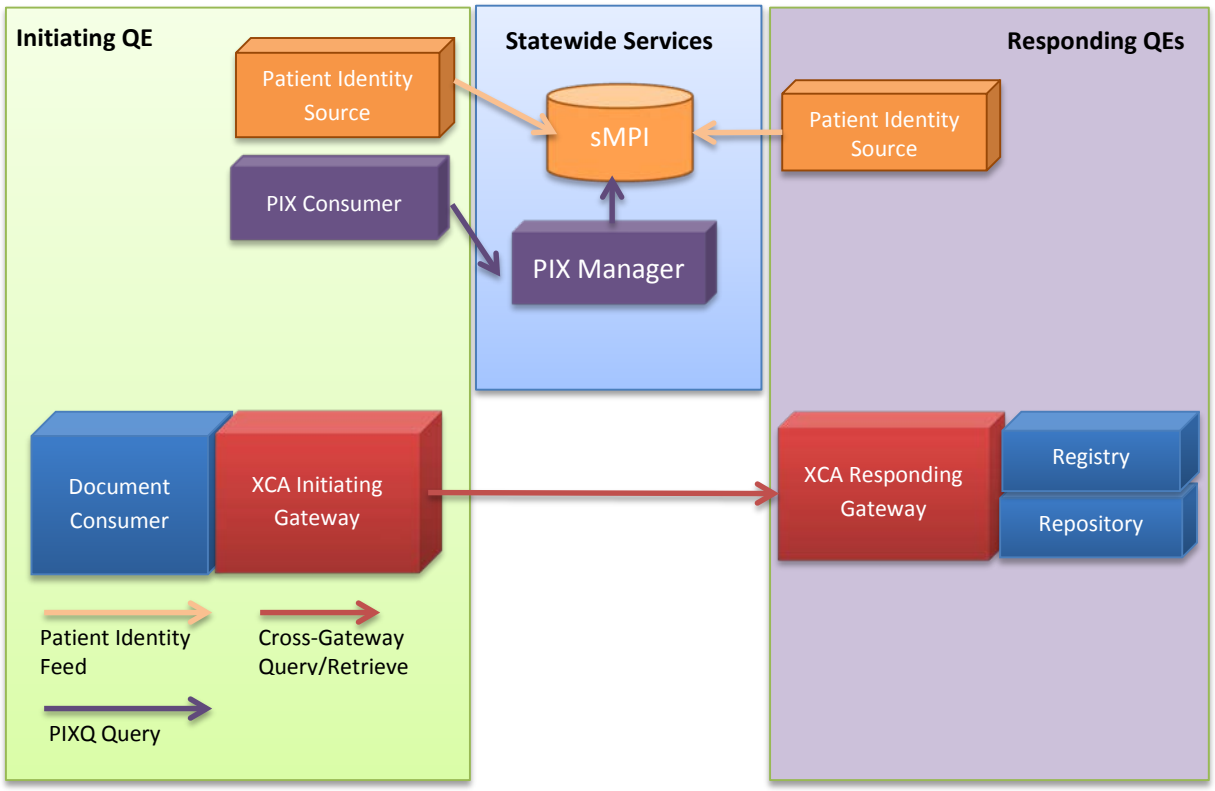
The table below shows the IHE transactions used in this approach and the IEH actor each party assumes.

Profile	Implemented By	Actor	Transaction(s)
PIXv3	Statewide Services	Patient Identifier Cross-Reference Manager	PIXv3 Query
PIXv3	Originating QE	Patient Identifier Cross-Reference Consumer	PIXv3 Query
XCA	Originating QE Other QE	XCA Initiating Gateway XCA Responding Gateway	Cross Gateway Query Cross Gateway Retrieve

Request Flow

The diagram below illustrates the actors and transactions involved in this patient record lookup option.

Figure 5 PIX Query to sMPI & QE to QE XCA



The table below highlights steps of the transaction flow and the functions required for each actor.

Party	The functions required
Originating QE	Perform PIXv3 Query to Statewide MPI to discover matching Patient IDs in other QEs. **PIX Query Request [Initiating QE → Statewide Services]** • **patientIdentifier** parameter: Initiating QE patient ID • **SAML:** SAML attributes populated and signed by initiating QE. • **Time Stamp:** initiating QE timestamp, signed by initiating QE
Statewide Services	PIXv3 Query response containing all matching IDs from other QEs **PIX Query Response [Statewide Services → Initiating QE]** • Matching patient as a "subject" entry where QE's IDs for the patient are returned as "patient\id" entries under the "subject". Each patient ID entry has a root and extension, where the root is the assigning authority OID of the QE.

Party	The functions required
	• **SAML:** N/A • **Time Stamp:** N/A
Originating QE	Resolves XCA end points for responding QEs based on patient IDs received in the PIX query response above.
	Perform XCA Cross Gateway Query for documents to each Other QE of interest (typically ones that have matching Patient IDs) The query may be any valid XCA query, including queries for On Demand Documents. **XCA Requests [Initiating QE → Responding QE(s)]** • **$XDSDocumentEntryPatientId**: Responding QE patient ID • **SAML:** SAML attributes as populated by initiating QE, signed by initiating QE. • **Time Stamp:** Initiating QE timestamp, signed by initiating QE.
Other QE	Other QEs XCA Responding Gateway will get the Cross Gateway Query and service the request. The Other QE may or may not respond with On Demand Document metadata if the original request suggested so. **XCA Response [Responding QE →Initiating QE]:** • **Document Entries**: matching documents from the QE. o Each entry's "**home"** attribute value is the homeCommunityId of the responding QE in URI syntax (of the form "urn:oid:*n.n.n.n*"). o Each entry has repositoryUniqueId and XDSDocumentEntry.uniqueId to identify the document and the repository holding it. o Each entry will have the appropriate **objectType** attribute value to distinguish stable document entries and on-demand document entries • **SAML:** N/A. • **Time Stamp:** N/A.
Originating QE	The Originating QE may now perform a Cross Gateway Retrieve to get any documents of interest. This may be immediate, after a delay or may not occur, depending on the choices made by any operators (automated or live). **XCA Retrieve Request [Initiating QE → Responding QE]** • **Document(s) to Retrieve:** A list of DocumentRequest for documents of interest from that Responding QE. Each DocumentRequest has: o **HomeCommunityId:** responding QE's homeCommunityId, as returned in XCA query response (home attribute on each document) received above, in URI syntax (of the form "urn:oid:*n.n.n.n*"). o **RepositoryUniqueId & DocumentUniqueId**, as returned in XCA query response received above.

Party	The functions required
	• **SAML & Timestamp:** same as that for XCA Query from Initiating QE to Responding QE. **XCA Retrieve Response [Responding QE → Initiating QE]** • Requested document(s) from the responding QE. • **SAML & Timestamp:** N/A

Option 4: Patient Identity Lookup Using sXCPD + QE to QE XCA

Similar to Option 2, in this option, the document query and retrieval portion of the patent record lookup transaction is peer-to-peer between QEs instead of being facilitated by a statewide XCA service. Unlike pure peer-to-peer QE transactions where patient discovery is via peer-to-peer XCPD, a statewide XCPD gateway facilitates patient discovery among QEs.

With this option, the QEs performs patient demographics query only with the sXCPD gateway, but still need to maintain knowledge about other QE's XCA end points and certificate information.

Use Case:

QE initiates a patient demographic query to the sXCPD service, which queries the sMPI and other QEs if needed, and returns an aggregated list of patients. The initiating QE selects the patient of interest, resolves target QEs to query and proceed to query each. A demographics query is appropriate in cases such as a new patient who does not yet have a patient record in the QE, or a new patient record in the QE has not been sent to the sMPI.[2]

Applicable Actors and Transactions

The table below shows the IHE transactions used in this approach and the IEH actor each party assumes.

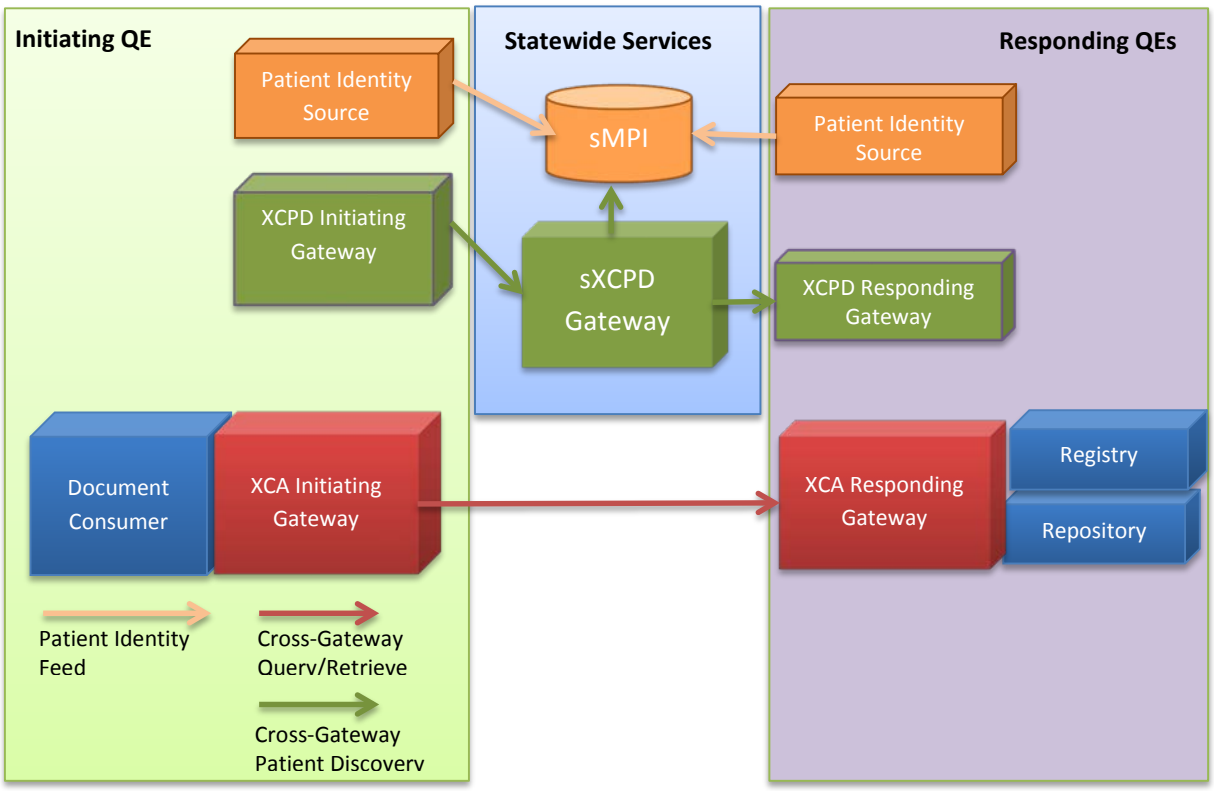
Profile	Implemented By	Actor	Transaction(s)
XCPD	Originating QE Other QE	Initiating Gateway Responding Gateway	Cross Gateway Patient Discovery
XCPD	Statewide Services	Initiating Gateway Responding Gateway	
XCA	Originating QE Other QE	XCA Initiating Gateway XCA Responding Gateway	Cross Gateway Query Cross Gateway Retrieve

[2] QEs can determine the best approach/workflow to handle new patient in the QE, provided the QE ensures queries for such patients are appropriate based on factors such as patient consent, user role, and other applicable policies

Request Flow

The diagram below illustrates the actors and transactions involved in this patient record lookup option.

Figure 6 Patient ID Lookup via sXCPD & QE to QE XCA



The table below highlights steps of the transaction flow and the functions required for each actor.

Party	The functions required
Originating QE	XCPD Initiating Gateway performs a Cross-Community Patient Discovery Query to the Statewide XCPD Responding Gateway using patient demographic data, which may include the Local Patient ID if available, and Initiating QE's Assigning Authority OID **XCPD Query Request [Initiating QE → Statewide Services]** • **sender\device\..\representedOrganization\id:** Initiating QE homeCommunityId. • **sender\device\id:** Initiating QE's sender device ID. • **receiver\device\id:** Statewide Services receiver device ID. • **Query Parameters:** o Patient demographics (name, DOB, gender…)

Party	The functions required
	○ Initiating QE patient ID as LivingSubjectId: the root portion of the ID is the Initiating QE's assigning authority ID, and the extension portion is the patient's ID. • **SAML:** SAML attributes populated and signed by initiating QE. • **Time Stamp:** initiating QE timestamp, signed by initiating QE
Statewide Services	Statewide XCPD Responding Gateway receives a Cross-Community Patient Discovery Query. The sXCPD Gateway can leverage the SMPI to identify the QEs that have the patient and resolve Patient IDs for these QE's Assigning Authority OIDs, excluding the Initiating QE AA OID.
	For QEs that do not have an entry for the patient in the sMPI and do not have real-time patient update to the sMPI, the Statewide XCPD Initiating Gateway forwards the XCPD request to other QE's to check if they have the patient. The original SAML may be carried across, but the digital signatures on the message (timestamp, SAML) can be re-signed using the Statewide certificate to simplify trust management for QEs.
	XCPD Requests [Statewide Services → Responding QE(s)] • **sender\device\..\representedOrganization\id:** Initiating QE homeCommunityId. • **sender\device\id:** Statewide Services device ID. • **receiver\device\id:** Responding QE's device ID. • **Query Parameters:** as sent by Initiating QE ○ Patient demographics (name, DOB, gender…) ○ Initiating QE patient ID as LivingSubjectID • **SAML:** SAML attributes as populated by initiating QE, signed by Statewide Services. • **Time Stamp:** Statewide Services timestamp, signed by Statewide Services.
Other QEs	Other QEs XCPD Responding Gateway receives the Cross-Community Patient Discovery Query from the sXCPD and services the request. The patient's ID in the responding QE will be returned. **XCPD Response [Responding QE → Statewide Services]** • **sender\device\id:** Responding QE device ID. • **receiver\device\id:** Statewide Services device ID. • **Matching patients:** only ONE entry per assigning authority. Each entry contains: ○ Patient demographics (name, DOB, gender…) ○ Only 1 ID per patient: Responding QE patient ID as **patient\id**, with the QE's assigning authority ID as **root**. QE name can be returned as the **assigningAuthorityName** attribute of the id. If a QE does not return an assigningAuthorityName, the sXCPD service will add the attribute in the next step.

Party	The functions required
	○ Responding QE's homeCommunityId is specified as **regitrationEvent\custodian\assignedEntity\id**. The home community name can be returned in the **assignedOrganization\name** element within the assignedEntity. • **SAML:** N/A. • **Time Stamp:** N/A.
Statewide Services	After the Statewide XCPD Initiating Gateway gets all responses from responding QEs, the metadata objects will be merged into a single response and sent back to the Originating QE's XCPD Initiating Gateway. Each patient candidate entry returned will carry either a patient's sMPI ID or a patient ID from a responding QE. **XCPD Response [Statewide Services → Initiating QE]** • **sender\device\id:** Statewide Services device ID. • **receiver\device\id:** Initiating QE device ID. • **Matching patients:** matching patients from all responding QEs' response, and those from the sMPI. Only ONE entry per assigning authority. Each entry contains: ○ Patient demographics (name, DOB, gender…) ○ sMPI patient ID or Responding QE's patient ID as **patient\id**, with the QE's assigning authority ID as the **root** attribute, and QE name as the **assigningAuthorityName** attribute. ○ homeCommunityId of the statewide services as **registrationEvent\custodian\assignedEntity\id,** and name of the responding QE as **representedOrganization\name** within the assignedEntity. • **Partial Success Case:** If some of the responding QEs return error or fail to respond, the **acknowledgement\typeCode** will return a code of **"AE"**, and the error details will be returned under **acknowledgement\acknowledgementDetail** with a **typeCode** value of **"E".** The matching patient entries will still be returned as described above. • **SAML:** N/A. • **Time Stamp:** N/A.
Originating QE	The Originating QE may now perform a Cross Gateway Query (XCA) to the other QEs using the patient ID from the other QE, and retrieve data of interest. Using the assigning authority of the Patient IDs returned in the XCPD response, Initiating QE resolves XCA end points for Responding QEs of interested and proceeds to XCA query and retrieve.

