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**IHE IT Infrastructure (ITI)  
Multi-Patient Queries  
(MPQ)**

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**Trial Implementation Supplement  
August 10, 2009**

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## Foreword

50 Integrating the Healthcare Enterprise (IHE) is an initiative designed to stimulate the integration  
of the information systems that support modern healthcare institutions. Its fundamental objective  
is to ensure that in the care of patients all required information for medical decisions is both  
correct and available to healthcare professionals. The IHE initiative is both a process and a  
forum for encouraging integration efforts. It defines a technical framework for the  
55 implementation of established messaging standards to achieve specific clinical goals. It includes  
a rigorous testing process for the implementation of this framework. And it organizes  
educational sessions and exhibits at major meetings of medical professionals to demonstrate the  
benefits of this framework and encourage its adoption by industry and users.

The approach employed in the IHE initiative is not to define new integration standards, but rather  
60 to support the use of existing standards, HL7, DICOM, IETF, and others, as appropriate in their  
respective domains in an integrated manner, defining configuration choices when necessary.  
IHE maintain formal relationships with several standards bodies including HL7, DICOM and  
refers recommendations to them when clarifications or extensions to existing standards are  
necessary.

65 This initiative has numerous sponsors and supporting organizations in different medical specialty  
domains and geographical regions. In North America the primary sponsors are the Healthcare  
Information and Management Systems Society (HIMSS) and the Radiological Society of North  
America (RSNA). IHE Canada has also been formed. IHE Europe (IHE-EUR) is supported by a  
large coalition of organizations including the European Association of Radiology (EAR) and  
70 European Congress of Radiologists (ECR), the Coordination Committee of the Radiological and  
Electromedical Industries (COCIR), Deutsche Röntgengesellschaft (DRG), the EuroPACS  
Association, Groupement pour la Modernisation du Système d'Information Hospitalier  
(GMSIH), Société Française de Radiologie (SFR), Società Italiana di Radiologia Medica  
(SIRM), the European Institute for health Records (EuroRec), and the European Society of  
75 Cardiology (ESC). In Japan IHE-J is sponsored by the Ministry of Economy, Trade, and  
Industry (METI); the Ministry of Health, Labor, and Welfare; and MEDIS-DC; cooperating  
organizations include the Japan Industries Association of Radiological Systems (JIRA), the  
Japan Association of Healthcare Information Systems Industry (JAHIS), Japan Radiological  
Society (JRS), Japan Society of Radiological Technology (JSRT), and the Japan Association of  
80 Medical Informatics (JAMI). Other organizations representing healthcare professionals are  
invited to join in the expansion of the IHE process across disciplinary and geographic  
boundaries.

The IHE Technical Frameworks for the various domains (IT Infrastructure, Cardiology,  
Laboratory, Radiology, etc.) defines specific implementations of established standards to achieve  
85 integration goals that promote appropriate sharing of medical information to support optimal  
patient care. It is expanded annually, after a period of public review, and maintained regularly  
through the identification and correction of errata. The current version for these Technical  
Frameworks may be found at [www.ihe.net/Technical\\_Framework](http://www.ihe.net/Technical_Framework).

The IHE Technical Framework identifies a subset of the functional components of the healthcare  
90 enterprise, called IHE Actors, and specifies their interactions in terms of a set of coordinated,

standards-based transactions. It describes this body of transactions in progressively greater depth. Volume I provides a high-level view of IHE functionality, showing the transactions organized into functional units called Integration Profiles that highlight their capacity to address specific clinical needs. The subsequent volumes provide detailed technical descriptions of each IHE transaction.

Comments and change proposals arising from Trial Implementation may be submitted to <http://forums.rsna.org> under the forum:

***“Integrating the Healthcare Enterprise”***

Select the sub-forum:

***“IHE IT Infrastructure 2009-2010 Supplement for Trial Implementation”***

The IHE IT Infrastructure Technical Committee will address these comments resulting from implementation, Connectathon testing, and demonstrations such as HIMSS 2010.

Details about IHE may be found at: [www.ihe.net](http://www.ihe.net)

Details about the IHE ITI may be found at: <http://www.ihe.net/Domains/index.cfm>

Details about the structure of IHE Technical Frameworks and Supplements may be found at: <http://www.ihe.net/About/process.cfm> and <http://www.ihe.net/profiles/index.cfm>

The current version of the IHE ITI Technical Framework may be found at:

[http://www.ihe.net/Technical\\_Framework/index.cfm](http://www.ihe.net/Technical_Framework/index.cfm)

These “boxed” instructions are for the author to indicate to the Volume Editor how to integrate the relevant section(s) into the overall Technical Framework

*Replace Section X.X by the following:*

## 1 Introduction

120 This supplement that will be added to the ITI Technical Framework provides a means to do queries on multiple patients, based on pre-established meta-data. This supplement contains a new transaction, Multi-Patient Stored Query between a Document Consumer, and a Document Registry. The new transaction is based on the Registry Stored Query transaction [ITI-18], using a new query catalog. The multi-patient queries will allow clinical research, quality accreditation institutions and public health organizations to make sound decisions in their field of activity. The data to be aggregated, queried, and retrieved are pertaining to XDS Affinity Domains.

### 1.1 Profile Abstract

125 Currently, the Stored Query transaction [ITI-18] defines a single catalog of queries, which require that either a single patient ID, a folder ID, or a submission set ID are present in each query. While the existing query catalog serves various healthcare integration workflows, there are other cases where aggregated queries, i.e. queries not constrained to a single patient, folder, or catalog, are necessary. The domain that is currently needing the aggregated queries is the 130 QRPH (the Quality, Research and Public Health), where data needs to be combined so that a pattern can ensue. Examples in the three areas would be repurposing, secondary use, and monitoring population health.

**Quality accreditation organizations** need to be able to aggregate data so that they can perform measurements of how institutions perform (*author* or *healthcareFacilityTypeCode*).

