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Initialization Tests

For Prospective QHIN-to-QHIN Exchange Testing

1   INTRODUCTION, SCOPE, ORGANIZATION

Please see *Testing Program Overview* for higher level information about the testing environment. That document includes a broad overview of the process, applications and documentation for the QHIN Testing Program; a list of all QHIN test cases, documentation, conformity assessment checklists; and a description of content tests for the RCE/QHIN Testing Program.

This document, *Initialization Tests*, describes tasks to be performed by prospective QHINs initialize their systems with test data and configuration information.

Test patient demographics and clinical information are based on data from the Synthea Project. Details on provenance of the data and transformations are provided in Section 4.

2 TESTS FOR INITIATING QHIN

2.1 Load Data as Initiating System

IG Load Initiating Patient Data: Load Patients Known by the Initiating Gateway

Test Case ID:	IG Load Initiating Patient Data
Title:	Load Patients Known by the Initiating Gateway
QTF Function / Technology:	Testing Procedure Supporting Requirements
QTF Requirement:	QTF-107
Optionality:	Required

Purpose/Description

This test describes the mechanism for loading test patients that will be accessed by the Initiating Gateway during the testing process. There is a similar test with different patients for the Responding Gateway. We recommend you read both tests before you begin the process. You will likely find similarities in how you prepare your system.

Preconditions

The RCE has created four separate test patients with clinical records to be used in the testing process. The table below lists the two patients that are used for testing the Initiating Gateway.

Patient Name	Description
QTFTEST-001, QTF TEST	This patient is used when your system is actively pushing documents using the Message Delivery Scenario. You will load data and/or documents for this test patient so you can push one or more documents when requested.
QTFTEST-002, QTF TEST	This patient is used when your system is retrieving documents using the Document Query & Retrieve Scenario. You create this test patient in your system with demographics, but you do not include any of the clinical record associated with the patient. You will be instructed to query for documents and to retrieve them.

Test Steps

Note: The steps assume a workflow for creating records. You will enter the appropriate data in your gateway and source systems in a way that will prepare you for testing. For example, we might state that you are to create documents. Your network might store individual data items and produce documents on demand.

1. Download the test data for release 1.0.0 found here. The release data contains equivalent files in CCD documents and csv files.
2. Create a patient history for patient QTFTEST-001, QTF TEST using the demographics and clinical data provided. You need to create enough of a clinical record to be able to push C-CDA documents to the testing system when requested. You will not be tested on specific content, so you do not need to include all clinical data provided. You do need to include the proper patient demographics and not substitute other demographic data.
3. Create a patient demographic record for QTFTEST-002, QTF TEST using the demographics supplied. You need the demographic record because you will perform a patient search of the testing system with those demographics. Do not load the clinical data; you will query for and retrieve documents for this test patient.
4. Email the test manager when this task is complete: testing@sequoiaproject.org.

Assessment

1. Accept the email as proof of completion. If the user did not complete the task, future tests will fail.

Referenced Specifications

Change History

Date	Changes
April 1, 2022	Initial Draft Version

3 TESTS FOR RESPONDING QHIN

3.1 Load Data as Responding System

RG Load Responding Patient Data: Load Patients Known by the Responding Gateway

Test Case ID:	RG Load Initiating Patient Data
Title:	Load Patients Known by the Responding Gateway
QTF Function / Technology:	Testing Procedure Supporting Requirements
QTF Requirement:	QTF-107
Optionality:	Required

Purpose/Description

This test describes the mechanism for loading test patients that will be accessed by the Responding Gateway during the testing process. There is a similar test with different patients for the Initiating Gateway. We recommend you read both tests before you begin the process. You will likely find similarities in how you prepare your system.

Preconditions

The RCE has created four separate test patients with clinical records to be used in the testing process. The table below lists the two patients that are used for testing the Responding Gateway.

Patient Name	Description
QTFTEST-003, QTF TEST	This patient is used when your system is accepting documents using the Message Delivery scenario. You will load patient demographics only so you are ready to accept the documents that are submitted to you.