Comparison of Options

The table below highlights the pros and cons for the Patient Record Lookup options described above. Note these options are not mutually exclusive. They can be used in conjunction with each other for different use cases.

The statewide services (sMPI. sXCA, sXCPD) help to optimize patient record lookup transactions. More details on these services will be covered in the implementation guide for statewide connections later.

Options 1 and 2 are closer to what most QE's current workflow and are the recommended approaches for patient record lookup. Options 3 and 4 are alternate approaches that may be supported by QEs if these are a better fit to the QEs current capability.

QEs pursuing peer to peer transactions need to maintain necessary technical settings (configurations and connections) on a peer to peer basis.

"Standard" and "Alternative" Approaches

Options 1 and 2 are considered to be the "standard" approach and options 3 and 4 are considered to be an "alternative" approach. Both approaches are considered to be in compliance. At a minimum, all QEs must develop their solution to meet the "standard" approach and will be tested against this for certification. QEs are not required to develop a solution that meets the "alternative" approach (as it is optional). QEs will only be tested against the "alternative" approach for certification only if that QE has implemented that approach.

Note: QEs choosing to use the "alternative" approach must abide by the data sharing agreements set forth in the QEPA and cannot deny distribution or receipt of data to/from a QE because that QE is using the "standard" approach. Additionally, QEs choosing to use the "standard" approach, but also having implemented the "alternative" approach, must abide by the data sharing agreements set forth in the QEPA and cannot deny distribution or receipt of data to/from a QE because that QE is using the "alternative" approach. .

Option	Pros	Cons
1. sXCA	• Leverages sMPI for patient resolution • Simplify connectivity and reduce certificate configuration among QEs • Gateway performs intelligent logic to reduce complexity at edge systems • QEs only has to perform 1 transaction and only has to maintain connection to the sXCA	More development effort to build out the sXCA service compared to peer-to-peer XCA.
2. sXCPD + sXCA	• Same as 1 + 4 For most QEs, this is close to what the application can currently do	• Development work for sXCPD and sXCA services
3. PIX to sMPI + Peer to Peer XCA	Only relies on sMPI and its PIX manager service	• 2 transactions for initiating QE • QEs have to maintain XCA information for all other QEs as well as managing trust

Option	Pros	Cons
4. sXCPD + Peer to Peer XCA	XCPD transaction allows discovery of patients that are not yet in the initiating QE or sMPI	• 2 transactions for initiating QE • QEs have to maintain XCA information for all other QEs as well as managing trust • Development work to build sXCPD service

On-demand CCD

On-demand CCD is becoming an important means for getting consolidated data on patients. QEs in the statewide exchange can all produce on-demand CCD for patient. However, some systems lack support for initiating a query for on-demand document. For statewide patient record look up, responding QEs will include on-demand CCD in document query responses, as long as query parameters from the initiating QE does not preclude this.

On-demand CCDs generated by the QEs shall have the proper redisclosure warning. (See section on "Redisclosure Warning"). As stable documents provided by data sources may not have the proper redisclosure warning currently, they will not be included in the current Statewide Patient Record Lookup (sPRL) transactions. Only on-demand CCDs will be exchanged at the current stage.

In order to exclude stable documents from sPRL transactions, XCA query to a responding QE shall restrict the XDSDocumentEntryType parameter to only that for on-demand document. An example of the query parameter is:

```
<rim:Slot name="$XDSDocumentEntryType">
   <rim:ValueList>
      <rim:Value>('urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248')</Value>
   </rim:ValueList>
</rim:Slot>
```

For initiating QEs that uses the sXCA service, the sXCA service will add the restriction above automatically.

For initiating QEs that uses direct XCA transaction with other QEs, the above restriction shall be implemented so that only on-demand documents are requested.

Responding QEs shall respect the document entry type restriction in incoming XCA queries and return only on-demand documents.

Currently all QEs can generate and consume HITSP C32 CCD documents, whereas support for Consolidated CDA (CCDA) documents are not universal. As a result, for the current phase of sPRL transactions, only C32 documents will be exchanged.

Security and Authorization Framework

For IHE transactions used in patient record lookup, the security and authorization framework will leverage the following:

- 2-way TLS for transport security,
- SAML and WS-security for message level security, as well as for authorization.

SAML

SAML will be used to carry information on the transaction initiator, including user, user role, user organization, QE, purpose of use. Attributes in SAML will be the basis for a responding QE to make the appropriate decision on patient information release, if needed, and also for keeping audit trails for patient information release.

There are differences among the SHINNY specification on security, eHealth Exchange security framework, and the latest IHE specification. Appendix B is a comparison of the differences.

The technical group reviewed the differences in detail and determined the SAML attributes from the eHealth Exchange security and authorization framework meet the needs for the use cases for statewide connection. Switching to use the eHealth Exchange specification on SAML will align the two specifications and improve interoperability.

Refer to eHealth Exchange's Authorization Framework Production Specification v2.0 for details on SAML elements. Note that the 2010 eHealth Exchange production specification is used here. Implementers are advised to upgrade to use the 2011 eHealth Exchange specification in the future.

The following sections describe the guidelines for SAML attribute statement used in statewide connection transactions.

Note that the Qualified Entity Participation Agreement establishes trust among QEs participating in the statewide exchange. For patient record lookup transactions going to other communities, the following principles apply:

1. The initiating QE is responsible for ensuring a query is initiated only when it's appropriate based on applicable policies, the role of the user, and the purpose of the query.
2. The responding QE relies on the initiating QE's decision on the appropriateness of the query. It may further use information carried in the SAML to determine the appropriate response to the query IF it has additional local policies to enforce.

Purpose of Use

1. The Purpose of Use attribute "urn:oasis:names:tc:xspa:1.0:subject:purposeofuse", where the attribute value is a "PurposeOfUse" child element, will replace the SHINNY "PurposeForUse" attribute.
2. Purpose of Use is a required attribute.

3. The value set for Purpose of Use as defined in the NHIN specification, as listed in the table below, will be used.

Purpose of Use vocabulary	Code
Treatment	TREATMENT
Payment	PAYMENT
Healthcare Operations	OPERATIONS
System Administration	SYSADMIN
Fraud detection	FRAUD
Use or disclosure of Psychotherapy Notes	PSYCHOTHERAP
Use or disclosure by the covered entity for its own training programs	TRAINING
Use or disclosure by the covered entity to defend itself in a legal action	LEGAL
Marketing	MARKETING
Use and disclosure for facility directories	DIRECTORY
Disclose to a family member, other relative, or a close personal friend of the individual,	FAMILY
Uses and disclosures with the individual present.	PRESENT
Permission cannot practicably be provided because of the individual's incapacity or an emergency	EMERGENCY
Use and disclosures for disaster relief purposes.	DISASTER
Uses and disclosures for public health activities.	PUBLICHEALTH
Disclosures about victims of abuse, neglect or domestic violence.	ABUSE
Uses and disclosures for health oversight activities.	OVERSIGHT
Disclosures for judicial and administrative proceedings.	JUDICIAL
Disclosures for law enforcement purposes.	LAW
Uses and disclosures about decedents.	DECEASED
Uses and disclosures for cadaveric organ, eye or tissue donation purposes	DONATION
Uses and disclosures for research purposes.	RESEARCH
Uses and disclosures to avert a serious threat to health or safety.	THREAT
Uses and disclosures for specialized government functions.	GOVERNMENT
Disclosures for workers' compensation.	WORKERSCOMP
Disclosures for insurance or disability coverage determination	COVERAGE
Request of the Individual	REQUEST

4. All QEs shall support at least the following values for Purpose of Use:
    a. **TREATMENT:** for access with patient consent for treatment purposes.
    b. **EMERGENCY:** for "Break the Glass" access under emergency situations by authorized users. **Note** that this value is reserved for "Break the Glass" event only.
    c. **PUBLICHEALTH:** for public health access, that does not require patient consent.
    d. **DONATION:** for organ procurement organization access, that does not require patient consent.
    e. **SYSADMIN**: for QE administrators activities for purposes of system maintenance and testing, troubleshooting and similar operational and technical support purposes.
    f. **(REQUEST)??**

5. QEs currently provide access to data within a QE for public health usage, which does not require patient consent. Patient Record Lookup in statewide connection for public health usage is required and shall use a Purpose of Use value of "**PUBLICHEALTH**". Access to data for public health does not require consent. The initiating QE shall also keep audit logs for the reason for access as required by SHINNY Privacy and Security Policies.
6. QEs will support access to data by Organ Procurement Organizations as specified in the SHINNY Privacy and Security Policies. A Purpose of Use value of "**DONATION**" shall be used for patient record lookup transaction of this type. Access to data for this purpose does not require consent.
7. Per SHINNY Privacy and Security Policies, QE administrators perform activities for purposes of system maintenance and testing, troubleshooting and similar operational and technical support purposes. PRL transactions for such purposes shall have a value of "**SYSADMIN**".
8. QEs supporting patient requests for their own information shall use a purpose of use of "**REQUEST**" when initiating such a query. The initiating QE is responsible to ensure the request is only for information that the patient can have access to, and the query has proper audit logs.
9. Access for disaster tracking purposes currently does NOT apply to statewide patient record look up as it currently depends on relationship between disaster tracking agencies and their local QE. As a result, supporting purpose of use for disaster tracking is out of scope for statewide exchanges at the present time.
10. Consent for Level 2 access is not collected currently but is allowed under the SHINNY Privacy and Security Policies and Procedures and could be implemented by QEs. QEs may support additional values for Purpose of Use such as Level 2 access for "RESEARCH", etc. In general, QEs should work toward providing support for other purpose of use values specified in the table above beyond the minimum set required currently **("TREAMENT", "EMERGENCY" and "PUBLICHEALTH", "DONATION", "SYSADMIN").**
11. Initiating QEs are responsible to ensure that the right value of Purpose of Use is sent in queries.
12. The responding QE will not be required to provide data for a Purpose of Use that is not allowed in its internal policies. (e.g. If the internal policies of the responding QE do not include a consent for Level 2 access for research, that QE would not be required to provide data for a query with that Purpose of Use.)

User Name (Subject ID)

1. The Subject ID attribute "urn:oasis:names:tc:xspa:1.0:subject:subject-id" will replace the SHINNY "UserName" attribute to carry the full name of the individual making the request.
2. Subject ID a required attribute.

User Organization (Subject Organization & Subject Organization ID)

1. The Subject Organization attribute "urn:oasis:names:tc:xspa:1.0:subject:organization" will replace the SHINNY "UserOrganization" attribute.
2. Subject Organization is a required attribute.

3. The value of Subject Organization shall be the human readable name of the organization with which the user making the query is associated.
4. The Subject Organization ID attribute “urn:oasis:names:tc:xspa:1.0:subject:organization-id” will be used to carry the ID of the organization with which the user making the query is associated.
5. Subject Organization ID is a required attribute.
6. The value of Subject Organization ID can be the OID for the organization, using the urn format (that is, “urn:oid” appended with the OID, or a URL assigned to the organization, or a QE assigned ID to the organization.
    a. Implementers are recommended to use OID for Subject Organization ID.
    b. Participating QEs will publish and exchange lists of organizations associated with the QE, with organization name and organization ID, on a regular base to become familiar with possible organizations in the network that may initiate patient record queries. The process for such exchange will be determined by the QEs.
    c. In the case of the same organization being associated with multiple QEs, exchange of organization list will help promote consistency of organization names and IDs among participating QEs.

User Role (Subject Role)

1. The Subject Role attribute “urn:oasis:names:tc:xacml:1.0:subject:role”, where the attribute value is a “Role” child element, will replace the SHINNY “UserCategory” attribute.
2. Subject Role is a required attribute.
3. The Role Element shall contain the SNOMED CT value representing the role that the user is playing when making the request (the codeSystem is “2.16.840.1.113883.6.96" and the codeSystemName is "SNOMED_CT").
4. The value set to be used for the Role element is “User Role” and the OID 2.16.840.1.113883.3.18.6.1.15 as defined in HITSP C80. The list of possible Role codes is provided below.

Concept Code	Concept Name
3842006	Chiropractor
22515006	Medical Assistant
26042002	Dental Hygienist
28229004	Optometrist
36682004	Physiotherapist
46255001	Pharmacist
59944000	Psychologist
61207006	Medical pathologist
76231001	Osteopath
80546007	Occupational therapist
80584001	Psychiatrist
106289002	Dentist
106290006	Veterinarian

Concept Code	Concept Name
106292003	Professional nurse
106311007	Minister of religion AND/OR related member of religious order
106328005	Social worker
106330007	Philologist, translator AND/OR interpreter
112247003	Medical doctor
116154003	Patient
159026005	Speech therapist
159033005	Dietitian
159034004	Podiatrist
159483005	clerical occupation
224546007	Infection control nurse
224570006	Clinical nurse specialist
224571005	Nurse practitioner
224608005	Administrative healthcare staff
224609002	Complementary Healthcare worker
265950004	IT Professional
271554005	law occupation
307785004	insurance specialist (health insurance/payor)
307969004	Public health officer
307988006	Medical Technician
309398001	Profession allied to medicine (non-licensed care giver)
309418004	Audiologist
309428008	Orthotist
397897005	Paramedic/EMT
405278004	Certified registered nurse anesthetist
429577009	Patient advocate

5. Note that for exchange within the SHINNY, user role is currently not used by responding QEs to make decision on information release because of the trust established in the statewide network. As described in SAML section, the initiating QE is responsible for ensuring an outgoing query is appropriate for role a user is playing, and the responding QE relies on that decision by the initiating QE.

   Many QEs currently do not record user role with the same granularity as the table listed above. Each QE will determine how to set the user role attribute with values from the table above as it sees fit, either by mapping locally defined user roles to the standard set or by leveraging more interactive processes such as user attestation. QEs will work to align locally defined user roles and workflows to the standard set.

   Audit logs kept by the QEs for all patient record lookup transactions will be used to help ensure the transactions are appropriate based on the role a user is playing at the time of

the query. As some queries may originate from systems within a QE, initiating QEs should work with such systems to ensure complete audit log trail is available.

6. QEs supporting patient requests for their own information shall use a user role of "Patient" when initiating such a query.
7. Queries from QE administrators for purposes of system maintenance and testing, troubleshooting and similar operational and technical support purposes shall use a user role of "IT Professional".

User RHIO (Home Community ID)

1. The Home Community ID attribute "urn:nhin:names:saml:homeCommunityId" will replace the SHINNY attribute "UserRHIO".
2. Home Community ID is a required attribute.
3. The value of the attribute shall be the OID of the QE that is initiating the query using the urn format (that is, "urn:oid:"appended with the OID).

