April 2, 2014
Revision 1.6

USER GUIDE

NIST Transport Testing Tool (TTT)

National Institute of Standards and Technology

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1.0 OVERVIEW

1.1 Role of NIST

Since its foundation in 1901, the National Institute of Standards and Technology (NIST) has been devoted to promoting innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve human qualities of life. In support of this mission, NIST has strategically acknowledged the need for opportunity discovery within the private sector's range of vital industries and technology areas. Under the American Recovery and Reinvestment Act of 2009 (Recovery Act), NIST was called upon to consult the Office of the National Coordinator (ONC) in its mission to encourage greater adoption of interoperable health IT technologies and capabilities. To accomplish this mission, NIST is collaborating with ONC to develop a structured program that eligible professionals, hospitals, and critical access hospitals (CAHs) can achieve that demonstrates compliance with applicable Meaningful Use Stage 2 (MU2) [1] criteria and requirements. NIST's primary role is to assist ONC establish the necessary functional and conformance testing requirements, test cases, and testing tool sets need to successfully implement a voluntary health IT certification program.

1.2 Transport Testing Tool

NIST has developed a tool to test the transport and content-related standards expressed within the 2014 Edition of the ONC Standards & Certification Criteria [2]. The tool, commonly referred to within this document and accompanying resources as the Transport Testing Tool (TTT), tests for Direct (S/MIME), Simple Object Access Protocol (SOAP), and XDM for direct transport standards and Consolidated-Clinical Document Architecture (C-CDA) based content. The TTT provides an environment in which users can determine the level of conformance their populated C-CDA documents have weighed against the specifications within the C-CDA Implementation Guide for corresponding Document, Section, and Entry Templates. The TTT executes Mobile Driven Health Tools (MDHT) validation tests for C-CDA conformance. Validation results are rendered to users in XML format, from which identifications of non-C-CDA conformant segments can be determined. Non-conformant segments also trigger error and warning messages (user readable) within the Tool.

At a broad level of applicability and usage, ONC-Authorized Testing Laboratories (ATLs) and associated Certification Bodies (ONCATCBs) of electronic health record (EHR) providers can utilize the TTT to certify EHR module achievement against 2014 Edition Objectives of selected ONC Standards & Certification Criteria (e.g., ability to send and receive messages and C-CDA attachments). The methods by which messages should be sent and received are outlined further within this User Guide.

1.3 Purpose

The purpose of this User Guide is to outline the process by which users/EHR's (abstractly referred within this document and accompanying resources as "Systems Under Test") may send and receive messages and C-CDA attachments to the TTT for the purposes of transport and content testing, as required by ONC.

1.4 Access

The TTT can be accessed through two (2) interfaces: Web and Local.

- **Web Interface –** Accessible online through the following link: http://transport-testing.nist.gov. This web interface link is referred to within the User Guide and accompanying resources as the '*Home Page*'. The User Guide describes the 2014 Edition Testing processes for this online version only.
- **Local Interface –** Downloadable and executable file (.war) is available through the following link: http://sourceforge.net/projects/iheos/files/TransportTestingTool/. Installation instructions are available at: http://http://transport-testing.nist.gov/ttt/doc/install.html. Configuration instructions are available at: https://github.com/meaningfuluse/mu2/blob/master/transport/ttt-configuration.md.

***Current Version**: For each build, the current version, modification date, and associated release notes are available at: http://transport-testing.nist.gov/ttt/doc/release_notes.html.*

***Supported systems**: All current release/builds only support Linux-based Operating Systems. Windows is not supported for this release, but will be considered in future releases/builds.*

1.5 Security

DIRECT Testing

On the '*Home Page*' of the TTT, there are two (2) Trust Anchors and one (1) Public Certificate that must be downloaded and installed on the System Under Test (SUT) to enable the sending and receiving of Direct Messages.

- **Public Certificate**
  - The TTT's Public Certificate must be used to encrypt the message contents that the SUT send to the TTT and is available through the following link: http://transport-testing.nist.gov/ttt/pubcert/transport-testing.nist.gov.der.

***Note**: The Mime Body of the DIRECT Message must be encrypted with this self-signed Public Certificate.*

- **Trust Anchor**
  - Valid:
    - To ensure common trust among information exchange participant using Direct Messaging, Trust Anchors must be configured through the following link: http://transport-testing.nist.gov/ttt/pubcert/nist.gov.der.
  - Invalid:
    - The invalid Trust Anchor is ONLY used by the TTT to invalidate the trust relationship. When and only when instructed by the test procedures, download to the SUT through the following link: http://transport-testing.nist.gov/ttt/pubcert/invalid-trust-relationship.der.

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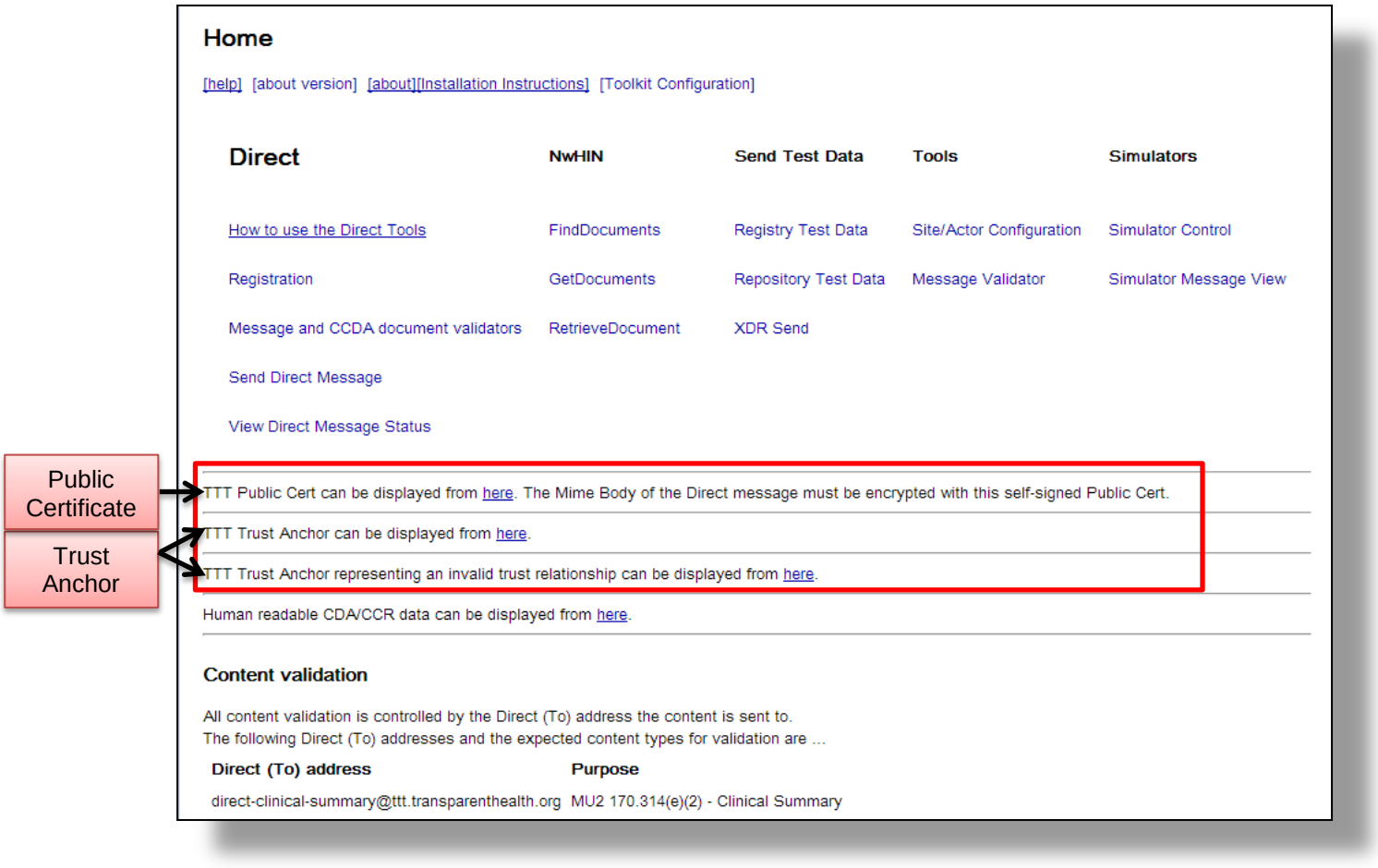
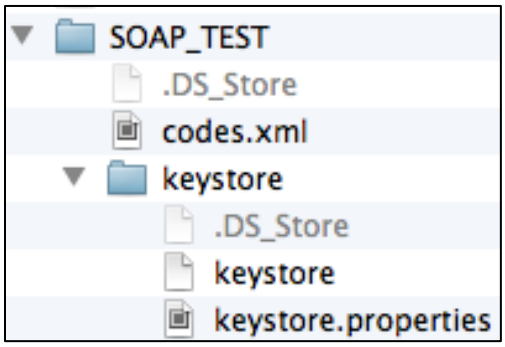
***Note**: DO NOT use the invalid Trust Anchor for any other process with the TTT.*



SOAP Exchange Testing
For MU2, it is a requirement that all messages should be exchanged over a Transport Layer Security (TLS) encryption protocol. To facilitate testing, the TTT often utilizes a unique self-signed certificate that is shared among all TTT actors. The TTT uses the concept of 'environment' to configure its sending functionality.