Patient Name	Description
QTFTEST-004, QTF TEST	This patient is used when your system is supplying documents using the Document Query & Retrieve scenario. You create this test patient in your system with demographics and sufficient clinical data to respond to document query and document retrieve requests.

Test Steps

Note: The steps assume a workflow for creating records. You will enter the appropriate data in your gateway and source systems in a way that will prepare you for testing. For example, we might state that you are to create documents. Your network might store individual data items and produce documents on demand.

1. Download the test data for release 1.0.0 found here. The release data contains equivalent files in CCD documents and csv files.
2. Create a patient demographic record for patient QTFTEST-003, QTF TEST using the demographics provided. You need the demographic record because you will accept documents for this patient that are pushed by the testing system. Do not load the clinical data.
3. Create a patient history for patient QTFTEST-004, QTF TEST using the demographics and clinical data provided. You need to create enough of a clinical record to be able to respond to document query and retrieve requests initiated by the testing system. You will not be tested on specific content, so you do not need to include all clinical data provided. You do need to include the proper patient demographics and not substitute other demographic data.
4. Email the test manager when this task is complete: testing@sequoiaproject.org.

Assessment

1. Accept the email as proof of completion. If the user did not complete the task, future tests will fail.

Referenced Specifications

Change History

Date	Changes
April 1, 2022	Initial Draft Version

4   DATA PROVENANCE

Test patient demographics and clinical information are based on data from the Synthea Project. From the Synthea Github repository:

> Synthea^{TM} is a Synthetic Patient Population Simulator. The goal is to output synthetic, realistic (but not real), patient data and associated health records in a variety of formats.

We used a snapshot of data (November, 2021) published as Synthea Sample Data. The C-CDA zip provided Continuity of Care documents for over 500 synthetic subjects. The CSV zip provided individual data items as CSV files for those same subjects.

We selected four subjects that had patient histories covering a range of data (Encounters, Medications, Allergies/Intolerances, …) that would be useful for the document types used in testing. We reduced the data for each patient using arbitrary date ranges to reduce the size of the CCD documents as well as the number of data items in the CSV files. We modified the patient names to match the QTF requirements on test data. Other than changing patient names and removing data, we made no other changes to the clinical data from the sample data snapshot. The modified CCD files are included in the test environment.

The Synthea data includes sample Continuity of Care documents but does not include other types of documents used in testing. The C-CDA-Examples Github repository from HL7 provides examples of the other document types needed for testing. We extracted samples from that project and edited the files by hand to create the files needed in the testing environment. The patient demographic information in these files was modified to match the patient demographics in the CCD files. The clinical information from these files may or may not be consistent with the clinical information in the Synthea-based CCD files.

You will be given instructions in Section 5 about the demographic and clinical information to use for the various test scenarios. In general:

- You will be required to use the patient demographics in order to support Patient Discovery queries and associated Find Document and Retrieve Document requests.

- You will not be tested on the clinical data found in the samples. You can use the samples to populate your own test environment, but this is not a requirement. You are welcome to use other clinical data that may exist in your environment as long as you use the defined patient demographics.
- You are required to produce valid C-CDA 2.1 documents, and those will be tested for conformance.

5   PATIENT DATA DETAILS

The test procedures use four separate patients. The origin and provenance of the patient data is described in Section 4 (Data Provenance). The four subsections provide details and guidance on how you will use the data during testing. This table provides a summary of how each patient is used during testing.

Patient	Actor Tested	Scenario Tested
QTFTEST-001	Initiating Gateway	Message Delivery
QTFTEST-002	Initiating Gateway	Document Query
QTFTEST-003	Responding Gateway	Message Delivery
QTFTEST-004	Responding Gateway	Document Query

5.1   Patient QTFTEST-001

Patient QTFTEST-001, QTF TEST is used when testing the Initiating Gateway in the Message Delivery Scenario. This is the scenario where you actively push documents to a Responding Gateway.

Patient Demographics

The table below contains demographic information for patient QTFTEST-001. The column with the label "Tested" will be marked with an X when that value will be tested at some point during the process. Not all demographic attributes are tested, and you are allowed to substitute different values.