Patient Identifier (Resource ID)

1. The Patient Identifier attribute "urn:oasis:names:tc:xacml:2.0:resource:resource-id" can be used to carry the patient ID of the patient of interest in the request.
2. Patient Identifier is an OPTIONAL attribute.
3. If populated, the patient identifier value should be that from the initiating QE.

National Provider Identifier (NPI)

1. The National Provider Identifier (NPI) attribute "urn:oasis:names:tc:xspa:2.0:subject:npi" can be used to carry the NPI for the provider initiating the query.
2. NPI is an OPTIONAL attribute.
3. When populated, the NPI value should be that for the individual provider initiating the query.

Subject Confirmation

The holder-of-key SAML subject confirmation method employed by the eHealth Exchange Messaging Platform specification will replace the sender-vouches SAML subject confirmation method employed by previous SHINNY specifications. Refer to NHIN Messaging Platform Production Specification v2.0 for details on SAML subject confirmation processing.

Digital Signature Handling

Following WS-Security and SAML standards, digital signature will be used to authenticate actors involved in the transaction. The elements that need to be signed are those required by WS-Security and SAML profile:

1. Message timestamp
2. SAML assertion

Signature on Body Element

Although digital signature on message body is recommended for non-repudiation, the current eHealth Exchange does not require elements in the message body to be signed. Operationally there are still inconsistencies among implementations when it comes to body signature handling with MTOM enabled. As such, no signature on message body element will be required at this time. Implementers are advised to work toward consistent handling of body signature in the future.

Signature Handling with Statewide Services

As the state services will act as the broker in transactions, there are several transaction patterns for digital signature handling as well:

1. QEs establish trust individually and install each other's certificates. The state service passes signed security artifacts from the initiating QE unchanged to the responding QE(s).
2. QEs trust the statewide services, statewide services re-sign the security artifact with a state signature without altering the SAML content. No point-to-point trust between QE is needed.

For Option 1, the statewide services can maintain a list of certificates from QEs as they onboard to the network, and make them available to other QEs in the system.

However, an operational limitation on the current eHealth Exchange network makes it necessary to use Option 2. The 2011 NHIN specification noted the following:

> Non-normative: Operationally, as per experience to date, the certificate used to establish the 2-way-TLS mutual gateway authentication should be the same as the certificate used to sign <timestamp> and <SAML> apexes of the SOAP message. It is anticipated that these certificates will be different, and participants are advised to build their systems to accept different certificates for the 2-way-TLS purposes and the SOAP message signatures in the future.

Although the transport layer TLS certificate can be different from those used for the signed security elements, many implementation require the two certificates to be the same currently. As a result, when communicating with a statewide service, the security elements in the message header have to be signed with the state service's TLS certificate. This means Option 2 has to be used currently for communicating with statewide services.

Option 1 will be a viable option when implementers can accept different certificates for the 2-way-TLS purposes and the SOAP message signatures in the future.

Consent

There is no statewide consent service to handle consent checking in patient record lookup transaction. Each of the QEs collects patient consent and enforces patient consent, as well as any other applicable policies, locally. For patient record lookup transactions going to other communities, the following principles apply:

3. The initiating QE checks patient consent and policy and will only initiate queries if allowed by consent and policy.

4. The transaction will use SAML to carry user attributes, purpose of use of the transaction, as well as applicable consent information, to inform the target servicing the query to allow them to make security decisions.
5. The target QE responding to a query evaluates information carried in the SAML against local policies and determines the appropriate response to the query.

Audit

All actors involved in statewide patient record lookup transactions, including initiating QEs, statewide services, and responding QEs, shall maintain audit logs to track access to protected patient information (PHI). Auditing shall follow the IHE ATNA profile requirements on auditing. Auditable events and audit log content for each service involved (PIX, XCA, XCPD) are the same as defined by IHE. Batch processing, including sMPI initial load and incremental update using HL7 V2 batch file, will not have ATNA logging.

Below lists the sections in IHE 2013 specifications where audit requirements are defined for actors involved in PIX, XCA, and XCPD transactions.

- **Patient Identity Feed HL7 V3 (ITI-44)**: ITI Technical Framework Volume 2b section 3.44.5.1.
- **PIX V3 Query (ITI-45):** ITI Technical Framework Volume 2b section 3.45.5.1.
- **Cross Gateway (XCA) Query (ITI-38):** ITI Technical Framework Volume 2b section 3.38.4.1.4.
- **Cross Gateway (XCA) Retrieve (ITI-39):** ITI Technical Framework Volume 2b section 3.39.4.1.4.
- **Cross Community Patient Discovery (XCPD) (ITI-55):** ITI Technical Framework Supplement on XCPD section 3.55.5.1.

QEs shall also follow the audit requirements as set in the SHINNY Privacy and Security Policies and Procedures. (Privacy and Security Policies and Procedures for Qualified Entities and their Participants in New York State, Version 3.0, [As of December 13, 2013].)

Initiating QEs' participating organizations, working with the QE, will be responsible for notifying patient of Break the Glass event upon discharge from emergency room, including both events within the QE as well as events that involve Patient Record Lookup (PRL) transactions to other QEs. Note that in statewide PRL transactions, Break the Glass event is flagged by the SAML attribute purposeOfUse having a value of "EMERGENCY". QEs can use additional eventTypeCode in ATNA log to record purposeOfUse. Alternatively, QEs can leverage other logs beyond ATNA logs to satisfy audit and notification requirements on Break the Glass events.

Initiating QEs will also be responsible to notify responding QEs with BTG event information as set out in the SHINNY Privacy and Security Policies and Procedures, including:

1. the name of the Participant that accessed the Protected Health Information;
2. the name of the Authorized User within the Participant that accessed the Protected Health Information;
3. the date and time of the access;
4. the nature of the emergency.

Responding QEs will identify events where data accessed via Break the Glass includes data from a SAMHSA facility (data suppliers that are federally-assisted alcohol or drug abuse programs), and notify

such data suppliers, in accordance with SHINNY Privacy and Security Policies and Procedures. (Data in the sMPI accessed in PRL transactions are at the QE level and do not have any indication whether a patient is from a SAHMSA facility and therefore notification of SAHMSA data source is not needed.)

For public health access to patient data, the initiating QE shall keep audit logs for the reason for access per SHINNY Privacy and Security Policies.

Statewide Services will maintain audit logs as specified above and shall have procedures for QEs to obtain state services audit logs if needed.

Redisclosure Warning

The SHINNY Privacy and Security Policies and Procedures require QEs to provide warning to authorized users on certain types of data such as SAMHSA and HIV/AIDS data. (See section 1.4.3 of the SHINNY Privacy and Security Policies and Procedures on Redisclosure Warning.)

The following standard redisclosure warnings shall be used:

> The records that you are about to access may contain information from federally-assisted alcohol or drug abuse programs. If such information is present, then the following federally mandated warning applies: This information has been disclosed to you from records protected by Federal confidentiality rules (42 CFR part 2). The Federal rules prohibit you from making any further disclosure of this information unless further disclosure is expressly permitted by the written consent of the person to whom it pertains or as otherwise permitted by 42 CFR part 2. A general authorization for the release of medical or other information is NOT sufficient for this purpose. The Federal rules restrict any use of the information to criminally investigate or prosecute any alcohol or drug abuse patient.
>
> The records that you are about to access may contain HIV / AIDS, which is protected under the Article 27 F of the NY Public Health Law. Re-disclosure of this information is subject to NY State and other laws and regulations, with which you must comply.
>
> The records that you are about to access may contain information from facilities licensed or operated by the New York State Office of Mental Health or the New York State Office for People With Developmental Disabilities. Re-disclosure of this information is subject to NY State Mental Hygiene and other laws and regulations, with which you must comply.

As required by the SHINNY Privacy and Security Policies and Procedures, a QE should display such warnings in the QE's clinical viewer before a patient's data is displayed. This is a general requirement for all information displayed in a QE's clinical viewer. No additional warning is needed before a CCD retrieved in statewide PRL is displayed in a QE's clinical viewer.

In addition, on-demand CCDs generated by the QE should also include such warnings in a new section under the structuredBody of the CCD that only has a narrative block containing the warnings. The template ID for this section shall be **2.16.840.1.113883.3.2591.10.1.1**.

```
<component>
   <section>
      <!—NY Redisclosure Notification -->
```

```
      <templateId root="2.16.840.1.113883.3.2591.10.1.1"/>
      <title>Redisclosure Warning</title>
      <text>
            <paragraph>
                  <content ID="ny_redisclosure_warning_samhsa">
                   …
                  </content>
            </paragraph>
            <paragraph>
                  <content ID="ny_redisclosure_warning_hiv">
                   …
                  </content>
            </paragraph>
            <paragraph>
                  <content ID="ny_redisclosure_warning_mental_health">
                   …
                  </content>
            </paragraph>
      </text>
    </section>
</component>
```

It is recommended that this new section be the first section under structuredBody. Receiving system of an CCD containing such a section is recommended to display it as the first part of the body.

Display inside EMR system or communities outside of the SHINNY network is out of scope for the statewide exchange specification.

Implementation Considerations

sMPI Initiate Architecture

There were several QEs contributing best-known records of their patient population to an Initiate MPI. This Initiate MPI will become the sMPI when best-known records from Connect QEs are added.

SMPI Data Governance and Patient Matching

Data governance in the sMPI and patient matching algorithms used to establish identity cross-reference will be handled during the implementation phase of the sMPI and is outside of the scope of this technical approach document.

XCPD Patient Matching

Some QEs send time component in patient's date of birth when initiating an XCPD query. The time component is typically all 0, rather than a real birth time value. Furthermore, patient date of birth in QE MPIs typically does not have time component information. When identifying patient matches in XCPD, a responding QE shall ignore any DOB time component in the query, and return matches where the date is a match.

Service Response Time

Response time for services involved in statewide PRL transactions, including:

1. QE response time for XCA and XCPD services,
2. sMPI response time for PIX query,
3. sXCA response time, which depends on QE XCA response time,
4. sXCPD response time, which depends on QE XCPD response time,

will be handled during the implementation phase. For statewide services that aggregate QE responses, namely sXCA and sXCPD services, there will be a configurable timeout response time beyond which the statewide services will no longer wait for response from a QE and will return the rest of other QE responses. The appropriate value for this time out will be determined during implementation phase.

Data from QEs show response times up to 2 minutes. All QEs have configurable timeout settings for queries initiated by the QE. Taking QE response time, potential latency between QEs and state services, as well as state services processing time, the timeout settings for QE queries will be set at 3 minutes.

QE Services Overviews

This section provides a description of services a QE will support for statewide PRL transactions.

Required: All QEs must support the following transactions:

1. Send initial load of patient data to sMPI via one of the two following options:
    a. sMPI bulk initial load, OR,
    b. PIXV3 Add transactions to sMPI.
2. Send ongoing incremental patient update data to sMPI via one of the two following options:
    a. PIXV2 Patient Identity Feed batch file (A08 and A40 ADT messages in HL7 batch mode), OR,
    b. PIXV3 Add/Update/Duplicate Resolved transactions to sMPI.
3. Respond to XCA query requests from sXCA service. The response shall follow any restriction on document entry type, if it is provided in the XCA query (e.g., restriction to only on-demand document).
4. Respond to XCA retrieve requests from sXCA service.
5. Respond to XCPD requests from sXCPD service.
6. Record auditable events as defined by IHE ATNA for all transactions.

Required for Standard Approaches: QEs supporting the standard approaches of using sXCA and sXCPD to query for patient information will support the following transactions:

1. Initiate XCPD query requests to sXCPD service,
2. Initiate XCA query requests to sXCA service, either using the QE's patient ID or patient ID from other QEs (as returned in XCPD query responses),
3. Initiate XCA retrieve requests to sXCA service, using document information from sXCA query response.

4. Conform to requirements under the “Security and Authorization Framework” section when initiating any PRL transactions, which include:
    a. 2-way TLS for transport security, with the exception of communication between Statewide Services and QEs hosted in the same security zone as Statewide services,
    b. Include SAML token in transactions as required in the SAML section
    c. Use WS-security for message level security, with the exception of communication between Statewide Services and QEs hosted in the same security zone as Statewide services

Required for Alternative Approaches: QEs supporting the alternative approaches of using PIX and sXPD for patient discovery, then peer-to-peer XCA for patent records lookup, will support the following transactions:

1. Initiate PIX query requests to sMPI,
2. Initiate XCPD query requests to sXCPD service,
3. Initiate XCA query requests to other QEs that have patient data, using patient ID from other QEs (retrieved either from a PIX query to the sMPI or an XCPD query to the sXCPD service). The request shall restrict document entry types so that only on-demand documents are requested. (See section on On-demand CCD).
4. Initiate XCA retrieve requests to other QE’s XCA responding gateway, using information from XCA query response from the other QE.
5. Conform to requirements under the “Security and Authorization Framework” section when initiating any PRL transactions, which include:
    a. 2-way TLS for transport security,
    b. SAML and WS-security for message level security, as well as for authorization.

Statewide Services Overview

Statewide Services will support the following PRL transactions.

SMPI: The Statewide MPI will support the following:

1. Receive initial load of patient data to sMPI via one of the two following options:
    a. sMPI bulk initial load, OR,
    b. PIXV3 Add transactions to sMPI.
2. Receive ongoing incremental patient update data to sMPI via one of the two following options:
    a. PIXV2 Patient Identity Feed batch file (A08 and A40 ADT messages in HL7 batch mode), OR,
    b. PIXV3 Add/Update/Duplicate Resolved transactions to sMPI.
3. Respond to PIXV3 query requests from QEs.
4. Record auditable events as defined by IHE ATNA for PIX V3 Identity Feed and PIX V3 query transactions.

sXCPD:

1. Respond to XCPD requests from QEs by performing the following: (The exact sequence and details of the steps may vary at actual implementation time)
    a. Validate XCPD request from initiating QE, including SAML and digital signature validation,
    b. Check sMPI to determine which QEs have the patient of interest and generate XCPD responses on-behalf of those QEs,
    c. For QEs that do not have record for the patient of interest in the sMPI and do not real-time update to the sMPI, resolve XCPD responding gateway information for such responding QEs (QEs other than the initiating QE),
    d. Send XCPD requests to appropriate XCPD responding gateways with the appropriate timestamp and SAML with signature by the state service,
    e. Aggregate responses from XCPD responding gateways and sMPI and return to the initiating QE.
2. Record auditable events as defined by IHE ATNA for all transactions.
3. Conform to requirements under the "Security and Authorization Framework" section when communicating with QE XCPD responding gateways, which include:
    a. 2-way TLS for transport security, with the exception of communication between Statewide Services and QEs hosted in the same security zone as Statewide services,
    b. Include SAML attributes as sent by the initiating QE,
    c. Use WS-security for message level security, with the exception of communication between Statewide Services and QEs hosted in the same security zone as Statewide services

sXCA:

1. Respond to XCA query requests from QEs by performing the following: (The exact sequence and details of the steps may vary at actual implementation time)
    a. Validate XCA request from initiating QE, including SAML and digital signature validation,
    b. Check if the Patient ID in the XCA request from the initiating QE is that from the initiating QE or the sMPI patient ID.
        i. If yes, this is an initiating QE querying for all information on the patient. Proceed to check the sMPI to identify QEs that have data for the patient and obtain patient IDs from these QEs.
        ii. If not, this is an initiating QE querying for information from a specific responding QE. Use the assigning authority of the patient ID to identify the responding QE of interest.
    c. Resolve XCA responding gateway information for the responding QE(s) identified in the step above,
    d. Send XCA requests to the appropriate XCA responding gateway(s) with the QE's patient ID and the appropriate timestamp and SAML with signature by the state

service. Restriction on document entry type will be added to the XCA query to the responding QE to only on-demand documents.

e. Aggregate responses from XCA responding gateway(s) and return to the initiating QE.