The canonical environment can be accessed and downloaded through the following link: http://sourceforge.net/projects/iheos/files/SOAP_TEST.zip/download. The 'environment', contained within the SOAP testing toolkit (.zip), has the following file structure:



Section 6.3 of this User Guide makes use of this 'environment'. Thus, throughout the content of this User Guide, assumptions are made that TTT deplorers are leveraging these baseline configurations. The Tomcat server instance hosting the TTT should also be configured to use 'SOAP_TEST' 'keystore' for TLS.

This connector decleration is as follows:

```
<Connector port="8443" protocol="HTTP/1.1" SSLEnabled="true"
           maxThreads="150" scheme="https" secure="true"
           clientAuth="false" sslProtocol="TLS"
           keystoreFile="${external_cache}/SOAP_TEST/keystore/keystore" keystorePass="changeit"
           truststoreFile="${external_cache}/SOAP_TEST/keystore/keystore" truststorePass="changeit"
            />
```

The private key stored in the 'keystore' should be extracted and used to configure the SUT's 'keystore' and 'truststore' as deemed appropriate.

1.6 Testing Overview

The TTT will allow users/EHRs to send and receive messages using various transport methods, dependent upon specific MU2 objectives. The identified objectives that have been selected and outlined for testing purposes are:

- **170.314(b)(1)** Transitions of Care (*Ambulatory*)
- **170.314(b)(1)** Transitions of Care (*Inpatient*)
- **170.314(b)(2)** Transitions of Care (*Ambulatory*)
- **170.314(b)(2)** Transitions of Care (*Inpatient*)
- **170.314(b)(7)** Data Portability (*Ambulatory*)

- **170.314(b)(7)** Data Portability (*Inpatient*)
- **170.314(e)(1)** View, Download, Transmit to 3rd Party (*Ambulatory*)
- **170.314(e)(1)** View, Download, Transmit to 3rd Party (*Inpatient*)
- **170.314(e)(2)** Clinical Summary

2.0 STRUCTURE

This User Guide is structured into the following sections/subsections:

1. **Registration:**
Before the sending or receiving of messages can occur, a user/EHR must take the prerequisite step of registering an address(es) and contact information with the TTT. This step is requirement and must be satisfied prior to exchanging critical information (e.g., contact e-mail addresses, direct addresses, certificates, and SOAP endpoint information) between the SUT and the TTT.

2. **Sending Messages:**
There are **required** and **optional** methods by which users/EHRs can test their ability to send messages with C-CDA attachments to the TTT. These methods are outlined below:

MU2 Objective		DIRECT		SOAP
		S/MIME	XDM Attachment Messages	C-CDA Attachments
170.314(b)(1)	Transitions of Care (*Ambulatory*)			
	Transitions of Care (*Inpatient*)			
170.314(b)(2)	Transitions of Care (*Ambulatory*)			
	Transitions of Care (*Inpatient*)			
170.314(b)(7)	Data Portability (*Ambulatory*)			
	Data Portability (*Inpatient*)			
170.314(e)(1)	View, Download, Transmit to 3rd Party (*Ambulatory*)			
	View, Download, Transmit to 3rd Party (*Inpatient*)			
170.314(e)(2)	Clinical Summary			

Required ■ Optional ■

Table 1: Sending Messages Testability

- **DIRECT with S/MIME** (**Required** for MU2 certification)
  - 170.314(e)(1) View, Download, Transmit to 3rd Party (*Ambulatory*)
  - 170.314(e)(1) View, Download, Transmit to 3rd Party (*Inpatient*)
  - 170.314(b)(2) Transitions of Care (*Ambulatory*)

- 170.314(b)(2) Transitions of Care (*Inpatient*)

- **DIRECT with XDM Attachment Messages** (**Optional** for MU2 certification)
  - 170.314(b)(2) Transitions of Care (*Ambulatory*)
  - 170.314(b)(2) Transitions of Care (*Inpatient*)

- **SOAP with C-CDA Attachments** (**Optional** for MU2 certification)
  - 170.314(b)(2) Transitions of Care (*Ambulatory*)
  - 170.314(b)(2) Transitions of Care (*Inpatient*)

3. Receiving Messages:

There are **required** and **optional** methods via which users/EHRs can test their ability to receive messages with C-CDA/ Continuity of Care Record (CCR)/C32 attachments from the TTT. These methods are outlined below:

		DIRECT						SOAP		
		S/MIME			XDM Attachment Messages					
MU2 Objective		CCR	C-CDA	C32	CCR *S/MIMI XDM*	C-CDA *S/MIMI XDM*	C32 *S/MIMI XDM*	CCR	C-CDA	C32
170.314(b)(1)	Transitions of Care (*Ambulatory*)									
	Transitions of Care (*Inpatient*)									
170.314(b)(2)	Transitions of Care (*Ambulatory*)									
	Transitions of Care (*Inpatient*)									
170.314(b)(7)	Data Portability (*Ambulatory*)									
	Data Portability (*Inpatient*)									
170.314(e)(1)	View, Download, Transmit to 3rd Party (*Ambulatory*)									
	View, Download, Transmit to 3rd Party (*Inpatient*)									
170.314(e)(2)	Clinical Summary									

Required ■ Optional ■

Table 2: Receiving Messages Testability

- **DIRECT with S/MIME** (**Required** for MU2 certification)
  - CCR via S/MIME (**Required** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
  - C-CDA via S/MIME (**Required** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
  - C32 via S/MIME (**Required** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
- **DIRECT with XDM Attachment Messages** (**Optional** for MU2 certification)
  - CCR via S/MIME XDM (**Optional** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
  - C-CDA via S/MIME XDM (**Optional** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
  - C32 via S/MIME XDM (**Optional** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
- **SOAP** (**Optional** for MU2 certification)
  - CCR via SOAP (**Optional** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
  - C-CDA via SOAP (**Optional** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)
  - C32 via SOAP (**Optional** for MU2 certification)
    - 170.314(b)(1) Transitions of Care (*Ambulatory*)
    - 170.314(b)(1) Transitions of Care (*Inpatient*)

4. Manual Validation:

There is another **optional** method via which users/EHRs can validate their C-CDA's with the TTT to debug and ensure conformant structure. This capability can be used to validate the contents for the following MU2 objectives:

- **170.314(b)(1)** Transitions of Care (*Ambulatory*)
- **170.314(b)(1)** Transitions of Care (*Inpatient*)

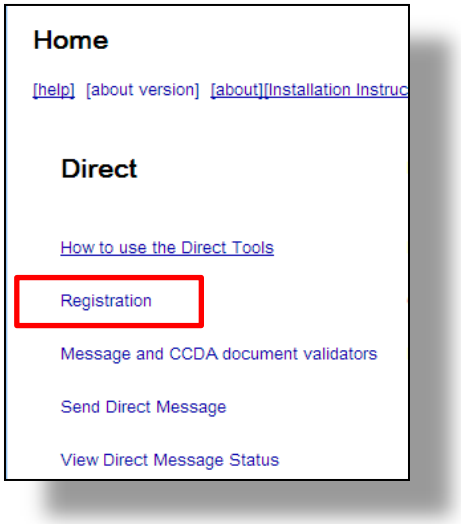
- **170.314(b)(2)** Transitions of Care (*Ambulatory*)
- **170.314(b)(2)** Transitions of Care (*Inpatient*)
- **170.314(b)(7)** Data Portability (*Ambulatory*)
- **170.314(b)(7)** Data Portability (*Inpatient*)**170.314(e)(1)** View, Download and Transmit to 3rd Party (*Ambulatory*)
- **170.314(e)(1)** View, Download and Transmit to 3rd Party (*Inpatient*)
- **170.314(e)(2)** Clinical Summary
- **Non-specific C-CDA**

3.0 REGISTRATION

Registration is a required action within the TTT environment and serves as an integral element by which the functionality to send and/or receive DIRECT or DIRECT/XDM messages is enabled.