135 **Clinical Research** needs to be able to combine the results of different patients in a clinical trial (*typeCode*).

**Public Health** needs to have the means to make aggregated queries on certain fields such as *eventCodeList* in order to identify potential outbreaks and take appropriate decisions.

### 1.2 Open Issues and Questions

140 1. Currently this profile calls for the generation of one audit message per Patient ID present in the query response. An alternative is to generate only a single audit message (independent of how many Patient IDs present) for the query response that contains multiple Patient blocks. Any opinions?

### 1.3 Closed Issues

145 1. This supplement considered adding a new MPQ Document Registry actor and a MPQ Document Consumer actor to XDS.b, as well as a new transaction, using a new query catalog complementing the Registered Stored Query ITI-18 in the XDS.b supplement, creating a new profile addressing the issue of aggregated queries. **In the end we added a new transaction and defined two new queries that restrict parameter restrictions.**

150 2. The security requirements will be different since they can be defined separately from the existing XDS Document Registry Actor. A security assessment needs to be done.

3. The MPQ query should have at least one “key” parameter, but there can be other multiple parameters in order to serve the particular use cases. At least one parameter must be specified.
- 155 4. There is a difference between querying directly for aggregated data for statistical purposes, and querying for detailed data for more advanced purposes. Policies are to be put into place to restrict access to these types of queries, meaning that certain individuals or categories of individuals, or certain institutions can have access to one or to the other.
- 160 5. The aggregated queries for statistical purposes provide limited functionality. A list corresponding to the query with the UUID is provided. It is understood that the application performing the query will be responsible for counting. The implementation of this feature is left up to the implementers and it is out of scope of this profile. The ordering in the aggregated queries (for example by date) or will that be the user’s responsibility?
- 165 6. A mechanism for pseudonymization and how it should be used in the context of protecting the patient’s privacy, as well as providing a mechanism (when needed) to reverse it (traceability to the patient) is out of the scope of this profile.
- 170 7. This spec does not need to specify handling of homeCommunityId. The referenced Stored Query transaction’s documentation is adequate.
- 175 8. A time out value for retrieving the documents/values is not part of this profile but it is an implementation issue.
- 180 9. How will MPQ be updated so that it can reflect properly the future modifications brought in the future to the Stored Queries? Profile format changed to only show enhancements over Stored Query.
- 185 10. The vocabulary used to code the metadata is assumed to be the same across communities. This is not an assumption that is correct at this point in time. Answer: No cross-community vocabulary assumptions are made.
11. The multi-patient queries are applicable to XDS Affinity Domains but not to other local communities. However, this is an important case and it will be considered in future work. Answer: the extension of MPQ to Cross-Community environment has not yet been considered.
12. Only the FindDocuments and FindFolders Stored Queries have been extended for MPQ use. FindSubmissionSets and GetAll Stored Queries, the only other Stored Queries that have patient id as a parameter, are unsuited since there is no query parameter available that can be used to limit the scope of the query.
13. Integration of MPQ and Dsub – we believe MPQ is ready for use by DSUB and that the work of integrating the two will focus primarily on the security risk assessment.

# Volume 1 – Integration Profiles

## Glossary

*Add the following terms to the Glossary:*

## 1.7 History of Annual Changes

195

*Add the following bullet to the end of the bullet list in Section 1.7*

- Added the Multi-Patient Queries profile which allows aggregated queries to a registry.

## 2.1 Dependencies among Integration Profiles

*Add the following to Table 2-1*

MPQ	Audit Trail and Node Authentication	Each Document Registry actor and each Document Consumer shall be grouped with a Secure Node or a Secure Application Actor	Required to manage audit trail of exported PHI, node authentication and transport encryption
MPQ	Consistent Time	Each Document Registry actor and each Document Consumer shall be grouped with the Time Client Actor.	To ensure consistency among document and submission set dates

200 *Add the following section to Section 2.2*

### 2.2.25 Multi-Patient Queries Integration Profile

205 The Multi-Patient Queries profile defines a mechanism to enable aggregated queries to a Document Registry based on certain criteria needed by areas related to data analysis, such as quality accreditation of health care practitioners or health care facilities, clinical research trial data collection or population health monitoring.