2. Respond to XCA retrieve requests from QEs by performing the following: The exact sequence and details of the steps may vary at actual implementation time)
    f. Validate XCA retrieve request from initiating QE, including SAML and digital signature validation,
    g. Check patient ID for each document to retrieve and resolve the source QE of the document,
    h. Resolve XCA responding gateway information for responding QEs identified in the step above,
    i. Send XCA retrieve requests to the appropriate XCA responding gateway(s) with document request list for that QE, along with the appropriate timestamp and SAML with signature by the state service,
    j. Aggregate XCA retrieve responses from XCA responding gateways and return to the initiating QE
3. Record auditable events as defined by IHE ATNA for all transactions.
4. Conform to requirements under the “Security and Authorization Framework” section when communicating with QE XCA responding gateways, which include:
    a. 2-way TLS for transport security, with the exception of communication between Statewide Services and QEs hosted in the same security zone as Statewide services,
    b. Include SAML attributes as sent by the initiating QE,
    c. Use WS-security for message level security, with the exception of communication between Statewide Services and QEs hosted in the same security zone as Statewide services.

Appendix A: MPI Data Sharing

The following is the agreed upon format of the source data for source RHIO for initial load into the sMPI:

Field No.	Field	Priority	Description	Max Len.	Format
1.	**Source***	R	Identifies source of data – Will be a static identifier for the RHIO	40	Text
2.	**Source ID**	R	Unique ID to source *	60	Text
3.	Last Name	1	Patient last name or Organization name	75	Text
4.	First Name	1	Patient first name	30	Text
5.	Middle Name	1	Patient middle name	30	Text
6.	Patient Address Line1	2	Address line 1	50	Text
7.	Patient Address Line 2	2	Address line 2	50	Text
8.	Patient City	2	City	30	Text
9.	Patient State	2	US state code or Canadian province code	2	Text
10.	Patient Zip Code	2	Postal code	10	Text
11.	OTHER Patient Address Line1		Address line 1 - OTHER	50	Text
12.	OTHER Patient Address Line 2		Address line 2 - OTHER	50	Text
13.	OTHER Patient City		City - OTHER	30	Text
14.	OTHER Patient State		State - OTHER	2	Text
15.	OTHER Patient Zip Code		Postal code - OTHER	10	Text
16.	Phone Area – Home [3]phone	2	Area Code – Home Phone	3	XXX (text)
17.	Phone number – Home phone	2	Number – Home Phone	7	Text

[3] Patient phone numbers (home, cell, and work) will be used for matching without differentiating between whether the number is home, cell or work.

Field No.	Field	Priority	Description	Max Len.	Format
18.	Phone Area – Cell phone	2	Area Code – Cell Phone	3	XXX (text)
19.	Phone number – Cell phone	2	Number – CELL PHONE	7	Text
20.	SSN	2	Patient SSN	60	Text **(No dashes)**
21.	Driver License Number		Driver License Number	60	Text
22.	Birth Date	1	Date of Birth	8	YYYYMMDD
23.	Gender	1	Gender (F, M, U, or QE value set[4])	10	Text
24.	Death Indicator		Death Indicator	19	Text
25.	Previous Name		Previous Name / Alias Name	50	Text
26.	Patients Maiden Name		Patients Maiden Name	50	Text
27.	Patients Mother Maiden Name		Patients Mothers Maiden Name	50	Text
28.	Last activity date	R	Last update date of the "golden record" that's being sent to the sMPI	19	YYYYMMDD
29.	Next of Kin		Full Name (Example, John Smith)	128	Text
30.	Phone Area – Next of Kin Phone		Area Code – Next of Kin Phone	3	XXX (text)
31.	Phone number – Next of Kin Phone		Number – Next of Kin Phone	7	Text
32.	Next of Kin Relationship		Next of Kin Relationship	50	Text
33.	Guarantor Last Name		Guarantor Last Name	128	Text
34.	Guarantor First Name		Guarantor First Name	128	Text
35.	Phone Area Code – Guarantor Phone		Area Code – Guarantor Phone	3	XXX (text)

[4] Gender value set from a QE can be mapped to standard value set during the implementation phase.

Field No.	Field	Priority	Description	Max Len.	Format
36.	Phone number – Guarantor Phone		Number – Guarantor Phone	7	Text
37.	Guarantor Relationship		Guarantor Relationship	50	Text
38.	Primary Physician		Primary Physician	50	Text
39.	Registrar		Registrar Name	128	Text
40.	Phone Area Code – Work / Other Phone	2	Phone Area Code – Work / Other Phone	3	XXX (text)
41.	Phone number – Work / Other Phone	2	Number – Work / Other Phone	7	Text
42.	Insurance – Name		Name Of Insured	128	Text
43.	BILLING Patient Address Line1		Address line 1 - BILLING	50	Text
44.	BILLING Patient Address Line 2		Address line 2 - BILLING	50	Text
45.	BILLING Patient City		City - BILLING	30	Text
46.	BILLING Patient State		State - BILLING	2	Text
47.	BILLING Patient Zip Code		Postal code - BILLING	10	Text
48.	Insurance – Relationship		Insured's Relationship To Patient	128	Text
49.	Insurance - Plan ID		Insurance Plan ID	128	Text
50.	Insurance - Company ID		Insurance Company ID	128	Text
51.	Insurance - Company Name		Insurance Company Name	128	Text
52.	Insurance – Company Address		Insurance Company Address	128	Text
53.	Insurance - Company Contact Person		Insurance Company Contact Person	128	Text
54.	Insurance - Company Phone Number		Insurance Company Phone Number	30	Text

Field No.	Field	Priority	Description	Max Len.	Format
55.	Group Number		Group Number	128	Text
56.	Group Name		Group Name	128	Text
57.	Insurance – Group Emp Name		Insured's Group Employer Name	128	Text
58.	Insurance - Plan Effective Date		Insurance Plan Effective Date	23	YYYYMMDD
59.	Insurance - Plan Expiration Date		Insurance Plan Expiration Date	23	YYYYMMDD
60.	Insurance - Plan Type		Insurance Plan Type	128	Text
61.	Insurance - Policy Number		Insurance Policy Number	128	Text
62.	Insurance -Description		Insurance Description	128	Text
63.	Medical Record Number – Issuer		ID Issuer for Medical Record Number (MRN)	12	Text
64.	Medical Record Number – Number		ID Number for Medical Record Number (MRN)	40	Text

* Excludes non-surviving/merged records

Patient Population

QEs should determine the appropriate patient population to share with the sMPI and include records for these patients in the files submitted.

Priority

Patient data field priority is shown in the table above in the “Priority” column. The following is the definition for priority values:

- R: Required, must be included in the file else the record will be rejected.
- 1: Required for minimum matching.
- 2: Used for matching. Should be sent if known.

For data elements without a specified priority value in the table above, QEs may include them in the data sent to the sMPI, depending on local policies and effort required to include such data.

Assumptions:

- Source ID is unique within the source
- Standard data load files for the Initiate™ software are pipe { | } delimited and include one header record with the source and extract date.

- Files are flat and will have CRLF present at the end of each line.
- Files are ASCII unless otherwise specified
- Delimited files require field placement
- All dates are in YYYYMMDD format
- *Max Length* indicates the maximum allowable length for data in the field (excess characters are dropped);

Data Characteristics

Data fields should be:

- Alphanumeric (A) characters, Left-justified
- Numeric (N) digits, Right-justified

File Transfer

Initial bulk load and scheduled incremental batch update data to the sMPI will be transferred using secure FTP. Each QE will obtain an sFTP account from the statewide service and use that to transfer patient data to the sMPI.

Appendix B: SHINNY, eHealth Exchange and IHE Security Comparison

This appendix serves as a comparison between the 2009 SHIN-NY security specification and today's eHealth Exchange specification as it pertains to web services.

References:

SHIN-NY document for comparison:
http://www.nyehealth.org/images/files/File_Repository16/heal5/SHIN-NY_Information_Security_Architecture_Requirements_v1_5.pdf

eHealth Exchange Comparison documents:

http://healthewayinc.org/images/Content/Documents/specs/2010/nhin-authorization-framework-production-specification-v2.0.pdf

http://healthewayinc.org/images/Content/Documents/specs/2010/nhin-messaging-platform-production-specification-v2.0.pdf

SAML Attribute Differences

Attribute	SHIN-NY 2009	eHealth Exchange 2010	IHE 2013
Purpose of use The latest eHealth Exchange specification calls out in an example that there was a version of the specification that incorrectly used the name "Purpose**For**Use" and that this may cause interoperability problems. Both the IHE XUA profile and the latest eHealth Exchange specification note that this attribute comes from the XSPA 1.0 specification, however, both the profile and the specification adjust the XSPA spec suggesting to use a simple string code. Instead both IHE and eHealth	Purpose**For**Use **REQUIRED** In the SHIN-NY requirements document PurposeForUse is described in section 3.10.1.1 SAML Assertion Structure and references eHealth Exchange as the standard (which may have been correct at the time). <saml2:Attribute Name="PurposeForUse" NameFormat="http://www.hhs.gov/healthit/nhin"> <saml2:AttributeValue> <nhin:**PurposeForUse** xmlns:nhin="http://www.hhs.gov/healthit/nhin" code="TREATMENT" codeSystem="2.16.840.1.113883.18.7.1" codeSystemName="nhin-purpose" displayName="treatment"/>	PurposeOfUse **REQUIRED** In eHealth Exchange specification see section 3.2.2.4.6 Purpose of Use for all possible codes and display names. <saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:purposeofuse"> <saml:AttributeValue> <PurposeOfUse xmlns="urn:hl7-org:v3" xsi:type="CE" code="OPERATIONS" codeSystem="2.16.840.1.113883.3.18.7.1" codeSystemName="nhin-purpose" displayName="Healthcare Operations"/> </saml:AttributeValue> </saml:Attribute> eHealth Exchange uses its own table of values which appears to be an extension of XSPA's table of purposeofuse possible values.	PurposeOfUse **REQUIRED** In IHE's latest published specification the XUA PurposeOfUse example is in ITI Volume 2 in section 3.40.4.1.2.3 PurposeOfUse Option. <saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:purposeofuse"> <saml:AttributeValue> <PurposeOfUse xmlns="urn:hl7-org:v3" xsi:type="CE" code="12" codeSystem="1.0.14265.1" codeSystemName="ISO 14265 Classification of Purposes for processing personal health information" displayName="Law Enforcement"/> </saml:AttributeValue> </saml:Attribute> IHE uses ISO 14265 - Health Informatics - Classification of purposes for processing personal health information

Exchange declare that the attribute value is an Hl7v3 Coded Element (CE). While both IHE and eHealth Exchange agree on using an XML HL7v3 CE element named PurposeOfUse the codeSystem described by eHealth Exchange and IHE are **not the same.** IHE PurposeOfUse codeSystem: 1.0.14265.1 eHealth Exchange PurposeOfUse codeSystem: 2.16.840.1.113883.3.18.7.1	</saml2:AttributeValue> </saml2:Attribute>	**WARNING: The latest published eHealth Exchange specification shows examples using "PurposeOfUse" and "PurposeofUse" but the normative text describes that the element name should be "PurposeOfUse" (with a capital O).**	ISO 14265 seems to be placed behind a paywall on the web.
Role of user This SAML attribute describes the role of the user (physician or other type of user). Both the IHE XUA profile and the latest eHealth Exchange specification note that this attribute comes from the XSPA 1.0 specification, however, both the profile and the specification adjust the XSPA spec suggesting to use a simple string code. Instead both IHE and eHealth	UserCategory **REQUIRED** <saml2:Attribute Name="UserCategory" NameFormat=" SHIN-NY Name Format "> <saml2:AttributeValue> <shinny:UserCategory xmlns:shinny="SHIN-NY Namespace" code="a" codeSystem="SHIN-NY CodeSystem" codeSystemName=”SHIN-NY CodeSystem Name" displayName="Physician"/> </saml2:AttributeValue> </saml2:Attribute> The SHIN-NY code	Role **REQUIRED** <saml:Attribute Name="urn:oasis:names:tc:xacml:2.0:subject:role"> <saml:AttributeValue> <Role xmlns="urn:hl7-org:v3" xsi:type="CE" code="46255001" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED_CT" displayName="Pharmacist"/> </saml:AttributeValue> </saml:Attribute> eHealth Exchange outlines this in section 3.2.2.4.5 Subject Role.	Role **REQUIRED** <saml:Attribute Name="urn:oasis:names:tc:xacml:2.0:subject:role"> <saml:AttributeValue> <Role xmlns="urn:hl7-org:v3" xsi:type="CE" code="46255001" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED_CT" displayName="Pharmacist"/> </saml:AttributeValue> </saml:Attribute> IHE shows this example in ITI Volume 2 in section 3.40.4.1.2.1 Subject-Role Option. The example code system happens to match that of eHealth

Exchange declare that the attribute value is an Hl7v3 Coded Element (CE). The eHealth Exchange specification describes SNOMED_CT specifically, yet IHE allows for the usage of other code systems. SHIN-NY uses a self-described codeSystem.	system is described in the document referenced in section 3.10.2 User Category Attribute. The document does not provide a codeSystem OID but rather "SHIN-NY CodeSystem". The codes are letters "a" through "f" with each letter describing a broad category of usage.		Exchange's required code system, but IHE only makes a loose recommendation.
RHIO	UserRHIO **REQUIRED** <saml2:Attribute Name="UserRHIO" NameFormat="SHIN-NY Name Format"> <saml2:AttributeValue xmlns:xsi=”http://www.w3.org/2001/XMLSchema-instance” xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string">Big RHIO</saml2:AttributeValue> </saml2:Attribute>	Organization **REQUIRED** <saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:organization"> <saml:AttributeValue>Family Medical Clinic</saml:AttributeValue> </saml:Attribute>	Same as eHealth Exchange
Organization	UserOrganization **REQUIRED** <saml2:Attribute Name="UserOrganization" NameFormat="http://www.hhs.gov/healthit/nhin"> <saml2:AttributeValue xmlns:xsi=”http://www.w3.org/2001/XMLSchema-instance” xmlns:xs="http://www.w3.org/2001/XMLSchema"	Organization ID **REQUIRED** <saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:organization-id"> <saml:AttributeValue>http://familymedicalclinic.org</saml:AttributeValue> </saml:Attribute>	Same as eHealth Exchange

	xsi:type="xs:string">John Doe Clinic</saml2:AttributeValue> </saml2:Attribute>		
User Name	UserName **REQUIRED** <saml2:Attribute Name="UserName" NameFormat="http://www.hhs.gov/healthit/nhin"> <saml2:AttributeValue xmlns:xsi=”http://www.w3.org/2001/XMLSchema-instance” xmlns:xs="http://www.w3.org/2001/XMLSchema" xsi:type="xs:string">Dr. John Doe</saml2:AttributeValue> </saml2:Attribute>	Subject ID **REQUIRED** <saml:Attribute Name="urn:oasis:names:tc:xspa:1.0:subject:subject-id"> <saml:AttributeValue>Jane Doe</saml:AttributeValue> </saml:Attribute>	Same as eHealth Exchange
Home Community ID	N/A Initiating QE's home community ID is not a SHIN-NY 1.5 attribute.	homeCommunityId **REQUIRED** <saml:Attribute Name="urn:nhin:names:saml:homeCommunityId"> <saml:AttributeValue>urn:oid:2.16.840.1.113883.3.190</saml:AttributeValue> </saml:Attribute> **Note: the attribute name is DIFFERENT from IHE's attribute name.**	homeCommunityId **REQUIRED** <saml:Attribute Name="urn:ihe:iti:xca:2010:homeCommunityId"> <saml:AttributeValue>urn:oid:2.16.840.1.113883.3.190</saml:AttributeValue> </saml:Attribute>
Resource ID (Patient ID)	N/A	Resource ID **OPTIONAL** <saml:Attribute Name="urn:oasis:names:tc:xacml:2.0:resource:resource-id"> <saml:AttributeValue>543797436^^^&1.2.840.113619.6.197&ISO</saml:AttributeValue>	Same as eHealth Exchange