3.1 Registering a DIRECT Web Address

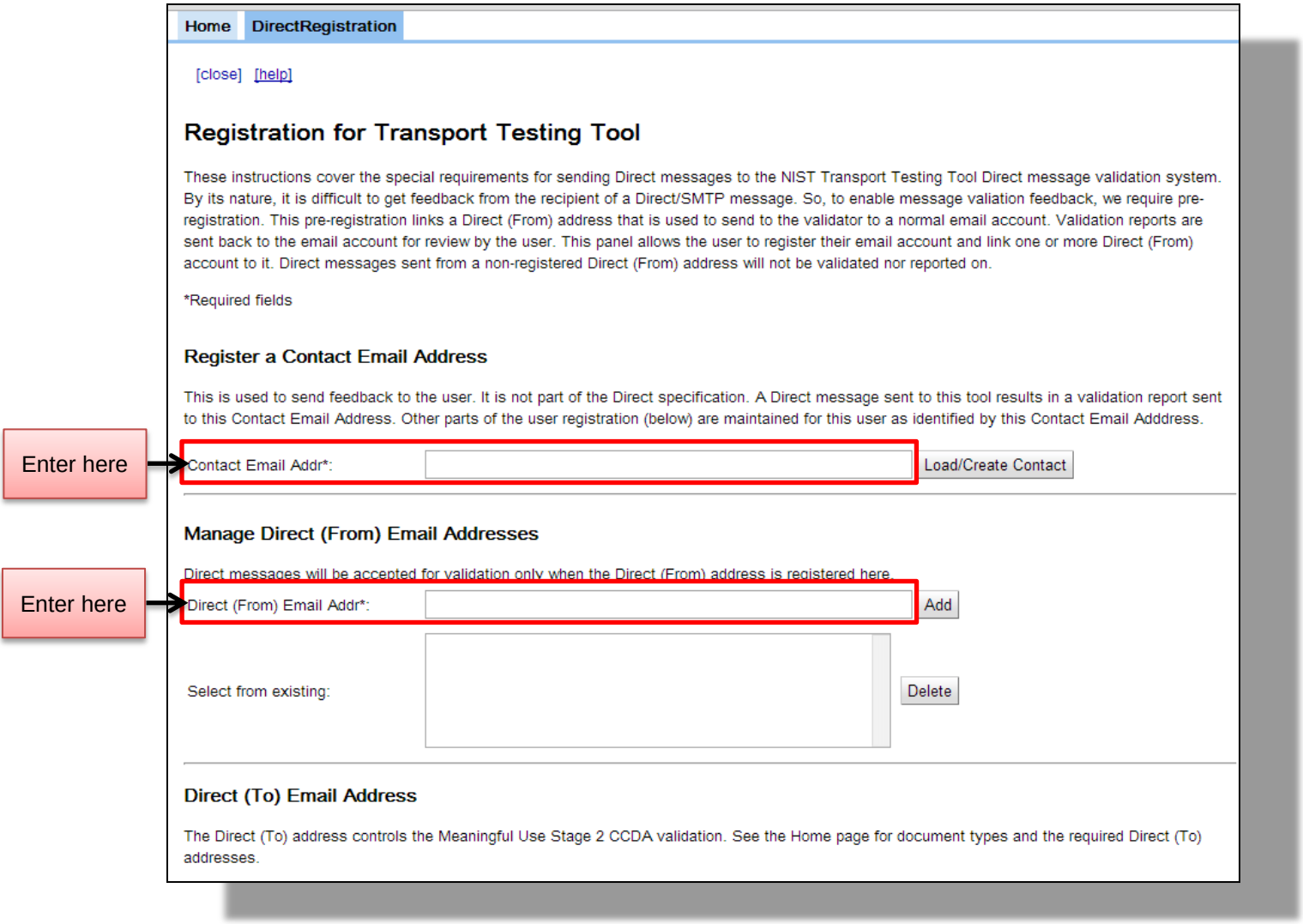
To register a DIRECT web address within the TTT environment, users must navigate to the '*Home Page*' and click on "*Registration*" under the '*Direct*' column.



***Note**: Users who do not register their DIRECT web address will not be recognized by the TTT and therefore be unable to send or received DIRECT OR DIRECT/XDM messages.*

On the '*Direct Registration'* tab, users will be asked to provide the following information:

- Contact Email Address (e.g., personal email address); and
- Direct Email Address.



Registration Steps:

1. Provide a contact email address. This address will be used to email all validation reports.
2. Provide a 'from' email address. This address will be registered in the TTT. Any valid content from this address will be validated and the corresponding validation report emailed to the contact address.

Once users have registered, they will be placed on a "white list" of approved email addresses from which the TTT will accept messages.

***Note**: Users not who do not register their contact and DIRECT email addresses will not be recognized by the TTT and therefore not be able to send and/or receive messages.*

After user registration is complete and email addresses are successfully created/added, navigate back to the '*Home Page*' tab.

Once complete, refer to Section 4.0 of this User Guide.

3.2 Registering a DIRECT Email Address

Users utilizing the SOAP/SAML send and receive features of the TTT do not need to pre-register in the '*Registration*' tab/section. However, users will need to register their endpoints used to access the TTT. This will be completed at the time of message sending and/or receiving.

Since the interaction is interactive, the validation results are displayed on the users screen, so there is no need to register a contact email address.

3.3 Diagram for Send/Receive by MU2 Objective

Upon successful completion of the user registration process, the TTT will allow users/EHR's to send and receive messages by several MU2 objective dependent methods. The figure below is a visual depiction of the process that will be explained in the subsequent sections. Green lines indicate mandatory DIRECT protocol send and receives, purple indicate DIRECT + XDM protocol send and receives, and blue indicate SOAP/SAML protocol send and receives.

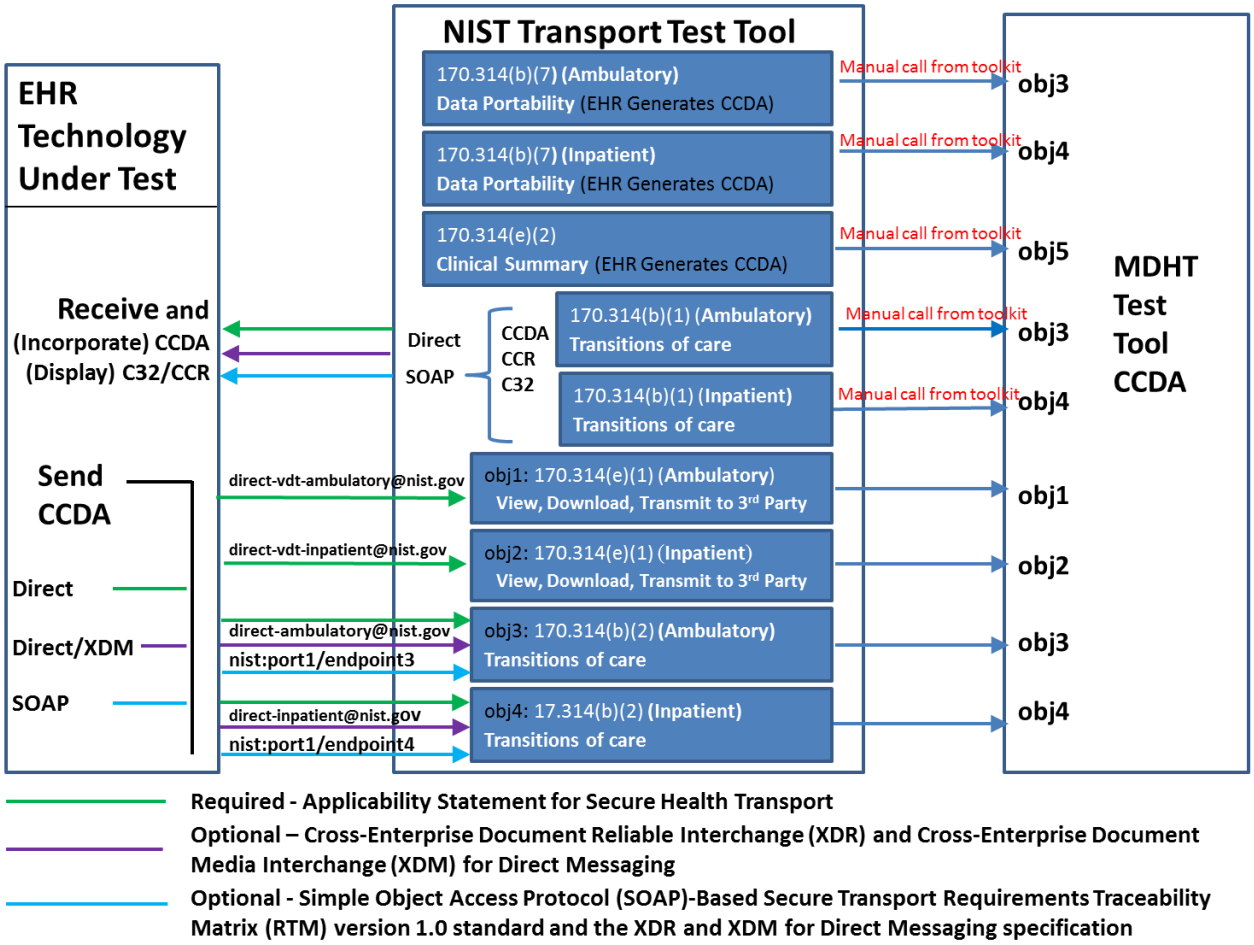


Figure 4: Email Registration

4.0 SENDING C-CDA MESSAGES TO THE TRANSPORT TESTING TOOL

4.1 Send a DIRECT Message to the TTT

Sending messages via DIRECT is the **required** mechanism for MU2 certification outlined by the objectives contained within ONC's Standards & Certification Criteria 2014 Edition.

The MU2 objectives against which a user can test his/her system, currently supported by the TTT, are listed in the table below:

***Note**: MU objectives with the same DIRECT email address (in the table below) use the same validation service in the MDHT validator (i.e., the C-CDA is the same). They are represented in the here to provide clarity to for address and MU2 objective mappability.*

Direct (To) Address	Purpose
direct-clinical-summary@<host-address>	MU2 170.314(e)(2) - Clinical Summary
direct-ambulatory@<host-address>	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Ambulatory Care
direct-ambulatory@<host-address>	MU2 170.314(b)(7) Data Portability - For Ambulatory Care
direct-ambulatory@<host-address>	MU 2 170.314(b)(1) Transition of Care Receive – For Ambulatory Care
direct-inpatient@<host-address>	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Inpatient Care
direct-inpatient@<host-address>	MU2 170.314(b)(7) Data Portability - For Inpatient Care
direct-inpatient@<host-address>	MU 2 170.314(b)(1) Transition of Care Receive – For Inpatient Care
direct-vdt-ambulatory@<host-address>	MU2 170.314 (e)(1) Ambulatory Summary
direct-vdt-inpatient@<host-address>	MU2 170.314 (e)(1) Inpatient Summary
direct-vdt-inpatient-toc@<host-address>	MU2 170.314 (e)(1) Inpatient Summary- TOC
C-CDA@<host-address>	Non-specific C-CDA
direct-clinical-summary@<host-address>	MU2 170.314(e)(2) - Clinical Summary
direct-ambulatory@<host-address>	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Ambulatory Care

Table 3: DIRECT Address to MU2 Objective

The prerequisite to sending messages to the TTT via DIRECT is registering a DIRECT email address. To register a DIRECT email address, refer to Section 3.1 of this User Guide.