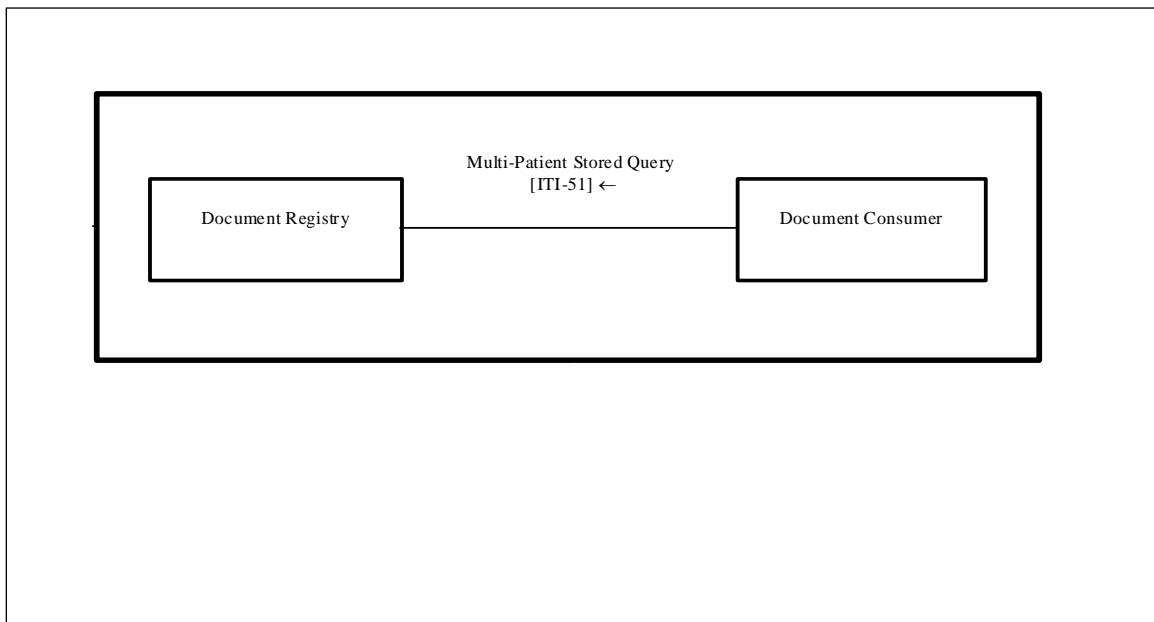
*Add Section 25*

## 25 Multi-Patient Queries Integration Profile

210 The Multi-Patient Queries profile defines a mechanism to enable aggregated queries to a Document Registry based on certain criteria needed by areas related to data analysis, such as quality accreditation of health care practitioners or health care facilities, clinical research trial data collection or population health monitoring.

### 25.1 Actors/ Transactions

215 Figure 25.1-1 shows the actors directly involved in the MPQ Integration Profile in a solely XDS Affinity Domain and the relevant transactions between them. Other actors that may be indirectly involved due to their participation in other related profiles, etc. are not necessarily shown.



**Figure 25.1-1. Multi-Patient Queries Actor Diagram**

230 Table 25.1-1 lists the transactions for each actor directly involved in the Multi-Patient Query Profile. In order to claim support of this Integration Profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” are optional. A complete list of options defined by this Integration Profile and that implementations may choose to support is listed in ITI TF-1: 25.2.

235 **Table 25.1-1. Multi-Patient Queries Integration Profile - Actors and Transactions**

Actors	Transactions	Optionality	Section in Vol. 2
Document Registry	Multi-Patient Stored Query [ITI-51]	R	ITI TF-2b: 3.51
Document Consumer	Multi-Patient Stored Query [ITI-51]	R	ITI TF-2b: 3.51

## 25.2 Multi-Patient Query Integration Profile Options

Options that may be selected for this Integration Profile are listed in Table 25.2-1 along with the Actors to which they apply. Dependencies between options when applicable are specified in notes.

240

**Table 25.2-1 MPQ - Actors and Options**

<b>Actor</b>	<b>Options</b>	<b>Vol &amp; Section</b>
Document Registry	<i>Asynchronous Web Services Exchange</i>	ITI TF-1: 25.2.2
Document Consumer	<i>Asynchronous Web Services Exchange</i>	ITI TF-1: 25.2.2

### 25.2.2 Asynchronous Web Services Exchange Option

Actors that support this option shall support the following:

245

- Document Consumer Actor shall support Asynchronous Web Services Exchange for the Multi-Patient Stored Query [ITI-51] transaction
- Document Registry Actor shall support Asynchronous Web Services Exchange for the Multi-Patient Stored Query [ITI-51] transaction

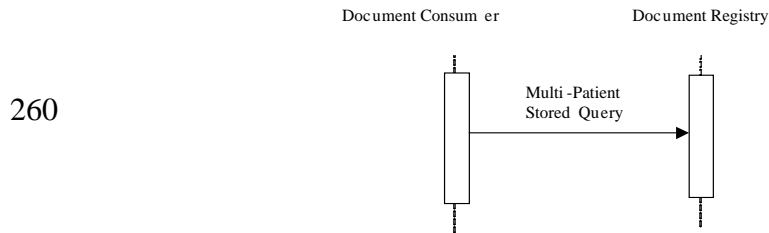
250

Use of Synchronous or Asynchronous Web Services Exchange is dictated by the individual install environment and policies. Refer to section ITI TF-2x: V.5 Synchronous and Asynchronous Web Services Exchange for an explanation of Asynchronous Web Services Exchange.

## 25.3 MPQ Process Flow

This section describes the process and information flow when a Document Consumer will query an Document Registry.

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**Figure 25.3-1: Basic Process Flow in Multi-Patient Queries Profile**

270

## 25.4 Use Cases

### 25.4.1 Multi-Patient Query used in Public Health

#### 275 Current Situation

The emergency department at Hospital A is treating patient B for certain symptoms, which are indicative of a reportable condition (such as A1H1), according to already established guidelines from an official public health agency. The symptoms mandate the use of a pre-determined value set for the XDS metadata *eventCodeList*. This can be a combination of the eventCodeList and observation such as “*influenza*” and “*possible A1H1*”. Hospital A sends any type of document capturing this information such as a Discharge Summary, an ED Encounter Summary (EDES), or in a larger sense any document intended for this purpose, using an XDS.b Provide and Register transaction to the local XDS repository, as well as a report to the appropriate public health agency P, using mechanisms which are outside the scope of this supplement.

285 After reviewing the report, the public health agency P determines that a review of recent patients’ encounters with similar symptoms is necessary. Unfortunately, the XDS Document Registry only accepts patient specific queries, as currently defined in the Stored Query transaction. The public health agency P needs to obtain a list of patients with the appropriate symptoms from the healthcare providers.

290 Hospital A queries the local Document Registry for other Document Entries containing the same event code. Since it is not possible to query for multiple patients in one operation, a query is initiated for each patient known to the Document Registry. This is very time consuming and may not be very accurate.

### **Desirable Situation**

295 The emergency department at Hospital A is treating patient B for certain symptoms, which are indicative of a reportable condition (such as A1H1), according to already established guidelines from an official public health agency. The symptoms mandate the use of a pre-determined value set for the XDS metadata *eventCodeList*. This can be a combination of the *eventCodeList* and observation such as “*influenza*” and “*possible A1H1*”. Hospital A sends any type of document capturing this information such as a Discharge Summary, an ED Encounter Summary (EDES),  
300 or in a larger sense any document intended for this purpose, using an XDS.b Provide and Register transaction to the local XDS repository, as well as a report to the appropriate public health agency P, using mechanisms which are outside the scope of this supplement.