Attribute	Value	Tested
Family Name	QTFTEST-001	X
Given Name	QTF TEST	X
Date of Birth	19580918	X
Time of Birth	002251	
Administrative Gender	F (2.16.840.1.113883.5.1)	X

Attribute	Value	Tested
Race Code	2106-3 (2.16.840.1.113883.6.238)	
Ethnic Group Code	2186-5 (2.16.840.1.113883.6.238)	
Home Address	577 Schmeler Frontage road Unit 7 Quincy, MA 02169	
Alias	Gutmann970, Maddie576 (Original Synthea patient name. There is no requirement that you track/include alias information.)	

Clinical Data Overview

Example clinical data are provided to help you build a patient record with the purpose of sending documents in the Message Delivery Scenario.

1. You will not be tested on the clinical content; that means you can substitute other content if that simplifies your preparation. You do have to create enough of a record in your systems to produce clinical documents.
   a. The synthetic data for this patient indicates that she died at the age of 51. You are not required to include that fact as you construct a patient record.
2. You will be required to submit example documents for all versions of software and systems in your network. If you have three network participants that create CCD documents with different software, you will be tested for each of those three versions of CCD submission.
3. While you are not tested on clinical content, the metadata used when submitting documents will be tested. Details for each document type are given below.

Clinical Document Types

The QHIN Technical Framework lists requirements and suggestions for different document types (CCD, Progress Note, etc.). This section will not repeat those line items nor provide guidance on the types of documents your network needs to produce. You will have discussions with a Testing Manager to review those requirements. This section provides overall guidance based on document type.

Continuity of Care Document: The original Synthea sample data provides an example CCD that covers a long patient history. We have reduced that document to produce a shorter version that spans a select portion of the patient's life. If you are testing a CCD, we recommend you base that document on a shorter patient history so that you do not create a document larger than needed

for testing. We will test the document metadata and general structure of the CCD, but we will not test specific content. There are tests for using code values from proper value sets.

Progress Note: The Synthea sample data did not include a Progress Note nor did we create a sample. As with the Continuity of Care Document, we recommend you create a short Progress Note that meets the C-CDA 2.1 requirements and uses coded values from proper value sets. You do not need to correlate data in the Progress Note with data in the CCD.

Discharge Summary: The Synthea sample data did not include a Discharge Summary. We did create and include an example. You may use the data in the sample as a model or you may use your own clinical data to populate the Discharge Summary. You do not need to correlate data in the Discharge Summary with data in the CCD or data in the Progress Note.

Unstructured Document: The Unstructured Document is assumed to contain a PDF document that can be of any type. We have included a sample Unstructured Document that contains a lab report, but you can include any type of embedded document. Please take care with coded values in both the Unstructured Document itself and XDS metadata.

Other Document Types: The first phase of testing focuses on the document types listed above. If you have other types of documents that you will be sending to a Responding QHIN, please discuss this with the Testing Manager. The testing platform can be extended for other types.

Document Metadata

There are multiple Document Entry metadata attributes to consider. In some cases, the value is fixed by specification. In other cases, the value must be taken from a value set, but a specific value is not required. Other attributes may not be required, and tests for such attributes are not included. Please see Section 7 of this document for a detailed description on document metadata testing.

5.2   Patient QTFTEST-002

Patient QTFTEST-002, QTF TEST is used when testing the Initiating Gateway in the Document Query Scenario. This is the scenario where you retrieve documents to a Responding Gateway.

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Patient Demographics

The table below contains demographic information for patient QTFTEST-002.

Attribute	Value	Tested
Family Name	QTFTEST-002	
Given Name	QTF TEST	
Date of Birth	19931212	
Time of Birth	091854	
Administrative Gender	F (2.16.840.1.113883.5.1)	
Race Code	2106-3 (2.16.840.1.113883.6.238)	
Ethnic Group Code	2186-5 (2.16.840.1.113883.6.238)	
Home Address	1085 Grant Boulevard Marblehead, MA	
Alias	Stokes453, Oneida64 (Original Synthea patient name. There is no requirement that you track/include alias information.)	