4.2 Sending Steps

1. The Sender will include the Public Key signing certificate (refer to Section 1.5 of this User Guide). in messages sent to the TTT. Once registered with the TTT, the user selects the MU2 objective that is representative and appropriate for the content they are sending (e.g., C-CDA or human readable text). The sending content will automatically be validated and a report sent to the contact email address entered when during registration.
2. Based on the MU2 objective the user is testing against, select the DIRECT email addresses to send the content (reference the *Table 3: DIRECT Address to MU2 Objective* in Section 4.1 of this User Guide).
3. The validation report will be sent to the email address created/added during registration.

***Note**: <host-address> is set to the address of the user endpoint (i.e., local machine) the TTT is in operation on.*

***Note**: Each email address can also accept text/plain MIME formats to assist in validating human-readable text.*

4.3 Send a DIRECT + XDM Message to the TTT

Sending messages via DIRECT + XDM is an **optional** mechanism for MU2 certification outlined by the objectives contained within ONC's Standards & Certification Criteria 2014 Edition. The DIRECT + XDM mechanism is referenced in MU for sending CDA instances as XDM .zip archives attached to DIRECT messages.

Within the TTT, here are two MU objectives for which a user can send messages via Direct + XDM:

- **170.314(b)(2)** Transitions of Care (*Ambulatory*)
- **170.314(b)(2)** Transitions of Care (*Inpatient*)

Direct (To) Address	Purpose
direct-ambulatory-xdm@<host-address>	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Ambulatory Care
direct-inpatient-xdm@<host-address>	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Inpatient Care

Table 4: DIRECT + XDM Message Sending

***Note**: <host-address> is set to the address of the user endpoint (i.e., local machine) the TTT is in operation on.*

The prerequisite to sending messages to the TTT via DIRECT + XDM is registering a DIRECT email address. To register a DIRECT email address, refer to Section 3.1 of this User Guide.

Once registered with the TTT, the user selects the MU2 objective that is representative and appropriate for the content they are sending (e.g., C-CDA or human readable text). The sending content will automatically be validated and a report sent to the contact email address entered when during registration.

1. Based on the MU2 objective the user is testing against, select the DIRECT email addresses to send the content (reference the *Table 3: DIRECT Address to MU2 Objective* in Section 4.1 of this User Guide).

Direct (To) Address	Purpose
direct-ambulatory-xdm@<host-address>	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Ambulatory Care
direct-inpatient-xdm@<host-address>	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Inpatient Care

Table 4: DIRECT + XDM Message Sending

2. The validation report will be sent to the email address created/added during registration.

***Note**: <host-address> is set to the address of the user endpoint (i.e., local machine) the TTT is in operation on.*

***Note**: Each email address can also accept text/plain MIME formats to assist in validating human-readable text.*

4.4 Send a SOAP Message to the TTT

Sending messages via SOAP is an optional mechanism for MU2 certification outlined by the objectives contained within ONC's Standards & Certification Criteria 2014 Edition. Unlike the previous mechanisms, DIRECT and DIRECT + XDM, SOAP allows a user to make a remote function call over the Internet using the same process one would for a normal Web address.

There are two MU2 Objectives for which a user can send messages via SOAP:

- **170.314(b)(2)** Transitions of Care (*Ambulatory*)
- **170.314(b)(2)** Transitions of Care (*Inpatient*)

SOAP Endpoint Address	Purpose
nist:port1/endpoint3	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Ambulatory Care
nist:port1/endpoint4	MU2 170.314(b)(2) Transition of Care/Referral Summary - For Inpatient Care

Table 5: SOAP Message Sending

***Note**: The endpoints above are sample only. The actual endpoints are generated by the TTT.*

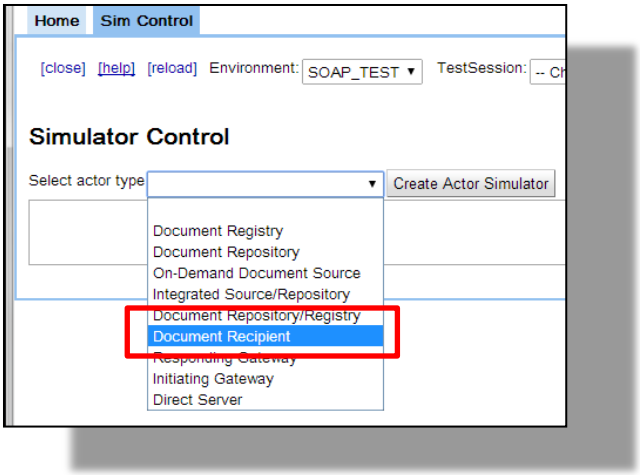
4.5 Send a C-CDA using SOAP/SAML

To send a C-CDA to the TTT using SOAP/SAML, the user must generate the SOAP endpoints to be utilized within the TTT by:

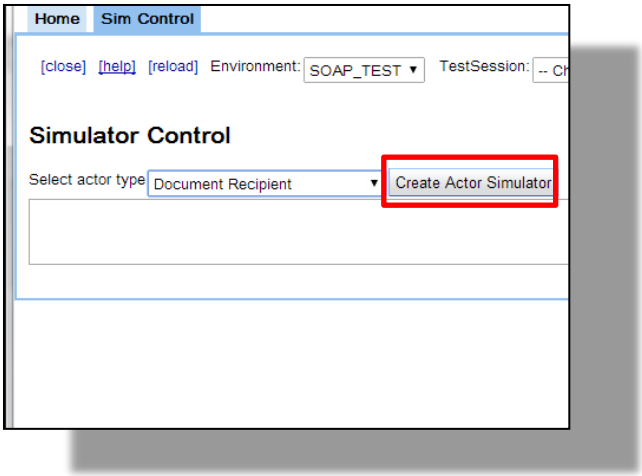
Defining an Actor Simulator:

1. On the '*Home Page*', select the '*Simulator Control'* in the '*Simulators*' column.

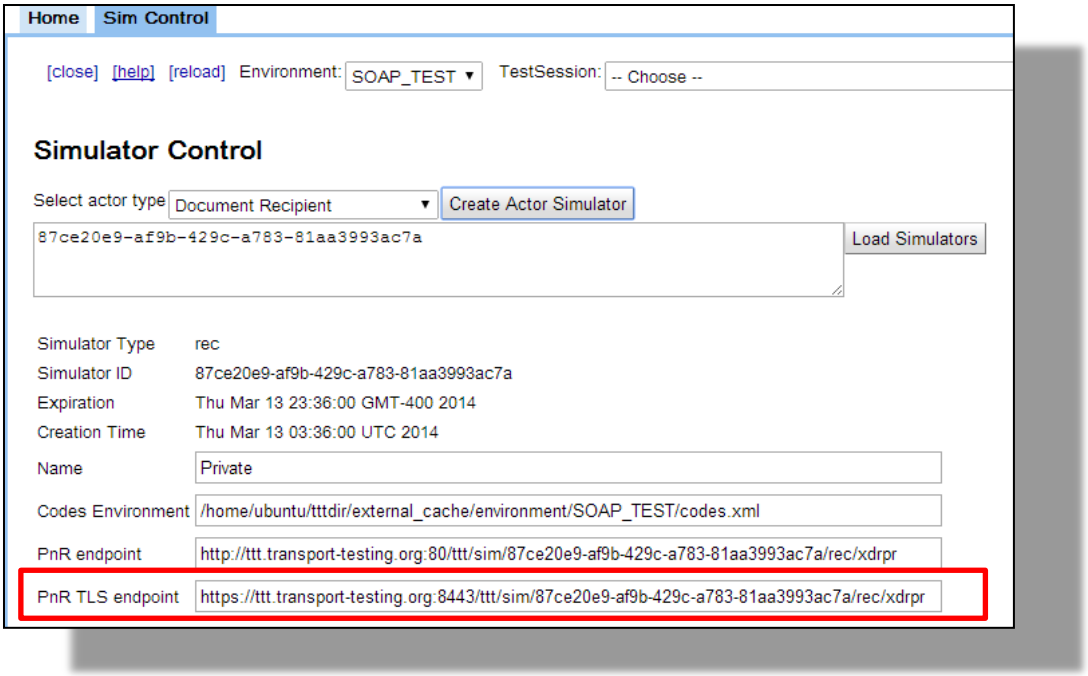
2. Select '*Document Recipient*' from the '*Select Actor Type'* pull-down menu.