After reviewing the report, the public health agency P determines that a review of recent  
305 patients’ encounters with similar symptoms is necessary. Using Multi-Patient Queries, the health care provider is able to provide in a timely and accurate fashion all the documents with the having the same pre-determined value in the *eventCodeList* XDS metadata to the public health agency P. The public health agency is able to initiate an appropriate response and hence to contain a possible outbreak of the A1H1.

#### **310 25.4.1.1 Post-factual and semi-real time reporting**

There are needs to aggregate data so that a pattern can emerge, but the patients’ identities need not to be known. For example, CDC (The Center for Disease Control and Prevention) or the InVS in France would like to know how many case of A1H1 are present at a national level at one point in time. In this case, there is no need to identify the patient, and unless other data is  
315 necessary to establish a trend (such as age, for example); an aggregated query on the metadata *eventCodeList* is sufficient using the *ObjectRefs* query. In this case irreversible pseudonymization or anonymization can be used since the data is employed statistically to generate a trend. This is the simplest case of implementing policies regarding security and privacy.

320 There are other cases where statistical analysis in semi-real time is desired, such as an aggregated query at a district level to do profiling by region in times of an influenza epidemic. Again, this is a situation where the patient’s identity is not needed, but the number of cases and perhaps certain parameters such as the date. In order to be able to perform the aggregated queries, there has to be a minimum data set as per HIPAA recommendations.

#### **325 25.4.1.2 Detailed queries**

If more scrutiny is needed, such as in patient safety (reporting to FDA a patient safety issue concerning medications, medical equipment malfunction, or surgical procedures), or population health monitoring such as the real-time control of an outbreak), detailed queries can be used.

330 If in the Stored Query the *LeafClass* are specified the metadata of the document or of the folder (including the document ID and Repository ID) is returned. According to policies, these metadata can be pseudonymized or not.

For the multi-patient queries for detailed use, depending on the need, the policies regarding patient's privacy are different.

### 25.4.2 Technical Use Cases

335 The output of a Multi-Patient Query can be in one of two forms: a list of opaque identifiers, each identifying a matching document (assuming that the query targets Document Entries and not Folders or Submission Sets); or full metadata where all details known in metadata are returned.

#### 25.4.2.1 Opaque Identifiers

340 Opaque identifiers, known in XDS as ObjectRefs, are useful to: discover the number of matches in the registry and then possibly to later retrieve the full metadata for the matching registry content. Applications that need only statistics (counts) can count the returned identifiers. Note that these identifiers represent documents (for example) that match the query and not patients. A single patient could have multiple matching documents.

#### 25.4.2.2 Full Metadata

345 A Multi-Patient Query can return full metadata, known as LeafClass in XDS. This metadata includes Patient Ids and patient demographics from potentially multiple patients so it is difficult to protect yet must be protected. Because of this sensitivity this type of return result would likely be only allowed by very highly trusted systems and thus this query is likely not to be available as widely as others.

### 350 25.5 Security Considerations

This profile applies the same ATNA grouping to protect against the typical XDS identified risks. This profile may be grouped with XUA to further provide authentication of the user of the result.

355 The new security and privacy considerations arise because this profile allows for a single query to result in multiple patients XDS metadata to be returned in one transaction. Although the XDS metadata is not high grade health data it is still identifiable health information and thus needs to be protected. The combination of multiple patient's protected information in the same result results in a more difficult task to assure that the intended recipient has all the authorizations necessary for the intended use. In classical XDS queries the query request/response is constrained to a single patient and therefore the access control decision can be done across the whole transaction.

360 This profile allows for two different types of return result. The ObjectRef result can be used to limit the exposure as this result will return only opaque identifiers of the matching documents. It is expected that this result would be more widely allowed. The Document Consumer can still obtain the full metadata but must use the classic XDS queries on an object-by-object basis thus allowing for transactions that are constrained to a single patient. This additional set of

transactions to retrieve the metadata may be unnecessary when the system doing the query is authorized to use the LeafClass response. For example when the querying system is known as a system that will protect the information to the same degree. Where it is known that this querying system will apply the appropriate access control prior to ultimate use or disclosure.

370

## **<Appendix A> Actor Summary Definitions**

## **<Appendix B> Transaction Summary Definitions**

375 **Multi-Patient Stored Query** - A Document Consumer actor issues a Multi-Patient Stored Query to a Document Registry to locate documents that meet the user's specified query criteria. The Document Registry returns a list of document entries pertaining to multiple patients found to meet the specified criteria, including the locations and identifier of each corresponding document in one or more Document Repository.

380

## Volume 2b - Transactions

### Add Section 3.51

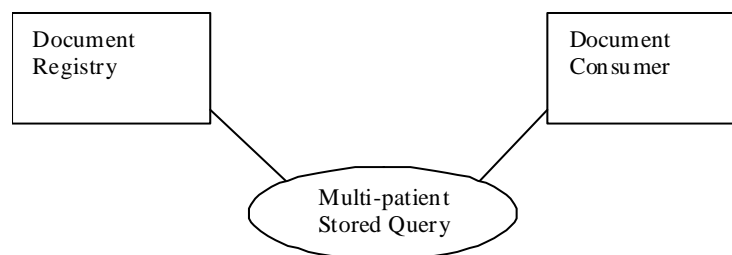
#### 3.51 Multi-Patient Stored Query

385 This section corresponds to Transaction ITI-51 of the IHE Technical Framework. Transaction ITI-51 is used by the Document Consumer and Document Registry actors.

##### 3.51.1 Scope

390 The Multi-Patient Stored Query supports a variety of queries for multiple patients. It is based on the Registry Stored Query transaction [ITI-18]. The main difference is the set of queries, which is specified in this transaction.