		</saml:Attribute>	
National Provider ID (NPI)	N/A	NPI **OPTIONAL** <saml:Attribute Name="urn:oasis:names:tc:xspa:2.0:subject:npi"> <saml:AttributeValue>1234567890</saml:AttributeValue> </saml:Attribute>	Same as eHealth Exchange

Role

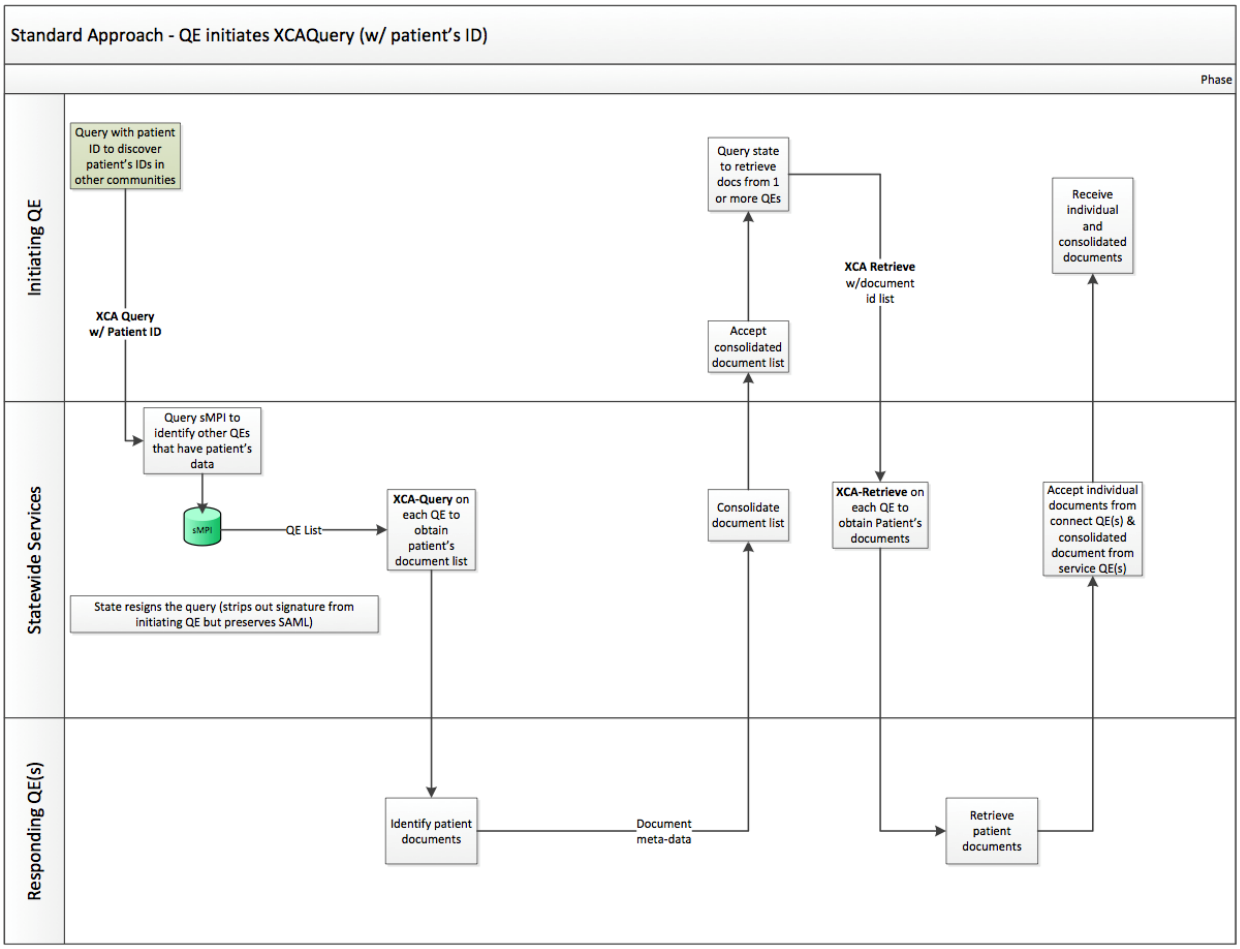
The

Security Differences

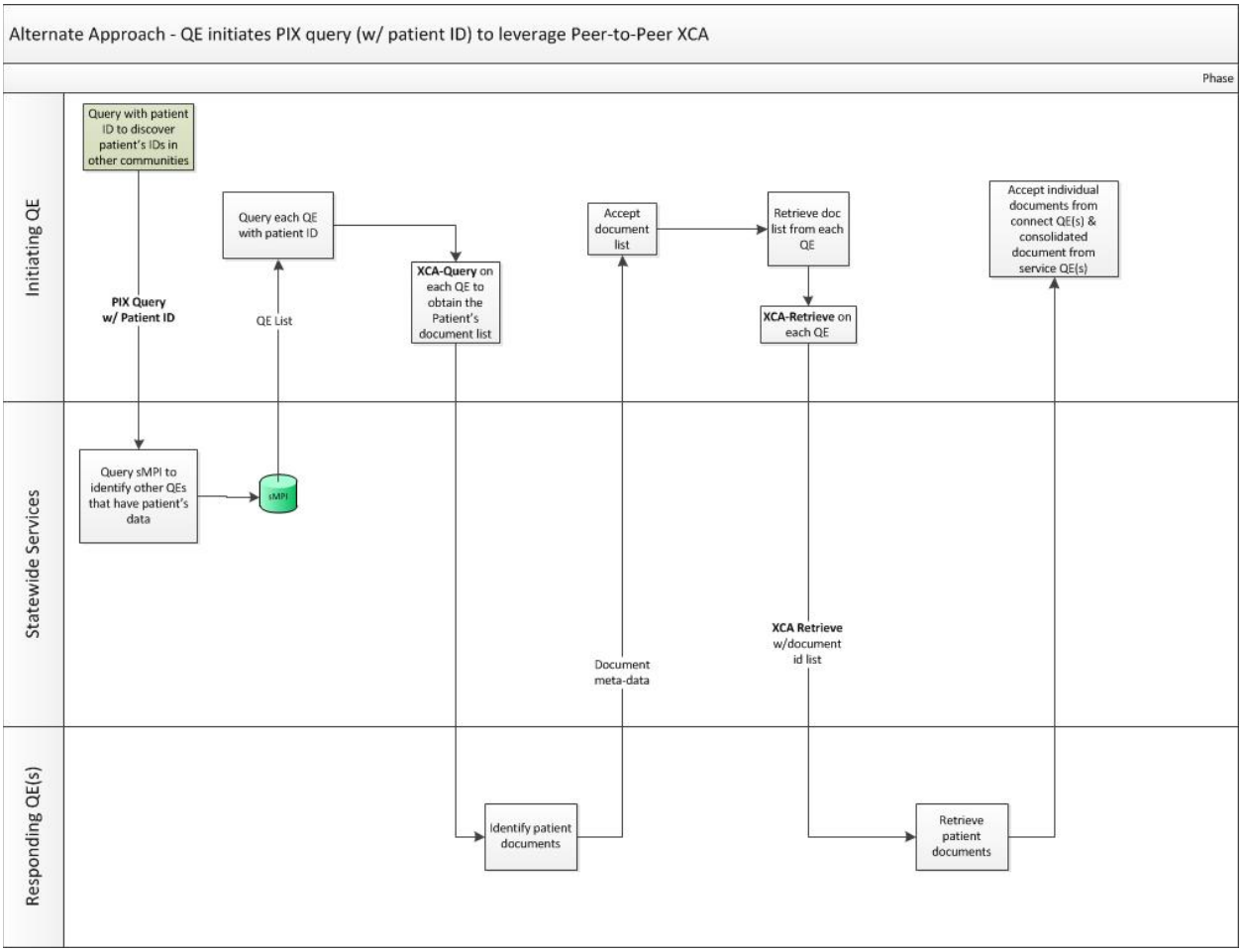
	SHIN-NY 2009	eHealth Exchange 2010	IHE 2013
SAML Subject confirmation method	Sender Vouches	Holder of key	Bearer SHALL be supported Holder of key MAY be supported
Signed Elements	Security header timestamp Message body Note that message body signing in the presence of MTOM encoding is implemented poorly in some web services implementations.	Security header timestamp	Not specified in IHE

Appendix C: Patient Record Lookup Process Flow

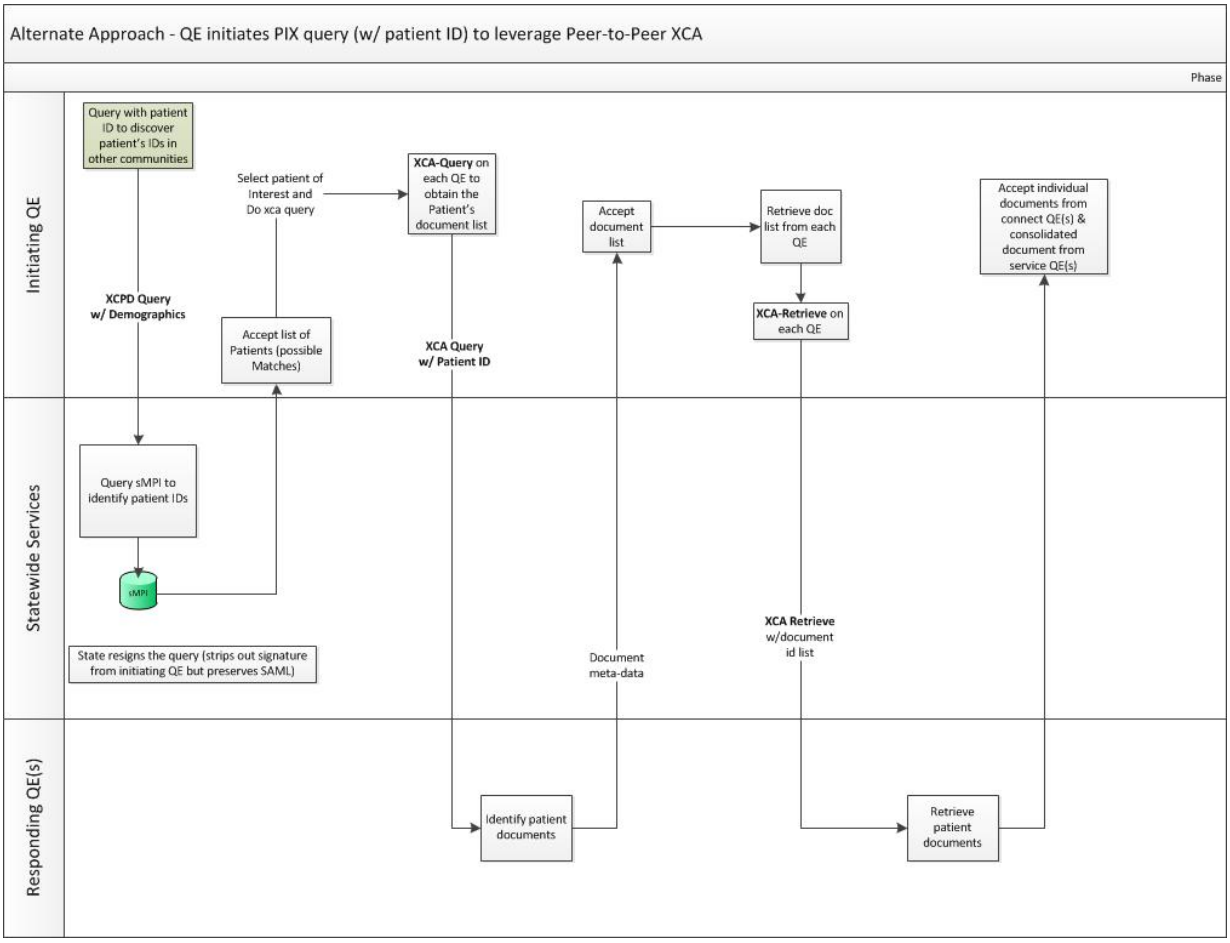
1. sXCA



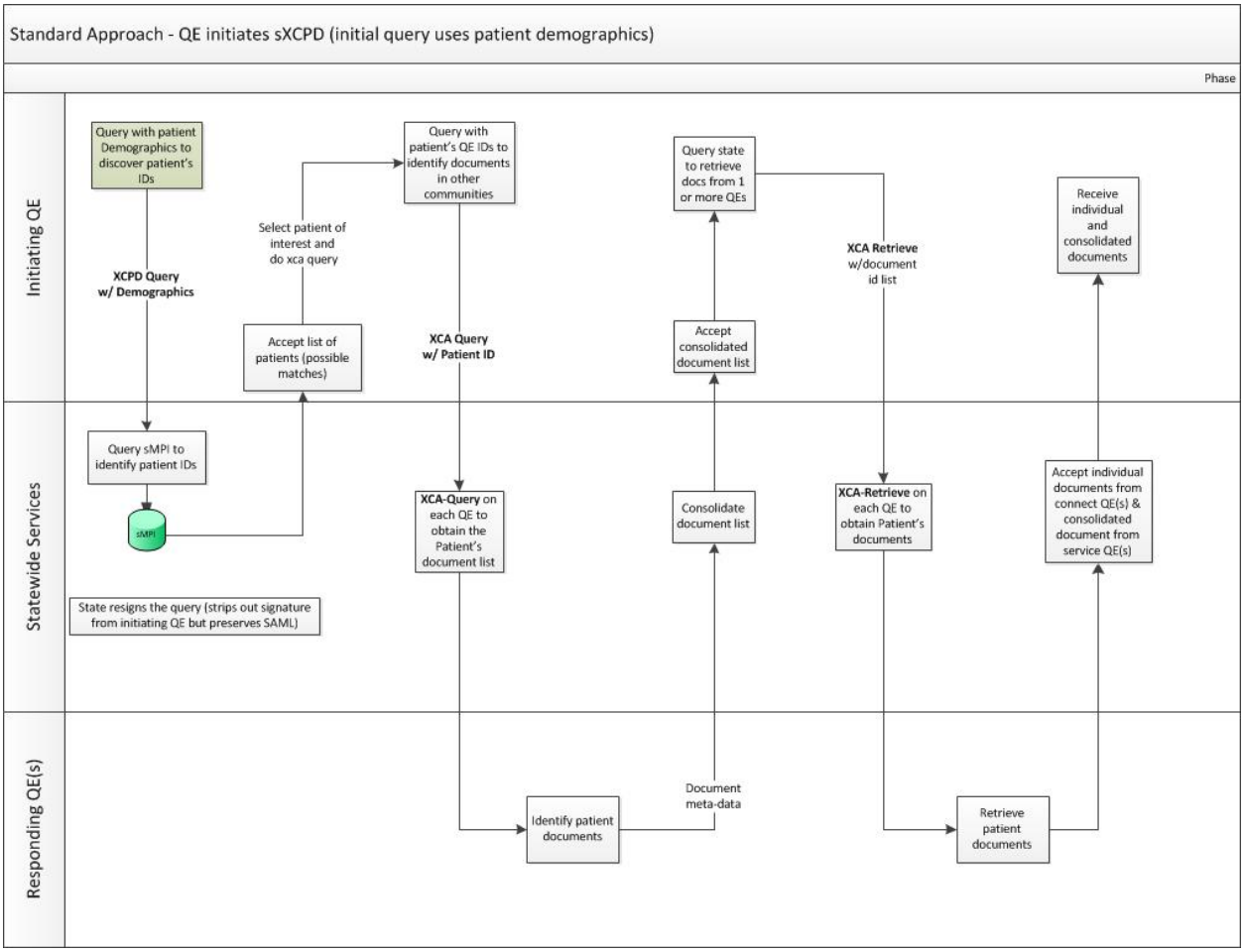
2. PIX + Peer-to-Peer XCA



3. sXCPD + Peer-to-Peer XCA


Alternate Approach - QE initiates PIX query (w/ patient ID) to leverage Peer-to-Peer XCA
Phase
Initiating QE
Statewide Services
Responding QE(s)
Query with patient ID to discover patient's IDs in other communities
XCPD Query w/ Demographics
Query sMPI to identify patient IDs
sMPI
State resigns the query (strips out signature from initiating QE but preserves SAML)
Accept list of Patients (possible Matches)
Select patient of Interest and Do xca query
XCA-Query on each QE to obtain the Patient's document list
XCA Query w/ Patient ID
Identify patient documents
Document meta-data
Accept document list
Retrieve doc list from each QE
XCA-Retrieve on each QE
XCA Retrieve w/document id list
Retrieve patient documents
Accept individual documents from connect QE(s) & consolidated document from service QE(s)