3. Click "*Create Actor Simulator*".

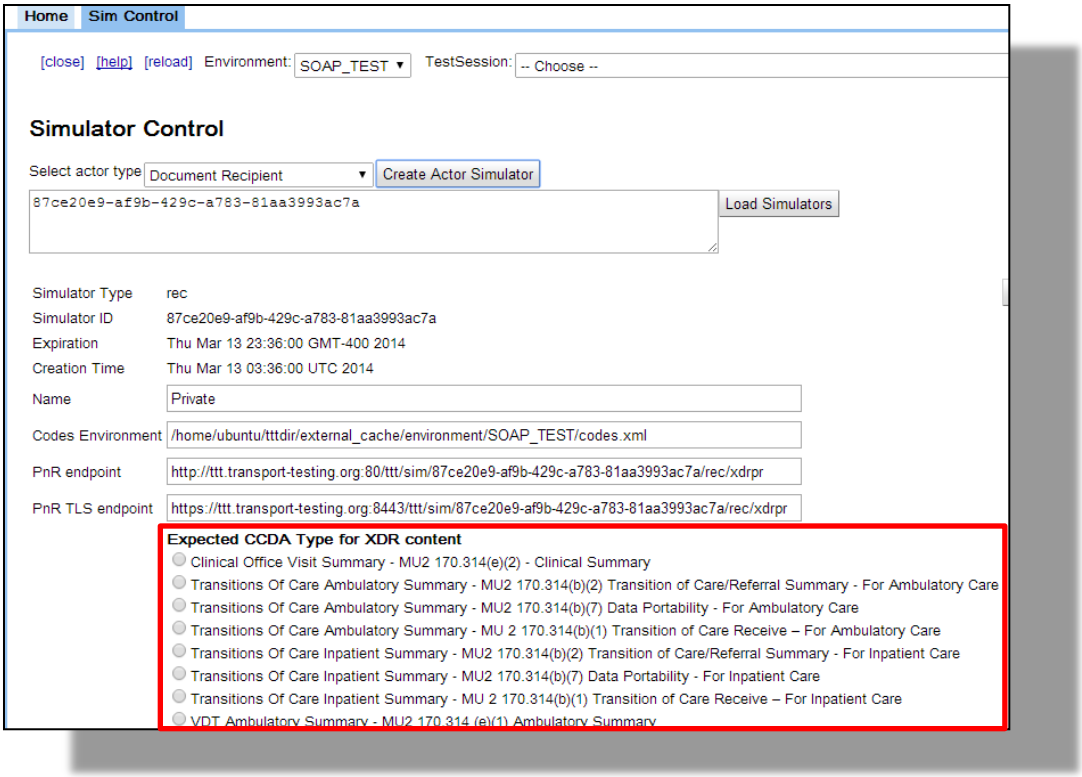


4. Copy the end point displayed in '*PnR TLS endpoint*'. This is a TLS endpoint.

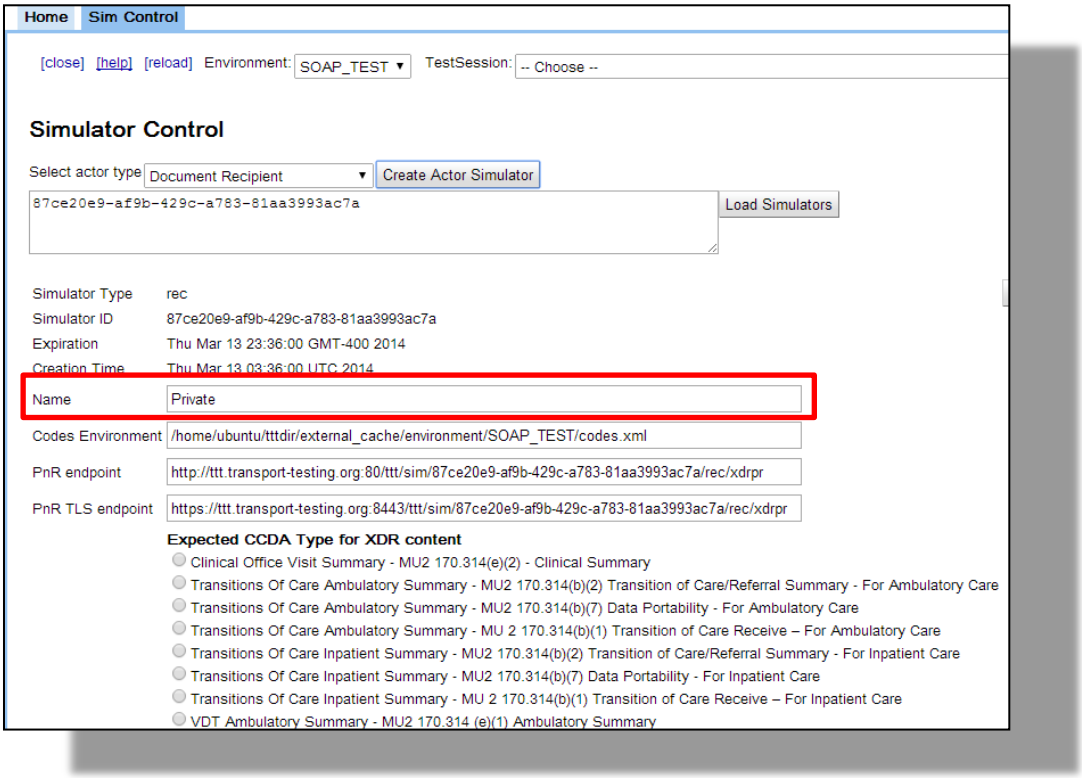


***Note**: Do not use the PnR endpoint above it, as this is non-TLS.*

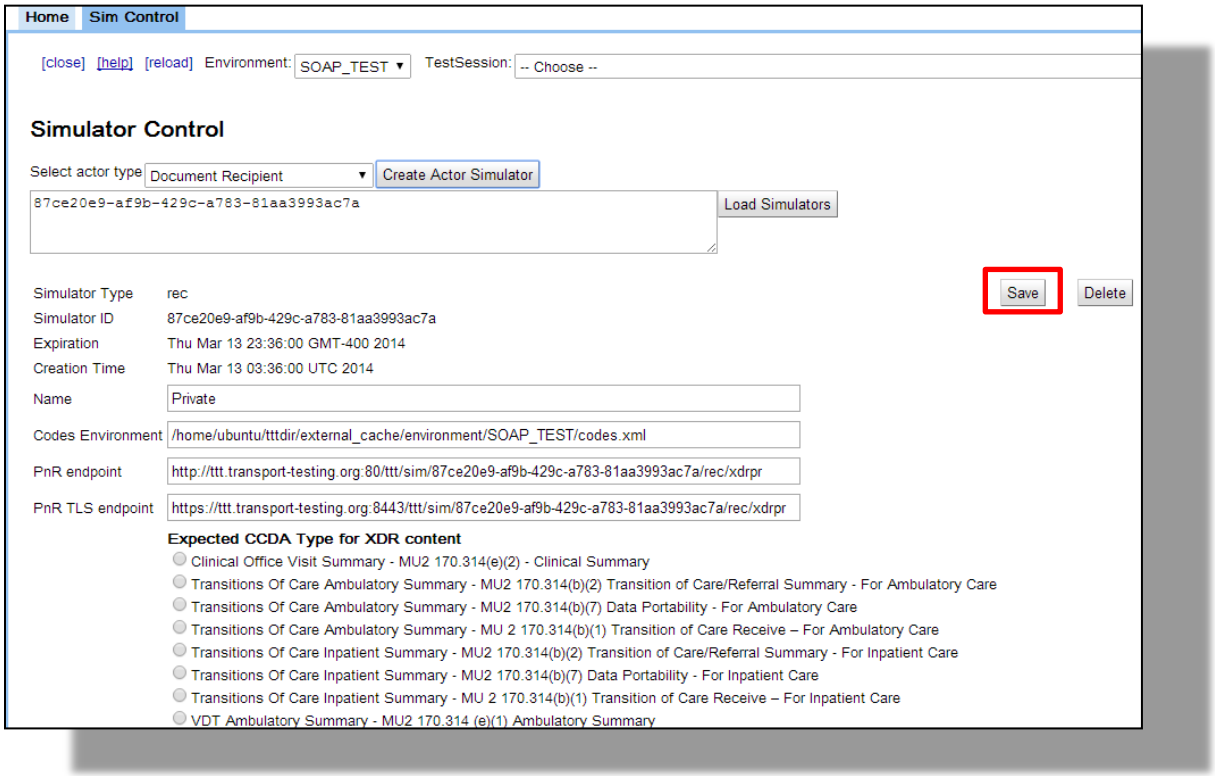
5. Select the '*Expected C-CDA Type for XDR content'* from the list that will be sent to the TTT. This action will allow the C-CDA to be sent to the appropriate Validator. This endpoint will always be associated with this type C-CDA. An individual endpoint will be created for each C-CDA that is sent.



6. Provide this connection a name and enter it into the '*Name*' field. This connection name will be referenced in subsequent menus.



7. Click '*Save'*. This action will create a new simulator under the name previously entered. Multiple connections may be created. Provide each created connection a unique name to aid in subsequent TTT menus references.



8. Exit the '*Sim Control'* menu and navigate to the '*Home Page*'.

Send the Message to the TTT:

a. On the user operated System Under Test (SUT; device/endpoint used to interact with the TTT), send the message to the TTT.
b. Upon successful sending of the message, click on '*Simulator Message View*' under the simulators to view the output from the validation from TTT. Select '*Simulator*' from the pull-down menu and locate the named connection from a previous step. If multiple connections have been created, each one will be named individually. They can be accessed from the menu.
c. A display will be present that depicts the complete of messages exchanged. By clicking on a message, a user can view a display with the associated request/response messages. The response will contain the list of validation errors and/or warnings detected by the TTT. The bottom portion of the request/response message contains a log that a user can inspect for further insight into the tests performed.