##### 3.51.2 Use Case Roles



**Actor:** Document Consumer

395 **Role:** Issues a Multi-Patient Stored Query to retrieve metadata based on criteria common to multiple patients

**Actor:** Document Registry

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

##### 3.51.3 Referenced Standard

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

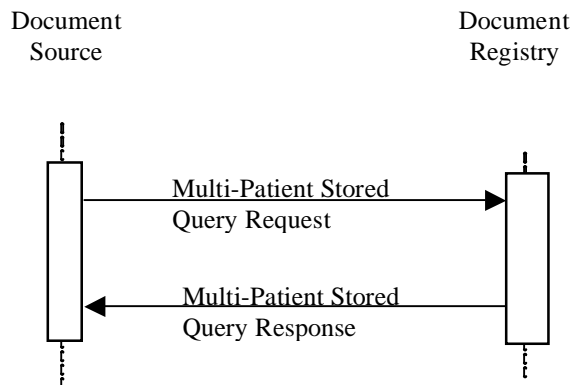
ebRIM OASIS ebXML Registry Information Model v3.0

ebRS OASIS ebXML Registry Services Specifications v3.0

ITI-18 ITI TF-2a: 3.18: Registry Stored Query

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

### 3.51.4 Interaction Diagram



#### 3.51.4.1 Multi-Patient Stored Query Request

410 This is a query request from the Document Consumer to the Document Registry. The query request contains:

- A reference to a pre-defined query stored on the Document Registry actor
- Parameters to the query

##### 3.51.4.1.1 Trigger Events

415 The message is initiated when a Document Consumer wants to query for metadata based on criteria spanning multiple patients (multiple Patient IDs).

##### 3.51.4.1.2 Message Semantics

The message semantics are identical to those documented for the Registry Stored Query [ITI-18] transaction except where noted below. The following sections document the differences.

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

##### 3.51.4.1.2.1 Query Definitions

This profile defines the following Stored Queries that may query for multiple Patient Ids.

##### 425 3.51.4.1.2.1.1 FindDocumentsForMultiplePatients

This Multi-Patient Query is semantically identical to the FindDocuments Stored Query (see ITI TF-2a: 3.18.4.1.2.3.7.1) except:

- \$XDSDocumentEntryPatientId is optional (may have zero values).

- \$XDSDocumentEntryPatientId may contain multiple values.
- 430 – At least one of the ClassCode, EventCodeList, or HealthcareFacilityTypeCode shall be specified in the provided set of parameters.

### 3.51.4.1.2.1.2 FindFoldersForMultiplePatients

This Multi-Patient Query is semantically identical to the FindFolders Stored Query (see ITI TF-2a: 3.18.4.1.2.3.7.3) except:

- 435 – \$XDSTFolderPatientId is optional (may have zero values).
- \$XDSTFolderPatientId may contain multiple values.
- \$XDSTFolderCodeList shall be a required parameter.

### 3.51.4.1.2.2 Multi-Patient Stored Query IDs

The following Query Ids shall be used to represent these queries.

440

Query Name	Query ID
FindDocumentsForMultiplePatients	urn:uuid:3d1bdb10-39a2-11de-89c2-2f44d94eaa9f
FindFoldersForMultiplePatients	urn:uuid:50d3f5ac-39a2-11de-a1ca-b366239e58df

### 3.51.4.1.2.3 Web Services Transport

The query request and response shall be transmitted using Web Services, according to the requirements specified in ITI TF-2x: Appendix V. The specific values for the WSDL describing the Multi-Patient Stored Query Service are described in this section.

- 445 The Document Registry actor shall accept a Multi-Patient Stored Query Request formatted as a SIMPLE SOAP message and respond with a Multi-Patient Stored Query Response formatted as a SIMPLE SOAP message. The Document Consumer actor shall generate the Multi-Patient Stored Query Request formatted as a SIMPLE SOAP message and accept a Multi-Patient Stored Query Response formatted as a SIMPLE SOAP message.

450 **IHE-WSP201) The attribute /wsdl:definitions/@name shall be “DocumentRegistry”.**

The following WSDL naming conventions shall apply:

- ```

wsdl:definitions/@name="DocumentRegistry":
query message      -> "MultiPatientStoredQuery_Message"
query response     -> "MultiPatientStoredQueryResponse_Message"
portType           -> "DocumentRegistry_PortType"
operation          -> "DocumentRegistry_MultiPatientStoredQuery"
SOAP 1.2 binding   -> "DocumentRegistry_Binding_Soap12"
SOAP 1.2 port      -> "DocumentRegistry_Port_Soap12"
    
```
- 455

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

- 460 These are the requirements for the Multi-Patient Stored Query transaction presented in the order in which they would appear in the WSDL definition:
- The following types shall be imported (xsd:import) in the /definitions/types section:
    - namespace="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0",  
schemaLocation="query.xsd"
  - 465 • The /definitions/message/part/@element attribute of the Multi-Patient Stored Query Request message shall be defined as "query:AdhocQueryRequest"
  - The /definitions/message/part/@element attribute of the Multi-Patient Stored Query Response message shall be defined as "query:AdhocQueryResponse"
  - 470 • The /definitions/portType/operation/input/@wsaw:Action attribute for the Multi-Patient Stored Query Request message shall be defined as "urn:ihe:iti:2009:MultiPatientStoredQuery"
  - The /definitions/portType/operation/output/@wsaw:Action attribute for the Multi-Patient Stored Query Response message shall be defined as "urn:ihe:iti:2009:MultiPatientStoredQueryResponse"
  - 475 • The /definitions/binding/operation/soap12:operation/@soapAction attribute should be defined as "urn:ihe:iti:2009:MultiPatientStoredQuery"