Clinical Data Overview

You do not have to create a clinical record for this patient. The test procedure will require that you query and retrieve documents. The table below contains the list of documents that are found in the simulated communities

5.3   Patient QTFTEST-003

Patient QTFTEST-003, QTF TEST is used when testing the Responding Gateway in the Message Delivery Scenario. This is the scenario where documents are pushed to your Responding Gateway. Your Responding Gateway will also be tested using Patient Discovery queries for this patient.

Patient Demographics

The table below contains demographic information for patient QTFTEST-003. The column with the label "Tested" will be marked with an X when that value will be tested at some point during the process.

Attribute	Value	Tested
Family Name	QTFTEST-003	X
Given Name	QTF TEST	X
Date of Birth	19730402	X

Attribute	Value	Tested
Time of Birth	143232	
Administrative Gender	F (2.16.840.1.113883.5.1)	X
Race Code	2028-9 (2.16.840.1.113883.6.238)	
Ethnic Group Code	2186-5 (2.16.840.1.113883.6.238)	
Home Address	239 Upton Walk Lowell, MA 01852	
Alias	Murphy561, Terrilyn343 (Original Synthea patient name. There is no requirement that you track/include alias information.)	

5.4 Patient QTFTEST-004

Patient QTFTEST-004, QTF TEST is used when testing the Responding Gateway in the Document Query Scenario. This is the scenario where your Responding Gateway responds to Find Document and Retrieve Document requests. Your Responding Gateway will also be tested using Patient Discovery queries for this patient.

Patient Demographics

The table below contains demographic information for patient QTFTEST-004. The column with the label "Tested" will be marked with an X when that value will be tested at some point during the process.

Attribute	Value	Tested
Family Name	QTFTEST-004	X
Given Name	QTF TEST	X
Date of Birth	20110115	X
Time of Birth	084507	
Administrative Gender	F (2.16.840.1.113883.5.1)	X
Race Code	2106-3 (2.16.840.1.113883.6.238)	
Ethnic Group Code	2186-5 (2.16.840.1.113883.6.238)	
Home Address	359 Schmitt Track Unit 80 Somerville, MA 02155	
Alias	Barton704, Eustolia154 (Original Synthea patient name. There is no requirement that you track/include alias information.)	

Clinical Data Overview

Please read *Clinical Data Overview* in Section 5.1 (Patient QTFTEST-001). Because you are responding to requests for documents, the same guidance applies to your system. You will need to generate documents and appropriate metadata based on the participants in your network.

Clinical Document Types

Please read *Clinical Document Types* in Section 5.1 (Patient QTFTEST-001).

Document Metadata

Please read *Document Metadata* in Section 5.1 (Patient QTFTEST-001). Your Responding Gateway needs to provide accurate metadata when responding to Find Document requests. Your system also needs to be able to filter responses based on metadata values in those Find Document Requests.

6 VALUE SETS

Coded values included in XDS metadata must be selected from value sets provided by the RCE. This is both a testing issue and an interoperability issue when in production. These are translated into an XML document that is used by the Sequoia Interoperability Testing Platform (ITP) infrastructure. One can download the file *codes.xml* from the Sequoia ITP to see the values configured in the tool.

7 DOCUMENT METADATA – MESSAGE DELIVERY SCENARIO

Table 4.3.1-2 in IHE TF 3:4.3.1 Defines requirements for document metadata as part of a submission process. The sections below describe the metadata values that will be tested, considering the document type and baseline requirements (R, R2, O).

- Some attributes will be tested for specific values
- Some attributes will be tested to ensure they are taken from a defined value set (not a specific value).
- The values of some attributes are not tested (author, creation time) even if that attribute is required.
- Optional attributes are not tested.