5.0 SENDING MESSAGES FROM THE TRANSPORT TESTING TOOL TO A SYSTEM UNDER TEST

As outlined in the Section 1.6 of this User Guide Testing Overview and per ONC's Standards & Certification Criteria 2014 Edition MU2 objectives, there are three (3) different mechanisms via which users can receive messages with CCR, C-CDA, or C32 attachments from the TTT:

	DIRECT						SOAP		
	S/MIME			XDM Attachment Messages					
	CCR	C-CDA	C32	CCR *S/MIMI XDM*	C-CDA *S/MIMI XDM*	C32 *S/MIMI XDM*	CCR	C-CDA	C32
Requirement									
Optional									

Required ■ Optional ■

Table 6: TTT Message Receiving

- **Direct with S/MIME** (**Required**)
  - CCR via S/MIME (**Required** by MU2)
  - C-CDA via S/MIME (**Required** by MU2)
  - C32 via S/MIME (**Required** by MU2)

- **Direct with XDM Attachment Messages** (**Optional**)
  a. CCR via S/MIME XDM (**Optional**)
  b. C-CDA via S/MIME XDM (**Optional**)
  c. C32 via S/MIME XDM (**Optional**)

- **Simple Object Access Protocol (SOAP)** (**Optional**)
  - CCR via SOAP (**Optional**)
  - C-CDA via SOAP (**Optional**)
  - C32 via SOAP(**Optional**)

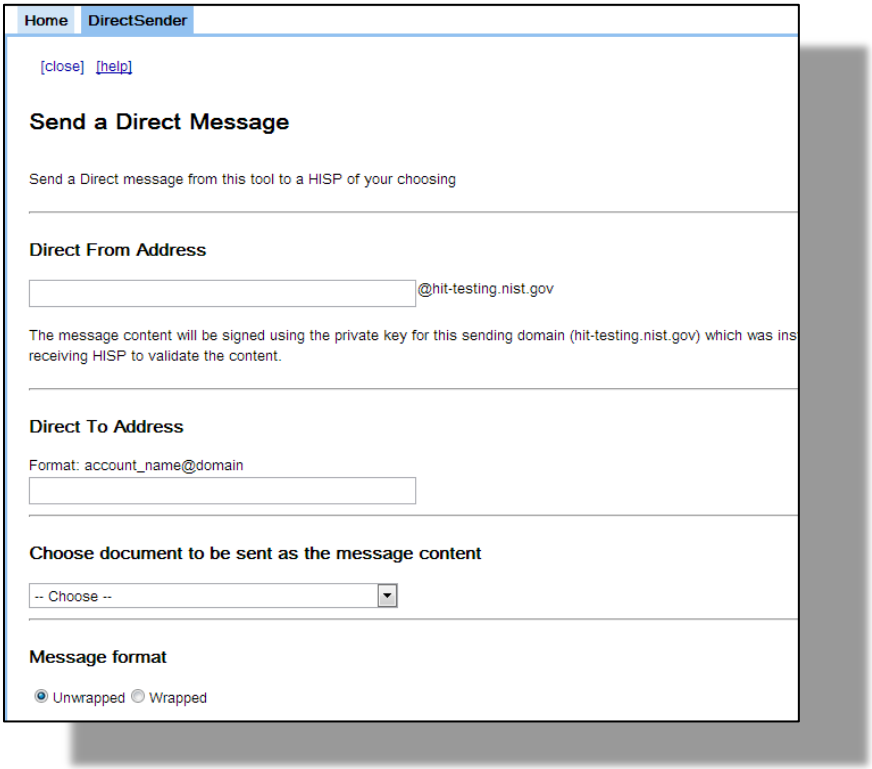
For each of the three (3) mechanisms, there are two (2) MU2 Objectives for which users can receive C-CDA, CCR, and/or C32 files:

- **170.314(b)(1)** Transitions of Care (*Ambulatory*)
- **170.314(b)(1)** Transitions of Care (*Inpatient*)

5.1 Send a DIRECT Message to a System Under Test

A user may receive CCR, CDA, and/or C32 files from the TTT via DIRECT messages**.** The process to receive DIRECT messages is outlined below.

1. From the '*Home Page*' tab, click '*Send Direct Message*' link from the '*Direct*' column.



2. Send a DIRECT message with the attached C-CDA document to an authorized email addresses corresponding to the MU2 objective under test (reference *Table 3: DIRECT Address to MU2 Objective* in Section 4.1 of this User Guide).
3. Data input into the '*Direct From Address*' field must align with address the SUT is expecting to receive email from. The MDN will be sent back to TTT using this address and the associated name will appear in the from field of the message sent.
4. In the '*Direct To Address*' field, input the DIRECT address where the message will be sent. This field will only accept one (1) email address, not multiple.
5. Select from one (1) of the six (6) samples within the pull-down menu. There are two (2) C-CCDA, two (2) CCR and two (2) C32 samples to select from.

> ***Note**: There is an XDM version for each of the samples. Do not select samples ending with _in_XDM.*

6. Select a message format of '*Wrapped*' or "*Unwrapped*". These actions will either wrap (or not) a message according to RFC 5751.

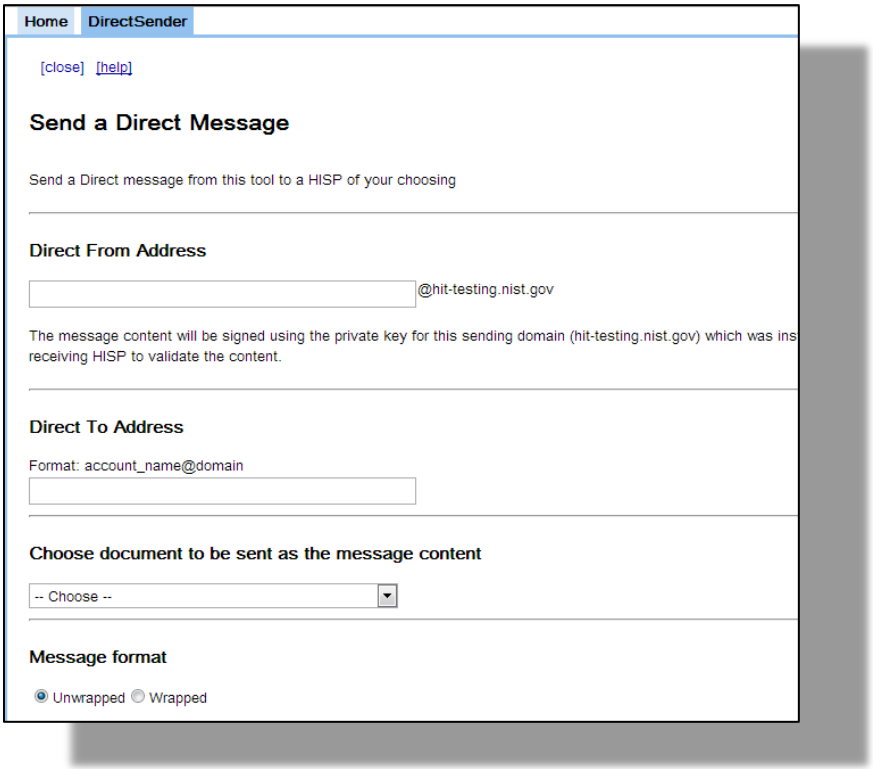
***Note**: All applications must support 'Unwrapped'. 'Wrapped is optional.*

7. Click the '*Browse*' button and upload the certificate to be used for encrypting the sent message (Public Key).
8. Click '*Submit*' to send the DIRECT message.
9. Verify the MDN was received using the instruction within Section 6.0 in this User Guide.

5.2 Send a DIRECT + XDM Message to a System Under Test

A user may receive CCR, C-CDA, and/or C32 attachments from the TTT via Direct + XDM. The process to receive Direct + XDM messages is outlined below.

1. From the '*Home Page*' tab, click '*Send Direct Message'* link from the '*Direct*' column.



2. Send a DIRECT message with the attached C-CDA document to an authorized email addresses corresponding to the MU2 objective under test (reference *Table 3: DIRECT Address to MU2 Objective* in Section 4.1 of this User Guide).

3. In the '*Direct From Address*' field, this must be the address the SUT is expecting to receive mail from. The MDN will be sent back to TTT using this address and this name will appear in the message sent in the from field.

4. Data input into the '*Direct From Address*' field must align with address the SUT is expecting to receive email from. The MDN will be sent back to TTT using this address and the associated name will appear in the from field of the message sent.
5. In the '*Direct To Address*' field, input the DIRECT address where the message will be sent. This field will only accept one (1) email address, not multiple.
6. Select from one (1) of the six (6) samples within the pull-down menu. There are two (2) C-CCDA, two (2) CCR and two (2) C32 samples to select from.

***Note**: Select samples ending with _in_XDM.*

7. Select a message format of '*Wrapped*' or "*Unwrapped*". These actions will either wrap (or not) a message according to RFC 5751.

***Note**: All applications must support 'Unwrapped'. 'Wrapped is optional.*

8. Click the '*Browse*' button and upload the certificate to be used for encrypting the sent message (Public Key).
9. Click '*Submit*' to send the DIRECT message.
10. Verify the MDN was received using the instruction within Section 6.0 in this User Guide.

5.3 Send a SOAP message to a System Under Test

A user may receive CCR, C-CDA, and/or C32 attachments from the TTT via SOAP. The TTT will call the user's SOAP service endpoint using the IHE XDR transaction and provide a CCR, C-CDA, and/or C32 document (selectable within the TTT).