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

```

480 <?xml version="1.0" encoding="utf-8"?>
    <definitions ...>
      ...
      <types>
485         <xsd:schema elementFormDefault="qualified" targetNamespace="urn:ihe:iti:xds-b:2007">
            <xsd:import
                namespace="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
                schemaLocation="schema\query.xsd" />
            ...
        </xsd:schema>
490     </types>
    <message name="RegistryStoredQuery_Message">
      <documentation>Multi-Patient Stored Query</documentation>
      <part name="body" element="query:AdhocQueryRequest" />
    </message>
495 <message name="RegistryStoredQueryResponse_Message">
      <documentation>Multi-Patient Stored Query Response</documentation>
      <part name="body" element="query:AdhocQueryResponse" />
    </message>
    ...
500 <portType name="MPQRegistry_PortType">
      <operation name="MultiPatientStoredQuery">
        <input message="ihe:RegistryStoredQuery_Message"
            wsaw:Action="urn:ihe:iti:2009:MultiPatientStoredQuery" />
        <output message="ihe:RegistryStoredQueryResponse_Message"
            wsaw:Action="urn:ihe:iti:2009:MultiPatientStoredQueryResponse" />
505      </operation>
      ...
    </portType>
    ...
510 </definitions>

```

A full WSDL for the Document Consumer and Document Registry actors is found in ITI TF-2x: Appendix W.

### 3.51.4.1.2.4 Sample SOAP Messages

515 The samples in the following two sections show a typical SOAP request and its relative SOAP response. The sample messages also show the WS-Addressing headers `<a:Action/>`, `<a:MessageID/>`, `<a:ReplyTo/>`...; these WS-Addressing headers are populated according to ITI TF-2x: Appendix V: Web Services for IHE Transactions. The body of the SOAP message is omitted for brevity; in a real scenario the empty element will be populated with the appropriate metadata.

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

#### 3.51.4.1.2.4.1 Sample Multi-Patient Stored Query SOAP Request

```

525 <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
      xmlns:a="http://www.w3.org/2005/08/addressing">
530   <s:Header>
        <a:Action s:mustUnderstand="1">urn:ihe:iti:2009:MultiPatientStoredQuery</a:Action>
        <a:MessageID>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:MessageID>
        <a:ReplyTo s:mustUnderstand="1">>
          <a:Address>http://www.w3.org/2005/08/addressing/anonymous</a:Address>
535   </a:ReplyTo>
        <a:To>http://localhost/service/IHEMPQRegistry.svc</a:To>
      </s:Header>
      <s:Body>
        <query:AdhocQueryRequest
540         xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
         xmlns:rims="urn:oasis:names:tc:ebxml-regrep:xsd:rims:3.0"
         xmlns:rs="urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0">
          <query:ResponseOption returnComposedObjects="true" returnType="LeafClass"/>
          <!-- FindDocumentsForMultiplePatients -->
          <rims:AdhocQuery id="urn:uuid:3d1bdb10-39a2-11de-89c2-2f44d94eaa9f">
            <rims:Slot name="$XDSDocumentEntryStatus">
              <rims:ValueList>
545               <rims:Value>('urn:oasis:names:tc:ebxml-
                    regrep:ResponseStatusType:Approved')</rims:Value>
              </rims:ValueList>
            </rims:Slot>
            <rims:Slot name="$XDSDocumentEntryClassCode">
              <rims:ValueList>
550               <rims:Value>'26436-6'</rims:Value>
              </rims:ValueList>
            </rims:Slot>
            <rims:Slot name="$XDSDocumentEntryClassCodeScheme">
              <rims:ValueList>
555               <rims:Value>'LOINC'</rims:Value>
              </rims:ValueList>
            </rims:Slot>
          </rims:AdhocQuery>
          <!-- Note the lack of a specification of the $XDSDocumentEntryPatientId parameter
560   -->
        </query:AdhocQueryRequest>
      </s:Body>
    </s:Envelope>
565

```

570 **3.51.4.1.2.4.2 Sample Multi-Patient Stored Query SOAP Response**

```

570 <s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
575 xmlns:a="http://www.w3.org/2005/08/addressing">
    <s:Header>
        <a:Action
575 s:mustUnderstand="1">urn:ihe:iti:2009:MultiPatientStoredQueryResponse</a:Action>
        <a:RelatesTo>urn:uuid:def119ad-dc13-49c1-a3c7-e3742531f9b3</a:RelatesTo>
    </s:Header>
    <s:Body>
580 <query:AdhocQueryResponse
        xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0"
        status="urn:oasis:names:tc:ebxml-regrep:ResponseStatusType:Success">
        <rim:RegistryObjectList xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">
585
            <!-- Internal details of ExtrinsicObjects are not shown -->
590
            <rim:ExtrinsicObject/>
            <rim:ExtrinsicObject/>
            <rim:ExtrinsicObject/>
            <rim:ExtrinsicObject/>
            <rim:ExtrinsicObject/>
            <rim:ExtrinsicObject/>
            </rim:RegistryObjectList>
        </query:AdhocQueryResponse>
595 </s:Body>
</s:Envelope>
    
```

**3.51.4.1.3 Expected Actions**

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

**3.51.5 Security Considerations**

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

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

**3.51.5.1 Security Audit Considerations**

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

**3.51.5.1.1 Document Consumer audit message:**

|                                                      | Field Name            | Opt | Value Constraints                                        |
|------------------------------------------------------|-----------------------|-----|----------------------------------------------------------|
| <b>Event</b><br>AuditMessage/<br>EventIdentification | EventID               | M   | EV(110112, DCM, "Query")                                 |
|                                                      | EventActionCode       | M   | "E" (Execute)                                            |
|                                                      | EventDateTime         | M   | not specialized                                          |
|                                                      | EventOutcomeIndicator | M   | not specialized                                          |
|                                                      | EventTypeCode         | M   | EV("ITI-51", "IHE Transactions", "Multi-Patient Query")0 |

|                                             |
|---------------------------------------------|
| <b>Source (Document Consumer) (1)</b>       |
| <b>Human Requestor (0..n)</b>               |
| <b>Destination (Document Registry) (1)</b>  |
| <b>Audit Source (Document Consumer) (1)</b> |
| <b>Patient (1)</b>                          |
| <b>Query Parameters(1)</b>                  |