7.1   Document Entry Metadata Testing -Message Delivery

Metadata Attribute	Optionality (Initiating Gateway)	Testing Notes
author	R2	If present, suggested values; see below
availabilityStatus	O	Not tested
classCode	R	classCode Value Set; see below
comments	O	Not tested
confidentialityCode	R	Must be from confidentialityCode Value Set
creationTime	R	Suggested range; see below
entryUUID	R	Generated by IG; tested for format
eventCodeList	O	Not tested
formatCode	R	Depends on document type; see below
hash	O	If present, tested for correct value
healthcareFacilityTypeCode	R	Must be from healthcareFacilityTypeCode Value Set
homeCommunityId	O	If present, tested for value; see below
languageCode	R	Must be from languageCode Value Set
legalAuthenticator	O	Not tested.
limitedMetadata	X	Does not apply; not tested
mimeType	R	Depends on document type; see below
objectType	R	Tested for one value defined by specification; see below
patientId	R	Must match value provided by test system
practiceSettingCode	R	Must be from practiceSettingCode Value Set
referenceIdList	O	
repositoryUniqueId	O	If present, tested for format
serviceStartTime	R2	Suggested range; see below
serviceStopTime	R2	Suggested range; see below
size	O	If present, tested for correct value.
sourcePatientId	R	Tested for format
sourcePatientInfo	O	Not tested
title	O	Not tested
typeCode	R	Depends on document type; see below
uniqueId	R	Generated by Initiating Gateway; tested for format
URI	O	Not tested

Any attribute below with the label Suggested Value will not be tested for those values. Use the suggested value or another of your choosing.

author suggested values: Lincoln^Miranda, Grant^Jonas

classCode: The value for classCode cannot be directly determined from the document type (CCD, Progress Note, etc.). You are constrained to use a value from the classCode Value Set. These are suggested mappings, but they will not be tested.

Document Type	Suggested classCode
CCD	SUMMARIES
Progress Note	REPORTS
Discharge Summary	SUMMARIES
PDF	Will depend on the content of the PDF

creationTime: Please use different values that are on or after 2000.01.01. That will demonstrate realistic values and that they are not hard coded in your system.

formatCode: The value for formatCode is deterministic. In the context of this testing program:

formatCode	Trigger Rules
urn:hl7-org:sdwg:ccda-structuredBody:2.1	Required for C-CDA 2.1 documents with a structured body. Examples include CCD, Progress Note, Discharge Summary.
urn:hl7-org:sdwg:ccda-nonXMLBody:2.1	Required for C-CDA 2.1 documents where the body is not structured. That is, the body is an embedded document in another format such as PDF.

homeCommunityId: The attribute DocumentEntry.homeCommunityId is optional when the Initiating Gateway sends a document. If the value is included, it must match the value that is provided in the simulated environment with one or more Responding Gateways, corresponding to one or more communities.

mimeType: The value for mimeType is deterministic. In the context of this testing program:

mimeType	Trigger Rules
text/xml	Required for all C-CDA 2.1 documents, including those with structured bodies and unstructured bodies (non XML).

objectType: When submitting a document in the Message Delivery Scenario, the required value for objectType indicates a stable Document Entry:

```
urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1
```

serviceStartTime: Similar to creationTIme, please use different values for different documents to demonstrate that your system is not hard coding values. There are no constraints on time range as you are documenting actual events/observations in patient history and not the time the document was created.

serviceStopTime: See comments for serviceStartTime. The value for serviceStopTime must be on or after the value for serviceStartTime.

typeCode: The value for typeCode depends on the document that is submitted and is not always deterministic. See the table below.

C-CDA 2.1 Document	Values / Notes
CCD	Fixed: 34133-9 (2.16.840.1.113883.6.1) This corresponds to the value of ClinicalDocument.code in the CCD.
Progress Note	Can be one of the following: 11506-3 (2.16.840.1.113883.6.1)
Discharge Summary	
Unstructured Document	Can be any value from the typeCode Value Set

7.2 Submission Set Metadata – Message Delivery

Metadata Attribute	Optionality (Initiating Gateway)	Testing Notes
author	R2	
availabilityStatus	O	
comments	O	
contentTypeCode	R	
entryUUID	R	
homeCommunityId	O	
intendedRecipient	R2	
limitedMetadata	X	
patientId	R	

Metadata Attribute	Optionality (Initiating Gateway)	Testing Notes
sourceId	R	
submissionTime	R	
title	O	
uniqueId	R	