4. sXCPD + sXCA


Standard Approach - QE initiates sXCPD (initial query uses patient demographics)
Phase
Initiating QE
Statewide Services
Responding QE(s)
Query with patient Demographics to discover patient's IDs
XCPD Query w/ Demographics
Select patient of interest and do xca query
Query with patient's QE IDs to identify documents in other communities
XCA Query w/ Patient ID
Query state to retrieve docs from 1 or more QEs
XCA Retrieve w/document id list
Receive individual and consolidated documents
Accept list of patients (possible matches)
Accept consolidated document list
Query sMPI to identify patient IDs
sMPI
State resigns the query (strips out signature from initiating QE but preserves SAML)
XCA-Query on each QE to obtain the Patient's document list
Consolidate document list
XCA-Retrieve on each QE to obtain Patient's documents
Accept individual documents from connect QE(s) & consolidated document from service QE(s)
Identify patient documents
Document meta-data
Retrieve patient documents

Appendix D: Sample Messages

XCPD Response from sXCPD: patients from different QEs

```
<soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:wsse="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
  <soapenv:Header>
    <wsa:To>http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:MessageID>urn:uuid:c2037d2d-eed1-42a9-b60e-863ebf2b82cb</wsa:MessageID>
    <wsa:Action soapenv:mustUnderstand="true">urn:hl7-
org:v3:PRPA_IN201306UV02:CrossGatewayPatientDiscovery</wsa:Action>
    <wsa:RelatesTo>urn:uuid:216a1350-b896-4406-8f35-27ec65da6696</wsa:RelatesTo>
    <wsse:Security xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" soap:mustUnderstand="true">
      <wsu:Timestamp wsu:Id="TS-33">
        <wsu:Created>2014-08-22T18:10:45.976Z</wsu:Created>
        <wsu:Expires>2014-08-22T18:15:45.976Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse11:SignatureConfirmation xmlns:wsse11="http://docs.oasis-open.org/wss/oasis-wss-wssecurity-
secext-1.1.xsd"
Value="ZRf5imjfeiVwmKCk4/Mp+lDBAXu26Ln2gbGkhFMRb7XR5hpku6vP1nAb30WYFBdmKNS4DLFxg3fr
8RMzOab0KH59rJYmeYFCdtIta81NDK32Mu1547kbFqXOjySq7n5TeloEdUjDuC2pl5pG4+Yw2Etc
fnirjjHwtUmQ8AASMkG0pVnbxTxUOGVD8anWUqaK6j5HyASwk/QhZ+6aLK1Pk1ffI8NOF30CxOxh
zN1nXc0t48iKLRCKX68yuLaqUvXO/HEo5YSvHkyad06f0zC6mALpbfnvzaMkuHs260MpVm2Fjv91
U607lwfsSqgT8Q/yeWJJjT4ZA8A4LHC67pXeSw==" wsu:Id="SC-42" />
    </wsse:Security>
  </soapenv:Header>
  <soapenv:Body>
    <PRPA_IN201306UV02 xmlns="urn:hl7-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
ITSVersion="XML_1.0">
      <id root="1.2.840.114350.1.13.999.238" extension="d4005ad3-ca00-45da-b010-55f308dda8c4" />
      <creationTime value="20140312075902" />
      <interactionId root="2.16.840.1.113883.1.6" extension="PRPA_IN201306UV02" />
      <processingCode code="P" />
      <processingModeCode code="I" />
      <acceptAckCode code="NE" />
      <receiver typeCode="RCV">
        <device classCode="DEV" determinerCode="INSTANCE">
          <id root="2.16.840.1.113883.3.2591.600.1.0.2.1" />
        </device>
      </receiver>
      <sender typeCode="SND">
        <device classCode="DEV" determinerCode="INSTANCE">
          <id root="1.1.1.2" />
          <telecom value="https://ec2-54-209-223-170.compute-1.amazonaws.com:8443/pdqxsupplier" />
```

```
        </device>
      </sender>
      <acknowledgement>
        <typeCode code="AA" />
        <targetMessage>
          <urn:id xmlns:urn="urn:hl7-org:v3" extension="0531bb83-cf7e-41b3-9545-ddb3cb306e69"
root="2.16.840.1.113883.3.2591.600.1.0.6" />
        </targetMessage>
      </acknowledgement>
      <controlActProcess classCode="CACT" moodCode="EVN">
        <code code="PRPA_TE201306UV02" codeSystem="2.16.840.1.113883.1.6" />
        <subject typeCode="SUBJ">
          <registrationEvent classCode="REG" moodCode="EVN">
            <id nullFlavor="NA" />
            <statusCode code="active" />
            <subject1 typeCode="SBJ">
              <patient classCode="PAT">
                <id root="2.16.840.1.113883.3.2591.600.1.2.1.1" extension="65159157"
assigningAuthorityName="Community 2 AA" />
                <statusCode code="active" />
                <patientPerson classCode="PSN" determinerCode="INSTANCE">
                  <name>
                    <given>Colette</given>
                    <family>Cavanaugh</family>
                  </name>
                  <administrativeGenderCode code="F" />
                  <birthTime value="19840229" />
                  <addr>
                    <streetAddressLine>32 Seventh St.</streetAddressLine>
                    <city>Shelbyville</city>
                    <state>KY</state>
                    <postalCode>40065</postalCode>
                  </addr>
                </patientPerson>
                <providerOrganization classCode="ORG" determinerCode="INSTANCE">
                  <id root="1.2.840.114350.1.13.99998.8734" />
                  <name>ITT Health Clinic</name>
                  <contactParty classCode="CON">
                    <telecom value="tel:+1-342-555-8394" />
                  </contactParty>
                </providerOrganization>
                <subjectOf1>
                  <queryMatchObservation classCode="OBS" moodCode="EVN">
                    <code code="IHE_PDQ" />
                    <value xsi:type="INT" value="100" />
                  </queryMatchObservation>
```

```
            </subjectOf1>
          </patient>
        </subject1>
        <custodian typeCode="CST">
          <assignedEntity classCode="ASSIGNED">
            <!-- Intermidiate HCID -->
            <id root="2.16.840.1.113883.3.2591.600.3.2.1" />
            <code code="NotHealthDataLocator" codeSystem="1.3.6.1.4.1.19376.1.2.27.2" />
            <representedOrganization classCode="ORG" determinerCode="INSTANCE">
              <!-- source community HCID, Name, Contact -->
              <id root="2.16.840.1.113883.3.2591.600.1.2.1" />
              <name>Community 2</name>
              <contactParty classCode="CON">
                <telecom value="tel:+1-123-456-7890" />
              </contactParty>
            </representedOrganization>
          </assignedEntity>
        </custodian>
      </registrationEvent>
    </subject>
    <subject typeCode="SUBJ">
      <registrationEvent classCode="REG" moodCode="EVN">
        <id nullFlavor="NA" />
        <statusCode code="active" />
        <subject1 typeCode="SBJ">
          <patient classCode="PAT">
            <id root="2.16.840.1.113883.3.2591.600.1.1.1.1" extension="113N04E"
assigningAuthorityName="Community 1 AA" />
            <statusCode code="active" />
            <patientPerson classCode="PSN" determinerCode="INSTANCE">
              <name>
                <given>Colette</given>
                <family>Cavanaugh</family>
              </name>
              <administrativeGenderCode code="F" />
              <birthTime value="19840229" />
              <addr>
                <streetAddressLine>32 Seventh St.</streetAddressLine>
                <city>Shelbyville</city>
                <state>KY</state>
                <postalCode>40065</postalCode>
              </addr>
            </patientPerson>
            <providerOrganization classCode="ORG" determinerCode="INSTANCE">
              <id root="1.2.840.114350.1.13.99998.8734" />
              <name>ITT Health Clinic</name>
```

```
                <contactParty classCode="CON">
                  <telecom value="tel:+1-342-555-8394" />
                </contactParty>
              </providerOrganization>
              <subjectOf1>
                <queryMatchObservation classCode="OBS" moodCode="EVN">
                  <code code="IHE_PDQ" />
                  <value xsi:type="INT" value="100" />
                </queryMatchObservation>
              </subjectOf1>
            </patient>
          </subject1>
          <custodian typeCode="CST">
            <assignedEntity classCode="ASSIGNED">
              <!—Intermediate gateway HCID -->
              <id root="2.16.840.1.113883.3.2591.600.3.2.1" />
              <code code="NotHealthDataLocator" codeSystem="1.3.6.1.4.1.19376.1.2.27.2" />
              <representedOrganization classCode="ORG" determinerCode="INSTANCE">
                <!-- source community HCID, Name, Contact -->
                <id root="2.16.840.1.113883.3.2591.600.1.1.1" />
                <name>Community 1</name>
                <contactParty classCode="CON">
                  <telecom value="tel:+1-123-456-7891" />
                </contactParty>
              </representedOrganization>
            </assignedEntity>
          </custodian>
        </registrationEvent>
      </subject>
      <queryAck>
        <urn:queryId xmlns:urn="urn:hl7-org:v3" extension="0531bb83-cf7e-41b3-9545-ddb3cb306e69"
root="2.16.840.1.113883.3.2591.600.1.0.6" />
        <queryResponseCode code="OK" />
        <resultTotalQuantity value="2" />
        <resultCurrentQuantity value="2" />
        <resultRemainingQuantity value="0" />
      </queryAck>
      <urn:queryByParameter xmlns:urn="urn:hl7-org:v3">
        <urn:queryId extension="0531bb83-cf7e-41b3-9545-ddb3cb306e69"
root="2.16.840.1.113883.3.2591.600.1.0.6" />
        <urn:statusCode code="new" />
        <urn:initialQuantity value="10" />
        <urn:parameterList>
          <urn:livingSubjectAdministrativeGender>
            <urn:value code="F" />
            <urn:semanticsText>LivingSubject.administrativeGender</urn:semanticsText>
```

```
            </urn:livingSubjectAdministrativeGender>
            <urn:livingSubjectBirthTime>
              <urn:value value="19840229" />
              <urn:semanticsText>LivingSubject.birthTime</urn:semanticsText>
            </urn:livingSubjectBirthTime>
            <urn:livingSubjectId>
              <urn:value extension="36356756705" root="2.16.840.1.113883.3.2591.600.1.0.1.1" />
              <urn:semanticsText>LivingSubject.id</urn:semanticsText>
            </urn:livingSubjectId>
            <urn:livingSubjectName>
              <urn:value>
                <urn:given>Colette</urn:given>
                <urn:family>Cavanaugh</urn:family>
              </urn:value>
              <urn:semanticsText>LivingSubject.name</urn:semanticsText>
            </urn:livingSubjectName>
          </urn:parameterList>
        </urn:queryByParameter>
      </controlActProcess>
    </PRPA_IN201306UV02>
  </soapenv:Body>
</soapenv:Envelope>
```