Where:

|                                                                         |                            |    |                                                                                    |
|-------------------------------------------------------------------------|----------------------------|----|------------------------------------------------------------------------------------|
| <b>Source</b><br>AuditMessage/<br>ActiveParticipant                     | UserID                     | C  | When WS-Addressing is used: <ReplyTo/>                                             |
|                                                                         | AlternativeUserID          | M  | the process ID as used within the local operating system in the local system logs. |
|                                                                         | UserName                   | U  | not specialized                                                                    |
|                                                                         | UserIsRequestor            | M  | “true”                                                                             |
|                                                                         | RoleIDCode                 | M  | EV(110153, DCM, “Source”)                                                          |
|                                                                         | NetworkAccessPointTypeCode | M  | “1” for machine (DNS) name, “2” for IP address                                     |
|                                                                         | NetworkAccessPointID       | M  | The machine name or IP address, as specified in RFC 3881.                          |
| <b>Human Requestor (if known)</b><br>AuditMessage/<br>ActiveParticipant | UserID                     | M  | Identity of the human that initiated the transaction.                              |
|                                                                         | AlternativeUserID          | U  | not specialized                                                                    |
|                                                                         | UserName                   | U  | not specialized                                                                    |
|                                                                         | UserIsRequestor            | M  | “true”                                                                             |
|                                                                         | RoleIDCode                 | U  | Access Control role(s) the user holds that allows this transaction.                |
|                                                                         | NetworkAccessPointTypeCode | NA |                                                                                    |
|                                                                         | NetworkAccessPointID       | NA |                                                                                    |

|                                                          |                            |   |                                                           |
|----------------------------------------------------------|----------------------------|---|-----------------------------------------------------------|
| <b>Destination</b><br>AuditMessage/<br>ActiveParticipant | UserID                     | M | SOAP endpoint URI.                                        |
|                                                          | AlternativeUserID          | U | not specialized                                           |
|                                                          | UserName                   | U | not specialized                                           |
|                                                          | UserIsRequestor            | M | “false”                                                   |
|                                                          | RoleIDCode                 | M | EV(110152, DCM, “Destination”)                            |
|                                                          | NetworkAccessPointTypeCode | M | “1” for machine (DNS) name, “2” for IP address            |
|                                                          | NetworkAccessPointID       | M | The machine name or IP address, as specified in RFC 3881. |

610

|                                                                   |                       |   |                  |
|-------------------------------------------------------------------|-----------------------|---|------------------|
| <b>Audit Source</b><br>AuditMessage/<br>AuditSourceIdentification | AuditSourceID         | U | Not specialized. |
|                                                                   | AuditEnterpriseSiteID | U | not specialized  |
|                                                                   | AuditSourceTypeCode   | U | not specialized  |

|                                                                           |                                |   |                                   |
|---------------------------------------------------------------------------|--------------------------------|---|-----------------------------------|
| <b>Patient</b><br>(AuditMessage/<br>ParticipantObjectIdentifi-<br>cation) | ParticipantObjectTypeCode      | M | “1” (Person)                      |
|                                                                           | ParticipantObjectTypeCodeRole  | M | “1” (Patient)                     |
|                                                                           | ParticipantObjectDataLifeCycle | U | not specialized                   |
|                                                                           | ParticipantObjectIDTypeCode    | M | EV(2, RFC-3881, “Patient Number”) |
|                                                                           | ParticipantObjectSensitivity   | U | not specialized                   |
|                                                                           | ParticipantObjectID            | M | The patient ID in HL7 CX format.  |
|                                                                           | ParticipantObjectName          | U | not specialized                   |

|                                                                               |                                       |                        |                                                         |
|-------------------------------------------------------------------------------|---------------------------------------|------------------------|---------------------------------------------------------|
| <b>Query Parameters</b><br>(AuditMessage/<br>ParticipantObjectIdentification) | <i>ParticipantObjectQuery</i>         | <i>U</i>               | <i>not specialized</i>                                  |
|                                                                               | <i>ParticipantObjectDetail</i>        | <i>U</i>               | <i>not specialized</i>                                  |
|                                                                               | ParticipantObjectTypeCode             | M                      | “2” (system object)                                     |
|                                                                               | ParticipantObjectTypeCodeRole         | M                      | “24” (query)                                            |
|                                                                               | <i>ParticipantObjectDataLifeCycle</i> | <i>U</i>               | <i>not specialized</i>                                  |
|                                                                               | ParticipantObjectIDTypeCode           | M                      | EV(“ITI-51”, “IHE Transactions”, “Multi-Patient Query”) |
|                                                                               | <i>ParticipantObjectSensitivity</i>   | <i>U</i>               | <i>not specialized</i>                                  |
|                                                                               | ParticipantObjectID                   | M                      | Stored Query ID (UUID)                                  |
|                                                                               | <i>ParticipantObjectName</i>          | <i>C</i>               | If known the value of <ihe:HomeCommunityId/>            |
|                                                                               | <i>ParticipantObjectQuery</i>         | <i>M</i>               | the AdhocQueryRequest, base64 encoded.                  |
| <i>ParticipantObjectDetail</i>                                                | <i>U</i>                              | <i>not specialized</i> |                                                         |

**3.51.5.1.2 Document Registry audit message:**

|                                                      | Field Name                   | Opt      | Value Constraints                                       |
|------------------------------------------------------|------------------------------|----------|---------------------------------------------------------|
| <b>Event</b><br>AuditMessage/<br>EventIdentification | EventID                      | M        | EV(110112, DCM, “Query”)                                |
|                                                      | EventActionCode              | M        | “E” (Execute)                                           |
|                                                      | <i>EventDateTime</i>         | <i>M</i> | <i>not specialized</i>                                  |
|                                                      | <i>EventOutcomeIndicator</i> | <i>M</i> | <i>not specialized</i>                                  |
|                                                      | EventTypeCode                | M        | EV(“ITI-51”, “IHE Transactions”, “Multi-Patient Query”) |
| <b>Source (Document Consumer) (1)</b>                |                              |          |                                                         |
| <b>Destination (Document Registry) (1)</b>           |                              |          |                                                         |
| <b>Audit Source (Document Registry) (1)</b>          |                              |          |                                                         |
| <b>Patient (0..1)</b>                                |                              |          |                                                         |
| <b>Query Parameters(1)</b>                           |                              |          |                                                         |