The process by which to receive SOAP messages is outlined below.

The SOAP message is generated and sent to the SUT.

Define an Actor in the TTT terminology:

a) From the '*Home Page*' tab, select the '*Site/Actor Configuration'* link from the '*Tools*' column.
b) Through the menu, click the *'+'* button to add a new Actor.

***Note**: Do no enter information in the 'non-TLS Endpoints' column. This is the second (2nd) column. Non-TLS is not supported in MU2 (2014).*

c) Input data to complete the form provided. The mandatory fields are as follows:
   - Site Name: The SUT representative name (appearing in subsequent menus within the TTT as a selectable item).

- In the '*Document Recipient'* section , within the '*XDR Provide and Register'* column, input data for the endpoint used by the SUT to receive this XDR message.

d) Select the *'Save Changes'* button. This action is password protected. Please type the administrative password when prompted by the TTT to validate changes (the administrative password is from the installation).
e) Select the '*Save Changes'* button. This action is password protected. Please type the administrative password when prompted by the TTT to validate changes (the administrative password occurs during the TTT installation process).
f) Click the *'Close'* button and return to the '*Home Page*' tab.

To have the TTT send a SOAP message:

a) From the '*Home Page*' tab, select the '*XDR send'* link from the '*Send Test Data*' column.
b) Within the '*Environment*' drop down list, select the '*SOAP_TEST*' environment option.
c) Input data to provide a valid '*patient ID*' that corresponds to an accurate patient record that exists within the SUT that will receive the C-CDA.
d) Select a '*Test Data Set*' that corresponds with the documents being sent. This will be one (1) of the two (2) C-CCDA, CCR and/or C32 samples available. Only select documents labeled with '*full_metadata*', as these are the only NHIN specification compliant documents.
e) Select "*NHIN SAML***"** in the '*SAML*' menu.
f) Check the '*TLS*' checkbox.
g) Select the Actor defined in the previous step within the '*Document Recipient*' checklist.
h) Select the '*Run*' button.
i) Click on '*Inspect Results*' to view the SUT response.

6.0 VALIDATING RECIEPT OF AN MDN

Users can verify receipt of an MDN by the TTT using one (1) of the following methods:

MDN verification through receipt of a validation report:

a) When the TTT receives an MDN, it will validate the MDN message and send a Validation Report to the contact address registered with the DIRECT email address.

Verify the MDN via the DIRECT Message Status table:

a) When sending the message from the TTT, input a unique test session name for each message.
b) Click on the "*View Direct Message Status*" and verify that the test session name input in the previous step appears in the table. Also, verify that the time stamp of the MDN received corresponds to the message ID and time stamp of the message sent from the TTT.
c) Check the status of the message to verify the MDN was valid. If no MDN appears in the table, this indicates that no MDN was received. The DIRECT standard does not specify a time period within which receivers must send an MDN. Users must exercise their best judgment to determine that a lack of MDN in the '*DIRECT Message Status'* table indicates that no MDN was sent.

7.0 SENDING INVALID SIGNING CERTIFICATES AND SENDING WITH AN INVALID TRUST ANCHOR

To test the trust relationships between the TTT and SUT, the TTT has the ability to send DIRECT messages signed by a private certificate that is not valid. The following options are available on the DIRECT Send to test trust relationship capabilities:

GOOD_CERT	Is the valid certificate to be used (by default) for messages transmitted successfully.
INVALID_CERT	Is a certificate that has invalid fields and should be rejected by the receiving SUT.
EXPIRED_CERT	Is a certificate whose valid dates are not current
CERT_FROM_DIFFERENT_TRUST_ANCHOR	Is a valid certificate that was created from a trust anchor other than the one used by the TTT and should be rejected by the receiving SUT because it is not a child of the current trust anchor.

1. Choose one of the above certificates and send any of the C-CDA sample files available on the TTT to the SUT. Verify that the message was rejected using the system logs of the SUT.
2. Click on the '*View Direct Message Status*' and verify that no MDNs were received for any messages transmitted with certificates that are not valid (INVALID_CERT, EXPIRED_CERT, and CERT_FROM_DIFFERENT_TRUST_ANCHOR).
3. Test the rejection of a C-CDA conformant document with an invalid trust relationship:
    a) Download the trust anchor with the invalid trust relationship from the TTT '*Home Page*' and install it on the SUT.
    b) Send using the GOOD_CERT certificate and verify that the message was rejected by the SUT.

***Note**: Remember to reinstall the valid trust anchor in the SUT prior to the completion of testing activities.*

8.0 MANUALLY VALIDATING C-CDASENDING INVALID SIGNING CERTIFICATES AND SENDING WITH AN INVALID TRUST ANCHOR

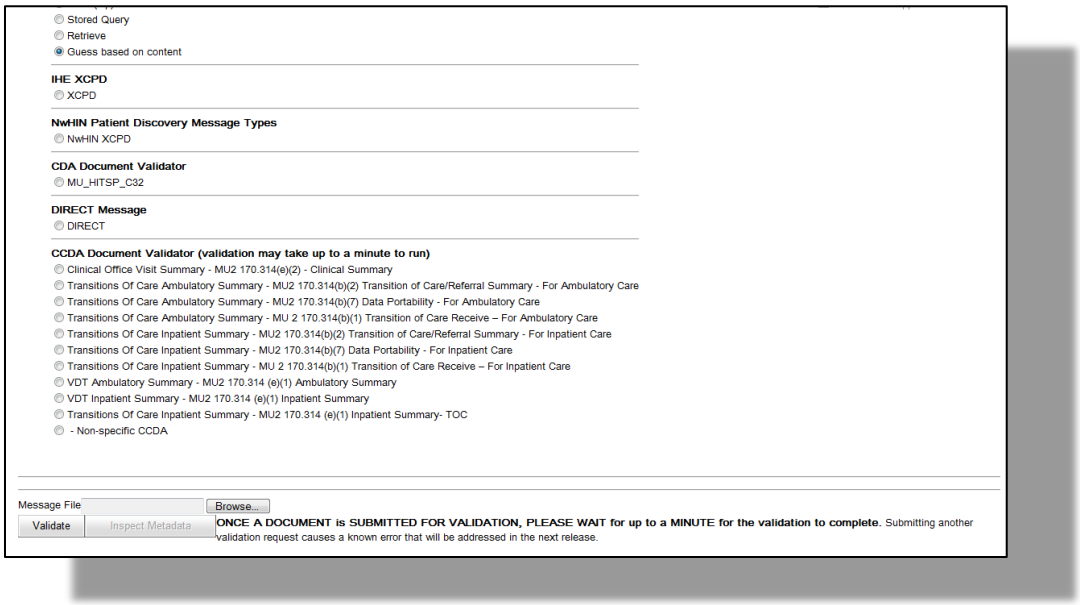
As outlined in the Testing Overview and per ONC's Standards & Certification Criteria 2014 Edition MU2 objectives, Manual Upload is an **optional** mechanism for validating C-CDA.

There are five (5) objectives for which a user may manually validate C-CDA:

- **170.314(b)(1)** Transitions of Care (*Ambulatory*)
- **170.314(b)(1)** Transitions of Care (*Inpatient*)
- **170.314(b)(7)** Data Portability (*Ambulatory*)
- **170.314(b)(7)** Data Portability (*Inpatient*)
- **170.314(e)(2)** Clinical Summary

1. To manually upload and validate a C-CDA with the TTT, visit the '*Home Page*' and click on '*Message and C-CDA document validators*'.

> ***Note**: Users do not need to register with the TTT to manually validate C-CDAs.*



2. Under the '*C-CDA Document Validator*' field, select the MU2 objective corresponding to the file containing the XML representation of the C-CDA that requires validation. There are nine (9) MU2 objectives and one (1) non-specific C-CDA for which a user may manually validate C-CDA:

   - **170.314(b)(1)** Transitions of Care (*Ambulatory*)
   - **170.314(b)(1)** Transitions of Care (*Inpatient*)
   - **170.314(b)(2)** Transitions of Care (*Ambulatory*)
   - **170.314(b)(2)** Transitions of Care (*Inpatient*)
   - **170.314(b)(7)** Data Portability (*Ambulatory*)
   - **170.314(b)(7)** Data Portability (*Inpatient*)
   - **170.314(e)(1)** View, Download and Transmit to 3rd Party (*Ambulatory*)
   - **170.314(e)(1)** View, Download and Transmit to 3rd Party (*Inpatient*)
   - **170.314(e)(2)** Clinical Summary
   - **Non-specific C-CDA**

3. Click the '*Browse*' button on the TTT display screen. Search for and select the file intended for manual validation which corresponds to the previously selected MU2 objective.
4. Click '*Open*' to upload the selected file.
5. Click the '*Validate*' button.

If the Manual Upload was successful, the TTT will display the results of the validation on that same page.

***Note**: If the Manual Upload was not successful, the TTT will display a message saying "Validation Not Successful. Click 'HELP' to troubleshoot". The results will not be displayed on that same page*

APPENDIX A

Model Driven Health Tools (MDHT)/Meaningful Use (MU) Stage 2 Data Requirements Summary

Outlined in the table below are the Meaningful Use Stage 2 data requirements that the MDHT tool will test for in order to validate Consolidated CDA. The specific sections of a C-CDA template are listed out by MU2 Data Requirement and organized by Objective. Vocabulary Requirements are notes as well.