XCPD Response from sXCPD: partial success

```
<?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" xmlns:wsse="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
  <soapenv:Header>
    <wsa:To>http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:MessageID>urn:uuid:c2037d2d-eed1-42a9-b60e-863ebf2b82cb</wsa:MessageID>
    <wsa:Action soapenv:mustUnderstand="true">urn:hl7-
org:v3:PRPA_IN201306UV02:CrossGatewayPatientDiscovery</wsa:Action>
    <wsa:RelatesTo>urn:uuid:216a1350-b896-4406-8f35-27ec65da6696</wsa:RelatesTo>
    <wsse:Security xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" soap:mustUnderstand="true">
      <wsu:Timestamp wsu:Id="TS-33">
        <wsu:Created>2014-08-22T18:10:45.976Z</wsu:Created>
        <wsu:Expires>2014-08-22T18:15:45.976Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse11:SignatureConfirmation xmlns:wsse11="http://docs.oasis-open.org/wss/oasis-wss-wssecurity-
secext-1.1.xsd"
Value="ZRf5imjfeiVwmKCk4/Mp+lDBAXu26Ln2gbGkhFMRb7XR5hpku6vP1nAb30WYFBdmKNS4DLFxg3fr
8RMzOab0KH59rJYmeYFCdtIta81NDK32Mu1547kbFqXOjySq7n5TeloEdUjDuC2pl5pG4+Yw2Etc
fnirjjHwtUmQ8AASMkG0pVnbxTxUOGVD8anWUqaK6j5HyASwk/QhZ+6aLK1Pk1ffI8NOF30CxOxh
```

```
zN1nXc0t48iKLRCKX68yuLaqUvXO/HEo5YSvHkyad06f0zC6mALpbfnvzaMkuHs260MpVm2Fjv91
U607lwfsSqgT8Q/yeWJJjT4ZA8A4LHC67pXeSw==" wsu:Id="SC-42" />
    </wsse:Security>
  </soapenv:Header>
  <soapenv:Body>
    <PRPA_IN201306UV02 xmlns="urn:hl7-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
ITSVersion="XML_1.0">
      <id root="1.2.840.114350.1.13.999.238" extension="d4005ad3-ca00-45da-b010-55f308dda8c4" />
      <creationTime value="20140312075902" />
      <interactionId root="2.16.840.1.113883.1.6" extension="PRPA_IN201306UV02" />
      <processingCode code="P" />
      <processingModeCode code="I" />
      <acceptAckCode code="NE" />
      <receiver typeCode="RCV">
        <device classCode="DEV" determinerCode="INSTANCE">
          <id root="2.16.840.1.113883.3.2591.600.1.0.2.1" />
        </device>
      </receiver>
      <sender typeCode="SND">
        <device classCode="DEV" determinerCode="INSTANCE">
          <id root="1.1.1.2" />
          <telecom value="https://ec2-54-209-223-170.compute-1.amazonaws.com:8443/pdqxsupplier" />
        </device>
      </sender>
      <acknowledgement>
        <typeCode code="AE" />
        <targetMessage>
          <urn:id xmlns:urn="urn:hl7-org:v3" extension="0531bb83-cf7e-41b3-9545-ddb3cb306e69"
root="2.16.840.1.113883.3.2591.600.1.0.6" />
        </targetMessage>
        <acknowledgementDetail typeCode="E">
          <text>Error occurred querying for patient from Community 2: no response within timeout
period.</text>
        </acknowledgementDetail>
      </acknowledgement>
      <controlActProcess classCode="CACT" moodCode="EVN">
        <code code="PRPA_TE201306UV02" codeSystem="2.16.840.1.113883.1.6" />
        <subject typeCode="SUBJ">
          <registrationEvent classCode="REG" moodCode="EVN">
            <id nullFlavor="NA" />
            <statusCode code="active" />
            <subject1 typeCode="SBJ">
              <patient classCode="PAT">
                <id root="2.16.840.1.113883.3.2591.600.1.1.1.1" extension="113N04E"
assigningAuthorityName="Community 1 AA" />
                <statusCode code="active" />
```

```
            <patientPerson classCode="PSN" determinerCode="INSTANCE">
              <name>
                <given>Colette</given>
                <family>Cavanaugh</family>
              </name>
              <administrativeGenderCode code="F" />
              <birthTime value="19840229" />
              <addr>
                <streetAddressLine>32 Seventh St.</streetAddressLine>
                <city>Shelbyville</city>
                <state>KY</state>
                <postalCode>40065</postalCode>
              </addr>
            </patientPerson>
            <providerOrganization classCode="ORG" determinerCode="INSTANCE">
              <id root="1.2.840.114350.1.13.99998.8734" />
              <name>ITT Health Clinic</name>
              <contactParty classCode="CON">
                <telecom value="tel:+1-342-555-8394" />
              </contactParty>
            </providerOrganization>
            <subjectOf1>
              <queryMatchObservation classCode="OBS" moodCode="EVN">
                <code code="IHE_PDQ" />
                <value xsi:type="INT" value="100" />
              </queryMatchObservation>
            </subjectOf1>
          </patient>
        </subject1>
        <custodian typeCode="CST">
          <assignedEntity classCode="ASSIGNED">
            <!-- Intermidiate HCID -->
            <id root="2.16.840.1.113883.3.2591.600.3.2.1" />
            <code code="NotHealthDataLocator" codeSystem="1.3.6.1.4.1.19376.1.2.27.2" />
            <representedOrganization classCode="ORG" determinerCode="INSTANCE">
              <!-- source community HCID, Name, Contact -->
              <id root="2.16.840.1.113883.3.2591.600.1.1.1" />
              <name>Community 1</name>
              <contactParty classCode="CON">
                <telecom value="tel:+1-123-456-7891" />
              </contactParty>
            </representedOrganization>
          </assignedEntity>
        </custodian>
      </registrationEvent>
    </subject>
```

```
        <queryAck>
          <urn:queryId xmlns:urn="urn:hl7-org:v3" extension="0531bb83-cf7e-41b3-9545-ddb3cb306e69"
root="2.16.840.1.113883.3.2591.600.1.0.6" />
          <queryResponseCode code="AE" />
          <resultTotalQuantity value="1" />
          <resultCurrentQuantity value="1" />
          <resultRemainingQuantity value="0" />
        </queryAck>
        <urn:queryByParameter xmlns:urn="urn:hl7-org:v3">
          <urn:queryId extension="0531bb83-cf7e-41b3-9545-ddb3cb306e69"
root="2.16.840.1.113883.3.2591.600.1.0.6" />
          <urn:statusCode code="new" />
          <urn:initialQuantity value="10" />
          <urn:parameterList>
            <urn:livingSubjectAdministrativeGender>
              <urn:value code="F" />
              <urn:semanticsText>LivingSubject.administrativeGender</urn:semanticsText>
            </urn:livingSubjectAdministrativeGender>
            <urn:livingSubjectBirthTime>
              <urn:value value="19840229" />
              <urn:semanticsText>LivingSubject.birthTime</urn:semanticsText>
            </urn:livingSubjectBirthTime>
            <urn:livingSubjectId>
              <urn:value extension="36356756705" root="2.16.840.1.113883.3.2591.600.1.0.1.1" />
              <urn:semanticsText>LivingSubject.id</urn:semanticsText>
            </urn:livingSubjectId>
            <urn:livingSubjectName>
              <urn:value>
                <urn:given>Colette</urn:given>
                <urn:family>Cavanaugh</urn:family>
              </urn:value>
              <urn:semanticsText>LivingSubject.name</urn:semanticsText>
            </urn:livingSubjectName>
          </urn:parameterList>
        </urn:queryByParameter>
      </controlActProcess>
    </PRPA_IN201306UV02>
  </soapenv:Body>
</soapenv:Envelope>
```

XCA Query Response from sXCA: 2 documents from different QEs

Below is a sample XCA response from the sXCA services, with 2 documents from 2 different communities returned.

```
<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://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:MessageID>urn:uuid:670fe53a-d621-4e69-b255-b274d6d7c154</wsa:MessageID>
    <wsa:Action soapenv:mustUnderstand="true">urn:ihe:iti:2007:CrossGatewayQueryResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:2a4c5080-cd4f-4ba7-af5d-a4251855078a</wsa:RelatesTo>
    <wsse:Security xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-
1.0.xsd" xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" soap:mustUnderstand="true">
      <wsu:Timestamp wsu:Id="TS-33">
        <wsu:Created>2014-08-22T18:10:45.976Z</wsu:Created>
        <wsu:Expires>2014-08-22T18:15:45.976Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse11:SignatureConfirmation xmlns:wsse11="http://docs.oasis-open.org/wss/oasis-wss-wssecurity-
secext-1.1.xsd"
Value="ZRf5imjfeiVwmKCk4/Mp+lDBAXu26Ln2gbGkhFMRb7XR5hpku6vP1nAb30WYFBdmKNS4DLFxg3fr
8RMzOab0KH59rJYmeYFCdtIta81NDK32Mu1547kbFqXOjySq7n5TeloEdUjDuC2pl5pG4+Yw2Etc
fnirjjHwtUmQ8AASMkG0pVnbxTxUOGVD8anWUqaK6j5HyASwk/QhZ+6aLK1Pk1ffI8NOF30CxOxh
zN1nXc0t48iKLRCKX68yuLaqUvXO/HEo5YSvHkyad06f0zC6mALpbfnvzaMkuHs260MpVm2Fjv91
U607lwfsSqgT8Q/yeWJJjT4ZA8A4LHC67pXeSw==" wsu:Id="SC-42" />
    </wsse:Security>
  </soapenv:Header>
  <soapenv:Body>
    <query:AdhocQueryResponse xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" status="urn:oasis:names:tc:ebxml-
regrep:ResponseStatusType:Success">
      <rim:RegistryObjectList>
        <rim:ExtrinsicObject home="urn:oid:2.16.840.1.113883.3.2591.600.3.1.1" id="urn:uuid:b1ed415a-633b-
11e3-bf13-d231feb1dc81" mimeType="text/plain" objectType="urn:uuid:7edca82f-054d-47f2-a032-
9b2a5b5186c1" status="urn:oasis:names:tc:ebxml-regrep:StatusType:Approved">
          <rim:Slot name="hash">
            <rim:ValueList>
              <rim:Value>fb0abe81f01d1601a325009ba2c7538462e35070</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="size">
            <rim:ValueList>
              <rim:Value>34</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="repositoryUniqueId">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.3.2591.600.1.1.4.2</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="languageCode">
            <rim:ValueList>
```

```
            <rim:Value>en-us</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="sourcePatientId">
          <rim:ValueList>
            <rim:Value>000135^^^&amp;amp;2.16.840.1.113883.3.2591.600.1.1.1.2&amp;amp;ISO</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="serviceStartTime">
          <rim:ValueList>
            <rim:Value>20120414070000</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="serviceStopTime">
          <rim:ValueList>
            <rim:Value>20120415070000</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="creationTime">
          <rim:ValueList>
            <rim:Value>20120501110000</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Classification classificationScheme="urn:uuid:93606bcf-9494-43ec-9b4e-a7748d1a838d"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c153" nodeRepresentation="">
          <rim:Slot name="authorPerson">
            <rim:ValueList>
              <rim:Value>^Welby^QEA^^MD^Dr</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorInstitution">
            <rim:ValueList>
              <rim:Value>QE A^^^^^^^^^2.16.840.1.113883.3.2591.600.1.1.1</rim:Value>
            </rim:ValueList>
            <rim:ValueList>
              <rim:Value>Hospital A^^^^^^^^^1.2.3.5.8.9.1789.45</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorRole">
            <rim:ValueList>
              <rim:Value>role A</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorSpecialty">
            <rim:ValueList>
```

```
              <rim:Value>specialty A</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorTelecommunication">
            <rim:ValueList>
              <rim:Value>^^Internet^drA@qeA.org</rim:Value>
            </rim:ValueList>
          </rim:Slot>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:41a5887f-8865-4c09-adf7-e362475b143a"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c154" nodeRepresentation="34133-9">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.6.1</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Summarization of Episode Note" />
          </rim:Name>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:f4f85eac-e6cb-4883-b524-f2705394840f"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c154" nodeRepresentation="N">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.5.25</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Normal" />
          </rim:Name>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:a09d5840-386c-46f2-b5ad-9c3699a4309d"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c154" nodeRepresentation="urn:ihe:pcc:edr:2007">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.3.88.12.80.73</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Emergency Department Referral (EDR)" />
          </rim:Name>
        </rim:Classification>
```

```
        <rim:Classification classificationScheme="urn:uuid:f33fb8ac-18af-42cc-ae0e-ed0b0bdb91e1"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c154" nodeRepresentation="36125001">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.6.96</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Hospital-trauma center" />
          </rim:Name>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:cccf5598-8b07-4b77-a05e-ae952c785ead"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c154" nodeRepresentation="394802001">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.6.96</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="General Medicine" />
          </rim:Name>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:f0306f51-975f-434e-a61c-c59651d33983"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c154" nodeRepresentation="34109-9">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.6.1</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Evaluation and management note" />
          </rim:Name>
        </rim:Classification>
        <rim:ExternalIdentifier id="urn:uuid:670fe53a-d621-4e69-b255-b274d6d7c154"
identificationScheme="urn:uuid:2e82c1f6-a085-4c72-9da3-8640a32e42ab" registryObject="urn:uuid:b1ed415a-
633b-11e3-bf13-d231feb1dc81" value="11591611565A">
          <rim:Name>
            <rim:LocalizedString value="XDSDocumentEntry.uniqueId" />
          </rim:Name>
        </rim:ExternalIdentifier>
        <rim:ExternalIdentifier id="urn:uuid:670fe53a-d621-4e69-b255-b274d6d7c154"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427" registryObject="urn:uuid:b1ed415a-
633b-11e3-bf13-d231feb1dc81" value="117431A^^^&amp;amp;2.16.840.1.113883.3.2591.600.1.1.1.1&amp;amp;ISO">
```

```
            <rim:Name>
              <rim:LocalizedString value="XDSDocumentEntry.patientId" />
            </rim:Name>
          </rim:ExternalIdentifier>
        </rim:ExtrinsicObject>
        <rim:ExtrinsicObject home="urn:oid:2.16.840.1.113883.3.2591.600.3.1.1" id="urn:uuid:b1ed415a-633b-
11e3-bf13-d231feb1dc82" mimeType="text/plain" objectType="urn:uuid:7edca82f-054d-47f2-a032-
9b2a5b5186c1" status="urn:oasis:names:tc:ebxml-regrep:StatusType:Approved">
          <rim:Slot name="hash">
            <rim:ValueList>
              <rim:Value>fb0abe81f01d1601a325009ba2c7538462e35070</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="size">
            <rim:ValueList>
              <rim:Value>34</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="repositoryUniqueId">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.3.2591.600.1.1.4.3</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="languageCode">
            <rim:ValueList>
              <rim:Value>en-us</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="sourcePatientId">
            <rim:ValueList>
              <rim:Value>100135B^^^&amp;amp;2.16.840.1.113883.3.2591.600.1.1.2.2&amp;amp;ISO</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="serviceStartTime">
            <rim:ValueList>
              <rim:Value>20120414070000</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="serviceStopTime">
            <rim:ValueList>
              <rim:Value>20120415070000</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="creationTime">
            <rim:ValueList>
              <rim:Value>20120501110000</rim:Value>
```

```
            </rim:ValueList>
          </rim:Slot>
          <rim:Classification classificationScheme="urn:uuid:93606bcf-9494-43ec-9b4e-a7748d1a838d"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc82" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c153" nodeRepresentation="">
            <rim:Slot name="authorPerson">
              <rim:ValueList>
                <rim:Value>^Welby^QEB^^MD^Dr</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="authorInstitution">
              <rim:ValueList>
                <rim:Value>QE B^^^^^^^^^2.16.840.1.113883.3.2591.600.1.1.2</rim:Value>
              </rim:ValueList>
              <rim:ValueList>
                <rim:Value>Some Hospital B^^^^^^^^^1.2.3.5.8.9.1789.46</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="authorRole">
              <rim:ValueList>
                <rim:Value>role B</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="authorSpecialty">
              <rim:ValueList>
                <rim:Value>Medical Doctor</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Slot name="authorTelecommunication">
              <rim:ValueList>
                <rim:Value>^^Internet^drB@qeb.org</rim:Value>
              </rim:ValueList>
            </rim:Slot>
          </rim:Classification>
          <rim:Classification classificationScheme="urn:uuid:41a5887f-8865-4c09-adf7-e362475b143a"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc82" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c154" nodeRepresentation="34133-9">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
                <rim:Value>2.16.840.1.113883.6.1</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="Summarization of Episode Note" />
            </rim:Name>
          </rim:Classification>
```

```
        <rim:Classification classificationScheme="urn:uuid:f4f85eac-e6cb-4883-b524-f2705394840f"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc82" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c155" nodeRepresentation="N">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.5.25</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Normal" />
          </rim:Name>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:a09d5840-386c-46f2-b5ad-9c3699a4309d"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc82" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c156" nodeRepresentation="urn:ihe:pcc:edr:2007">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.3.88.12.80.73</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Emergency Department Referral (EDR)" />
          </rim:Name>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:f33fb8ac-18af-42cc-ae0e-ed0b0bdb91e1"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc82" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c157" nodeRepresentation="36125001">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.6.96</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="Hospital-trauma center" />
          </rim:Name>
        </rim:Classification>
        <rim:Classification classificationScheme="urn:uuid:cccf5598-8b07-4b77-a05e-ae952c785ead"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc82" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c158" nodeRepresentation="394802001">
          <rim:Slot name="codingScheme">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.6.96</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Name>
            <rim:LocalizedString value="General Medicine" />
```

```
            </rim:Name>
          </rim:Classification>
          <rim:Classification classificationScheme="urn:uuid:f0306f51-975f-434e-a61c-c59651d33983"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc82" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c159" nodeRepresentation="34109-9">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
                <rim:Value>2.16.840.1.113883.6.1</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="Evaluation and management note" />
            </rim:Name>
          </rim:Classification>
          <rim:ExternalIdentifier id="urn:uuid:670fe53a-d621-4e69-b255-b274d6d7c154"
identificationScheme="urn:uuid:2e82c1f6-a085-4c72-9da3-8640a32e42ab" registryObject="urn:uuid:b1ed415a-
633b-11e3-bf13-d231feb1dc82" value="11591611565B">
            <rim:Name>
              <rim:LocalizedString value="XDSDocumentEntry.uniqueId" />
            </rim:Name>
          </rim:ExternalIdentifier>
          <rim:ExternalIdentifier id="urn:uuid:670fe53a-d621-4e69-b255-b274d6d7c154"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427" registryObject="urn:uuid:b1ed415a-
633b-11e3-bf13-d231feb1dc82" value="117431B^^^&amp;amp;2.16.840.1.113883.3.2591.600.1.1.2.1&amp;amp;ISO">
            <rim:Name>
              <rim:LocalizedString value="XDSDocumentEntry.patientId" />
            </rim:Name>
          </rim:ExternalIdentifier>
        </rim:ExtrinsicObject>
      </rim:RegistryObjectList>
    </query:AdhocQueryResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

XCA Query Response from sXCA: partial success