Where:

|                                                     |                            |          |                                                           |
|-----------------------------------------------------|----------------------------|----------|-----------------------------------------------------------|
| <b>Source</b><br>AuditMessage/<br>ActiveParticipant | UserID                     | <i>C</i> | When WS-Addressing is used: <ReplyTo/>                    |
|                                                     | AlternativeUserID          | <i>U</i> | <i>not specialized</i>                                    |
|                                                     | <i>UserName</i>            | <i>U</i> | <i>not specialized</i>                                    |
|                                                     | UserIsRequestor            | M        | “true”                                                    |
|                                                     | RoleIDCode                 | M        | EV(110153, DCM, “Source”)                                 |
|                                                     | NetworkAccessPointTypeCode | M        | “1” for machine (DNS) name, “2” for IP address            |
|                                                     | NetworkAccessPointID       | M        | The machine name or IP address, as specified in RFC 3881. |

|                                                          |                            |          |                                                                                    |
|----------------------------------------------------------|----------------------------|----------|------------------------------------------------------------------------------------|
| <b>Destination</b><br>AuditMessage/<br>ActiveParticipant | UserID                     | M        | SOAP endpoint URI.                                                                 |
|                                                          | <i>AlternativeUserID</i>   | M        | the process ID as used within the local operating system in the local system logs. |
|                                                          | <i>UserName</i>            | <i>U</i> | <i>not specialized</i>                                                             |
|                                                          | UserIsRequestor            | M        | “false”                                                                            |
|                                                          | RoleIDCode                 | M        | EV(110152, DCM, “Destination”)                                                     |
|                                                          | NetworkAccessPointTypeCode | M        | “1” for machine (DNS) name, “2” for IP address                                     |
|                                                          | NetworkAccessPointID       | M        | The machine name or IP address, as specified in RFC 3881.                          |

## IHE Technical Framework Supplement - Multi-Patient Queries (MPQ)

|                                                                               |                              |          |                         |
|-------------------------------------------------------------------------------|------------------------------|----------|-------------------------|
| <b>Audit Source</b><br><br><b>AuditMessage/<br/>AuditSourceIdentification</b> | <i>AuditSourceID</i>         | <i>U</i> | <i>Not specialized.</i> |
|                                                                               | <i>AuditEnterpriseSiteID</i> | <i>U</i> | <i>not specialized</i>  |
|                                                                               | <i>AuditSourceTypeCode</i>   | <i>U</i> | <i>not specialized</i>  |

|                                                                                                 |                                       |          |                                                                |
|-------------------------------------------------------------------------------------------------|---------------------------------------|----------|----------------------------------------------------------------|
| <b>Patient</b><br><br><b>(AuditMessage/<br/>ParticipantObjectIdentifi-<br/>cation)</b>          | <i>ParticipantObjectTypeCode</i>      | <i>M</i> | <i>“1” (Person)</i>                                            |
|                                                                                                 | <i>ParticipantObjectTypeCodeRole</i>  | <i>M</i> | <i>“1” (Patient)</i>                                           |
|                                                                                                 | <i>ParticipantObjectDataLifeCycle</i> | <i>U</i> | <i>not specialized</i>                                         |
|                                                                                                 | <i>ParticipantObjectIDTypeCode</i>    | <i>M</i> | <i>EV(2, RFC-3881, “Patient Number”)</i>                       |
|                                                                                                 | <i>ParticipantObjectSensitivity</i>   | <i>U</i> | <i>not specialized</i>                                         |
|                                                                                                 | <i>ParticipantObjectID</i>            | <i>M</i> | <i>The patient ID in HL7 CX format.</i>                        |
|                                                                                                 | <i>ParticipantObjectName</i>          | <i>U</i> | <i>not specialized</i>                                         |
|                                                                                                 | <i>ParticipantObjectQuery</i>         | <i>U</i> | <i>not specialized</i>                                         |
|                                                                                                 | <i>ParticipantObjectDetail</i>        | <i>U</i> | <i>not specialized</i>                                         |
| <b>Query Parameters</b><br><br><b>(AuditMessage/<br/>ParticipantObjectIdentifi-<br/>cation)</b> | <i>ParticipantObjectTypeCode</i>      | <i>M</i> | <i>“2” (system object)</i>                                     |
|                                                                                                 | <i>ParticipantObjectTypeCodeRole</i>  | <i>M</i> | <i>“24” (query)</i>                                            |
|                                                                                                 | <i>ParticipantObjectDataLifeCycle</i> | <i>U</i> | <i>not specialized</i>                                         |
|                                                                                                 | <i>ParticipantObjectIDTypeCode</i>    | <i>M</i> | <i>EV(“ITI-51”, “IHE Transactions”, “Multi-Patient Query”)</i> |
|                                                                                                 | <i>ParticipantObjectSensitivity</i>   | <i>U</i> | <i>not specialized</i>                                         |
|                                                                                                 | <i>ParticipantObjectID</i>            | <i>M</i> | <i>Stored Query ID (UUID)</i>                                  |
|                                                                                                 | <i>ParticipantObjectName</i>          | <i>C</i> | <i>If known the value of &lt;ihe:HomeCommunityId/&gt;</i>      |
|                                                                                                 | <i>ParticipantObjectQuery</i>         | <i>M</i> | <i>the AdhocQueryRequest, base64 encoded.</i>                  |
|                                                                                                 | <i>ParticipantObjectDetail</i>        | <i>U</i> | <i>not specialized</i>                                         |