```
<soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:wsse="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">
  <soapenv:Header>
    <wsa:MessageID>urn:uuid:09ee70e4-f0c3-4b5f-b4b0-dd2b41c18536</wsa:MessageID>
    <wsa:Action soapenv:mustUnderstand="true">urn:ihe:iti:2007:CrossGatewayQueryResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:c8d1e059-06ce-43d7-8d74-deef3153eaf1</wsa:RelatesTo>
    <wsse:Security xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" soap:mustUnderstand="true">
      <wsu:Timestamp wsu:Id="TS-33">
        <wsu:Created>2014-03-13T22:36:46.087Z</wsu:Created>
```

```
        <wsu:Expires>2014-03-14T22:36:46.087Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse11:SignatureConfirmation xmlns:wsse11="http://docs.oasis-open.org/wss/oasis-wss-wssecurity-
secext-1.1.xsd"
Value="GrRRcOT4S6XUYbvMpT3lfz0IGFunURSF5mpJjPhh3onApuRJ9kIthS6i/x6TG5DPN5Uy5GJ5OyZDG7TimD9kK
Fz36xpkAFBN+5x0AwEYwU1icIJaEvvx5mLcWqlIHR1ds7urvMbscBC0r9Ug5VAqUgy7+srsjYILV51Gj4RYQKKNTlyLDc
dpd05Qlny9dx9RjNkUf9wXej3ww6mYa4V3AhHcIc3/9XOMCc9ec8m7DPpVapLPAo2ntrUFCDk7ZDD7tPwKSOVMo
ViXdrH8SB73zBSQzoncykFev0EFUTlsUhrR0fBOvcuQcGZAWErONQkqcP5mE9FOQa9FMdSmVTXH2w=="
wsu:Id="SC-42" />
    </wsse:Security>
  </soapenv:Header>
  <soapenv:Body>
    <query:AdhocQueryResponse xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
status="urn:ihe:iti:2007:ResponseStatusType:PartialSuccess">
      <rs:RegistryErrorList xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0"
highestSeverity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error">
        <rs:RegistryError errorCode="XDSRegistryError" codeContext="Registry service error: QEA XCA service did
not respond in time" location="" severity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error" />
      </rs:RegistryErrorList>
      <rim:RegistryObjectList>
        <rim:ExtrinsicObject id="urn:uuid:3548786e-63a8-11e3-bf13-d231feb1dc81" home="
urn:oid:2.16.840.1.113883.3.2591.600.3.1.1" mimeType="text/plain" objectType="urn:uuid:7edca82f-054d-
47f2-a032-9b2a5b5186c1" status="urn:oasis:names:tc:ebxml-regrep:StatusType:Approved">
          <rim:Slot name="hash">
            <rim:ValueList>
              <rim:Value>0434a0db57323d4086a3595b3ae5cc541ea6c10e</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="size">
            <rim:ValueList>
              <rim:Value>34</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="repositoryUniqueId">
            <rim:ValueList>
              <rim:Value>2.16.840.1.113883.3.2591.600.1.1.4.2</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="languageCode">
            <rim:ValueList>
              <rim:Value>en-us</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="sourcePatientId">
            <rim:ValueList>
```

```
            <rim:Value>000144^^^&amp;2.16.840.1.113883.3.2591.600.1.1.1.2&amp;ISO</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="serviceStartTime">
          <rim:ValueList>
            <rim:Value>20110909210000</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="serviceStopTime">
          <rim:ValueList>
            <rim:Value>20110910210000</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="creationTime">
          <rim:ValueList>
            <rim:Value>20111224190000</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Classification classificationScheme="urn:uuid:93606bcf-9494-43ec-9b4e-a7748d1a838d"
classifiedObject="urn:uuid:b1ed415a-633b-11e3-bf13-d231feb1dc81" id="urn:uuid:670fe53a-d621-4e69-b255-
b274d6d7c153" nodeRepresentation="">
          <rim:Slot name="authorPerson">
            <rim:ValueList>
              <rim:Value>^Welby^QEB^^MD^Dr</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorInstitution">
            <rim:ValueList>
              <rim:Value>QE B^^^^^^^^^2.16.840.1.113883.3.2591.600.1.1.2</rim:Value>
            </rim:ValueList>
            <rim:ValueList>
              <rim:Value>Some Hospital B^^^^^^^^^1.2.3.5.8.9.1789.46</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorRole">
            <rim:ValueList>
              <rim:Value>role B</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorSpecialty">
            <rim:ValueList>
              <rim:Value>Medical Doctor</rim:Value>
            </rim:ValueList>
          </rim:Slot>
          <rim:Slot name="authorTelecommunication">
            <rim:ValueList>
```

```
                <rim:Value>^^Internet^drB@qeb.org</rim:Value>
              </rim:ValueList>
            </rim:Slot>
          </rim:Classification>
          <rim:Classification id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5da"
classificationScheme="urn:uuid:41a5887f-8865-4c09-adf7-e362475b143a"
classifiedObject="urn:uuid:3548786e-63a8-11e3-bf13-d231feb1dc81" nodeRepresentation="34133-9">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
                <rim:Value>2.16.840.1.113883.6.1</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="Summarization of Episode Note" />
            </rim:Name>
          </rim:Classification>
          <rim:Classification id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5db"
classificationScheme="urn:uuid:f4f85eac-e6cb-4883-b524-f2705394840f" classifiedObject="urn:uuid:3548786e-
63a8-11e3-bf13-d231feb1dc81" nodeRepresentation="N">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
                <rim:Value>2.16.840.1.113883.5.25</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="Normal" />
            </rim:Name>
          </rim:Classification>
          <rim:Classification id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5dc"
classificationScheme="urn:uuid:a09d5840-386c-46f2-b5ad-9c3699a4309d"
classifiedObject="urn:uuid:3548786e-63a8-11e3-bf13-d231feb1dc81"
nodeRepresentation="urn:ihe:pcc:edr:2007">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
                <rim:Value>2.16.840.1.113883.3.88.12.80.73</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="Emergency Department Referral (EDR)" />
            </rim:Name>
          </rim:Classification>
          <rim:Classification id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5dd"
classificationScheme="urn:uuid:f33fb8ac-18af-42cc-ae0e-ed0b0bdb91e1" classifiedObject="urn:uuid:3548786e-
63a8-11e3-bf13-d231feb1dc81" nodeRepresentation="36125001">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
```

```
                <rim:Value>2.16.840.1.113883.6.96</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="Hospital-trauma center" />
            </rim:Name>
          </rim:Classification>
          <rim:Classification id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5de"
classificationScheme="urn:uuid:cccf5598-8b07-4b77-a05e-ae952c785ead" classifiedObject="urn:uuid:3548786e-
63a8-11e3-bf13-d231feb1dc81" nodeRepresentation="394802001">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
                <rim:Value>2.16.840.1.113883.6.96</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="General Medicine" />
            </rim:Name>
          </rim:Classification>
          <rim:Classification id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5df"
classificationScheme="urn:uuid:f0306f51-975f-434e-a61c-c59651d33983" classifiedObject="urn:uuid:3548786e-
63a8-11e3-bf13-d231feb1dc81" nodeRepresentation="34109-9">
            <rim:Slot name="codingScheme">
              <rim:ValueList>
                <rim:Value>2.16.840.1.113883.6.1</rim:Value>
              </rim:ValueList>
            </rim:Slot>
            <rim:Name>
              <rim:LocalizedString value="Evaluation and management note" />
            </rim:Name>
          </rim:Classification>
          <rim:ExternalIdentifier id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5dg"
identificationScheme="urn:uuid:2e82c1f6-a085-4c72-9da3-8640a32e42ab" registryObject="urn:uuid:3548786e-
63a8-11e3-bf13-d231feb1dc81" value="11591611577">
            <rim:Name>
              <rim:LocalizedString value="XDSDocumentEntry.uniqueId" />
            </rim:Name>
          </rim:ExternalIdentifier>
          <rim:ExternalIdentifier id="urn:uuid:1fc392f1-5458-44d2-92c7-7419309ef5dh"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427" registryObject="urn:uuid:3548786e-
63a8-11e3-bf13-d231feb1dc81"
value="382432432197^^^&amp;amp;2.16.840.1.113883.3.2591.600.1.1.1.1&amp;amp;ISO">
            <rim:Name>
              <rim:LocalizedString value="XDSDocumentEntry.patientId" />
            </rim:Name>
          </rim:ExternalIdentifier>
```

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

XCA Retrieve Response from sXCA: 2 documents returned

```
<?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://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:MessageID>urn:uuid:848ea42a-61ef-4984-9533-747c71e86827</wsa:MessageID>
    <wsa:Action
soapenv:mustUnderstand="true">urn:ihe:iti:2007:CrossGatewayRetrieveResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:851f3be0-dd0d-4e53-9dbd-84caa781a6d5</wsa:RelatesTo>
    <wsse:Security xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-
1.0.xsd" xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" soap:mustUnderstand="true">
      <wsu:Timestamp wsu:Id="TS-33">
        <wsu:Created>2014-03-13T23:07:12.637Z</wsu:Created>
        <wsu:Expires>2014-03-13T23:12:12.637Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse11:SignatureConfirmation xmlns:wsse11="http://docs.oasis-open.org/wss/oasis-wss-wssecurity-
secext-1.1.xsd"
Value="C0C4bnzR7eXGXRX5dKixg2X2JVqdTXX2J+6sqJenyGSRd/RqwZuh8rD26lXWwOTVO4xsAbP73Hfh
GWpCt4LbkpKI2cFePVp1W8NcOtBZ9M7O9/AJgD49SXYJwO13XXIIm8AxpSLMEV9k/L6cZFfyqGAU
mPrNYfsEXb2A9mer6uLSHTpeGgdtOqw6Ds0wyMuPjx+nIqrgjj61/zD/klQ4+56WqLmHrZ/d4BOP
o7IMsU5HThNhdwv+FfS+cyUfRy8R1+KIlrsH2muC2zxRlDFhF5PqgOYf4wjlQNJV9kfUkpGAuix/
9vrkFEkKpwDFp4ffMUolzVOz6rXBVP+MibAPpw==" wsu:Id="SC-42" />
    </wsse:Security>
  </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:HomeCommunityId>urn:oid:2.16.840.1.113883.3.2591.600.1.1.1</xdsb:HomeCommunityId>
        <xdsb:RepositoryUniqueId>2.16.840.1.113883.3.2591.600.1.1.4.2</xdsb:RepositoryUniqueId>
        <xdsb:DocumentUniqueId>11591611606A</xdsb:DocumentUniqueId>
        <xdsb:mimeType>text/plain</xdsb:mimeType>
        <xdsb:Document>VGhpcyBpcyBhIHRlc3QgZG9jdW1lbnQgZm9yIHhkc3J4MzMu</xdsb:Document>
      </xdsb:DocumentResponse>
      <xdsb:DocumentResponse>
        <xdsb:HomeCommunityId> urn:oid:2.16.840.1.113883.3.2591.600.1.1.1</xdsb:HomeCommunityId>
        <xdsb:RepositoryUniqueId>2.16.840.1.113883.3.2591.600.1.2.4.3</xdsb:RepositoryUniqueId>
```

```
        <xdsb:DocumentUniqueId>11591611607B</xdsb:DocumentUniqueId>
        <xdsb:mimeType>text/plain</xdsb:mimeType>
     <xdsb:Document>VGhpcyBpcyBhbm90aGVyIHRlc3QgZG9jdW1lbnQgZm9yIHhkc3J4MzMu</xdsb:Document>
       </xdsb:DocumentResponse>
    </xdsb:RetrieveDocumentSetResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

XCA Retrieve Response from sXCA: partial success

```
<?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://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:MessageID>urn:uuid:2f94a056-bf7a-4928-b93e-d79e2485e3bb</wsa:MessageID>
    <wsa:Action
soapenv:mustUnderstand="true">urn:ihe:iti:2007:CrossGatewayRetrieveResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:4ce16fe7-cba8-4c2c-8662-6e351590d902</wsa:RelatesTo>
    <wsse:Security xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-
1.0.xsd" xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" soap:mustUnderstand="true">
      <wsu:Timestamp wsu:Id="TS-33">
        <wsu:Created>2014-03-13T23:16:24.706Z</wsu:Created>
        <wsu:Expires>2014-03-13T23:21:24.706Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse11:SignatureConfirmation xmlns:wsse11="http://docs.oasis-open.org/wss/oasis-wss-wssecurity-
secext-1.1.xsd"
Value="pz/6Xx+IJbzX1qC6G9pMAfTZXsiARQ6wSFi8VPPnJe80NaAH9qP7Ny97KUORg0DxQ3hSlgf/JSln
FeRRll6gaBZjS63A4+jp/slXEF5L00C6mAOWMOlNAPis0XWnMh+E6SNJ4k1t+NrnvJrkx69QjTLD
m98g9481Oevo6SNOfTpsHig9kwDKKME2fCPLt6KhdiUuEWO3hABLDwEHREXkFvw38koLfpwCM54j
bYy9eV8ZvoEIP5ANAeAI1hm81cZ1aedMG8iWuu2+kXpLuQTSR4JmW/OA7Id2cGTxkS8hIYsCPzhk
fXnvq1i44GyNPNx1UQPa9+yoNH4UK+rJISgSCQ==" wsu:Id="SC-42" />
    </wsse:Security>
  </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:ihe:iti:2007:ResponseStatusType:PartialSuccess">
        <rs:RegistryErrorList highestSeverity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error">
          <rs:RegistryError errorCode="XDSRegistryError" codeContext="Registry service error: QEA XCA Retrieve
did not respond in time." severity="urn:oasis:names:tc:ebxml-regrep:ErrorSeverityType:Error" />
        </rs:RegistryErrorList>
      </rs:RegistryResponse>
      <xdsb:DocumentResponse>
        <xdsb:HomeCommunityId>urn:oid:2.16.840.1.113883.3.2591.600.1.1.1</xdsb:HomeCommunityId>
        <xdsb:RepositoryUniqueId>urn:oid:2.16.840.1.113883.3.2591.600.1.1.4.2</xdsb:RepositoryUniqueId>
```

```
        <xdsb:DocumentUniqueId>11591611581</xdsb:DocumentUniqueId>
        <xdsb:mimeType>text/plain</xdsb:mimeType>
        <xdsb:Document>VGhpcyBpcyB0aGUgc2Vjb25kIGRvY3VtZW50IGZvciB4ZHNyeDUzLg==</xdsb:Document>
      </xdsb:DocumentResponse>
    </xdsb:RetrieveDocumentSetResponse>
  </soapenv:Body>
</soapenv:Envelope>
```