***Note**: The below Appendix sections are strictly inserted for reference only and not the authoritative source. For additional information, please refer to the following links:*

S&I Framework Home page
http://wiki.siframework.org

Companion Guide to Consolidated CDA for MU2 (page view)
http://wiki.siframework.org/Companion+Guide+to+Consolidated+CDA+for+MU2

Companion Guide to Consolidated CDA for MU2 (direct download)
http://wiki.siframework.org/file/view/Companion_Guide_Requirements_Mapping_r0.xlsx/390200684/Companion_Guide_Requirements_Mapping_r0.xlsx

MU2 – 170.314 (b)(2) Transitions of Care / Referral Summary (Ambulatory)

MU2 170.314 (b)(2) Transition of Care / Referral Summary (Ambulatory)					
MU2 Data Requirements	**C-CDA Location**			**Vocabulary Requirements**	**Additional IG Details**
Data Elements	**Header**		**IG Chapter**		
Patient Name	*recordTarget/patientRole/*	patient/name	2.2.1		
Sex		patient/administrativeGenderCode			
Date of Birth		patient/birthTime			
Race		patient/raceCode		The Office of Management and Budget and Standards for Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, as revised, October 30, 1997	Multiple race codes: sdtc:raceCode
Ethnicity		patient/ethnicGroupCode			C-CDA specifies CDC race/ethnicity value set which contains codes aligned to the OMB guidelines
Preferred Language		patient/languageCommunication		As specified	C-CDA

				by the Library of Congress, ISO 639-2 alpha-3 codes limited to those that also have a correspondin g alpha-2 code in ISO 639-1	specifies RFC 4646, aligns with MU2 ISO 639-2 alpha-3 codes
Provider Name and Office Contact Information	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleP arty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service

					event
Care Team Members	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleParty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service event

Data Elements	Section	Entry		IG Chapter	Vocabulary Requirements	Additional IG Details
Medication Allergies	Allergies (entries required)	2.16.840.1.113883.10.20.22.2.6.1	Allergy Problem Act (2.16.840.1.113883.10.20.22.4.30)	4.2 5.5	RxNorm, a standardized nomenclature for clinical drugs produced by the United	
			Allergy Observation (2.16.840.1.113883.10.	4.2 5.4		

			20.22.4.7)		States National Library of Medicine, August 6, 2012 Release	
Medications	Medication (entries required)	2.16.840.1.113883.10.20.22.2.1.1	Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.33 5.39	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
	Hospital Admission Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.44	Admission Medication (2.16.840.1.113883.10.20.22.4.36)	4.19 5.1		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.19 5.39		
	Hospital Discharge Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.11.1	Discharge Medication (2.16.840.1.113883.10.20.22.4.35)	4.24 5.19		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.24 5.39		
Problems	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59		
Encounter	Problem	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act	4.44	ICD10-CM or	

Diagnoses	(entries required)		(2.16.840.1.113883.10.20.22.4.3)	5.58	IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59		
	Hospital Admission Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.43	Hospital Admission Diagnosis (2.16.840.1.113883.10.20.22.4.34)	4.18 5.32		
	Postprocedure Diagnosis	2.16.840.1.113883.10.20.22.2.36	Postprocedure Diagnosis (2.16.840.1.113883.10.20.22.4.51)	4.42 5.53		
	Postoperative Diagnosis	2.16.840.1.113883.10.20.22.2.35	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.41 5.59		
	Hospital Discharge Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.24	Hospital Discharge Diagnosis (2.16.840.1.113883.10.20.22.4.33)	4.22 5.33		
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.4 5.59		
	Assessment	2.16.840.1.113883.10.20.22.2.8	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.5 5.59		
	Encounters	2.16.840.1.113883.10.20.22.2.22.1	Encounter Activities (2.16.840.1.113883.10.20.22.4.49)	4.11 5.21		
			Encounter Diagnosis (2.16.840.1.113883.10.	4.11 5.22		

			20.22.4.80)			
Reason for Referral	Reason for Referral	1.3.6.1.4.1.19376.1.5.3.1.3.1		4.53		
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10.20.22.4.41)	4.39 5.49		
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10.20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10.20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.2.10	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		
			Plan of Care Activity Encounter (2.16.840.1.113883.10.20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation (2.16.840.1.113883.10.20.22.4.44)	4.39 5.48		
Procedures	Procedures (entries required)	2.16.840.1.113883.10.20.22.2.7.1	Procedure Activity Act (2.16.840.1.113883.10.20.22.4.12)	4.52 5.61	SNOMED-CT or CPT/HCPCS; ICD-10-PCS	Procedure act is for procedures the alter that
			Procedure Activity	4.52		

			Observation (2.16.840.1.113883.10.20.22.4.13)	5.62	and CDT are "optional", meaning they have to certify use of SNOMED CT or CPT/HCPCS as well	physical condition of a patient (Splenectomy). Observation act is for procedures that result in new information about a patient but do not cause physical alteration (EEG). Act is for all other types of procedures (dressing change).
			Procedure Activity Procedure (2.16.840.1.113883.10.20.22.4.14)	4.52 5.63		
Functional Status; Cognitive Status	Functional Status	2.16.840.1.113883.10.20.22.2.14	Functional Status Problem Observation (2.16.840.1.113883.10.20.22.4.68)	4.14 5.27		
			Functional Status Result Observation (2.16.840.1.113883.10.20.22.4.67)	4.14 5.28		
			Functional Status	4.14		

			Result Organizer (2.16.840.1.113883.10.20.22.4.66)	5.28		
			Cognitive Status Problem Observation (2.16.840.1.113883.10.20.22.4.73)	4.14 5.13		
			Cognitive Status Result Observation (2.16.840.1.113883.10.20.22.4.74)	4.14 5.14		
			Cognitive Status Result Organizer (2.16.840.1.113883.10.20.22.4.75)	4.14 5.15		
Vital Signs (height, weight, BP, BMI)	Vital Signs	2.16.840.1.113883.10.20.22.2.4 or 2.16.840.1.113883.10.20.22.2.4.1	Vital Signs Organizer (2.16.840.1.113883.10.20.22.4.26)	4.60 5.82		HIT SC recommended LOINC
			Vital Signs Observation (2.16.840.1.113883.10.20.22.4.27)	4.60 5.81		
Laboratory Tests; Laboratory Value(s) / Result(s)	Results	2.16.840.1.113883.10.20.22.2.3.1	Results Organizer (2.16.840.1.113883.10.20.22.4.1)	4.55 5.71	Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system	
			Results Observation (2.16.840.1.113883.10.20.22.4.2)	4.55 5.70		

					for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.	
Care Plan Field(s), Including Goals and Instructions	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10.20.22.4.41)	4.39 5.49		Possible Vocabulary for Diagnostic Test(s) Pending and Future Scheduled Test(s): Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10.20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10.20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.4.39	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		
			Plan of Care Activity Encounter (2.16.840.1.113883.10.20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation	4.39 5.48		

			(2.16.840.1.113883.10.20.22.4.44)			produced by the Regenstrief Institute, Inc.
Smoking Status	Social History	2.16.840.1.113883.10.20.22.2.17	Smoking Status Observation (2.16.840.1.113883.10.22.4.78)	4.57 5.75	Smoking status must be coded in one of the following SNOMEDCT® codes: (1) Current every day smoker. 449868002 (2) Current some day smoker. 428041000124106 (3) Former smoker. 8517006 (4) Never smoker. 266919005 (5) Smoker, current status unknown. 77176002 (6) Unknown	

					if ever smoked. 266927001 (7) Heavy tobacco smoker. 428071000124103 (8) Light tobacco smoker. 428061000124105	

MU2 – 170.314 (b)(2) Transitions of Care / Referral Summary (Inpatient)

MU2 170.314 (b)(2) Transition of Care / Referral Summary (Inpatient)					
MU2 Data Requirements	**C-CDA Location**			**Vocabulary Requirements**	**Additional IG Details**
Data Elements	**Header**		**IG Chapter**		
Patient Name	*recordTarget/patientRole/*	patient/name	2.2.1		
Sex		patient/administrativeGenderCode			
Date of Birth		patient/birthTime			
Race		patient/raceCode		The Office of Management and Budget and Standards for Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, as revised, October 30, 1997	Multiple race codes: sdtc:raceCode
Ethnicity		patient/ethnicGroupCode			C-CDA specifies CDC race/ethnicity value set which contains codes aligned to the OMB guidelines
Preferred Language		patient/languageCommunication		As specified by the Library	C-CDA specifies RFC

				of Congress, ISO 639-2 alpha-3 codes limited to those that also have a correspondin g alpha-2 code in ISO 639-1	4646, aligns with MU2 ISO 639-2 alpha-3 codes
Care Team Members	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleP arty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service event

Data Elements	Section	Entry		IG Chapter	Vocabulary Requirements	Additional IG Details
Medication Allergies	Allergies (entries required)	2.16.840.1.113883.10.20.22.2.6.1	Allergy Problem Act (2.16.840.1.113883.10.20.22.4.30)	4.2 5.5	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
			Allergy Observation (2.16.840.1.113883.10.20.22.4.7)	4.2 5.4		
Medications	Medication (entries required)	2.16.840.1.113883.10.20.22.2.1.1	Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.33 5.39	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
	Hospital Admission Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.44	Admission Medication (2.16.840.1.113883.10.20.22.4.36)	4.19 5.1		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.19 5.39		
	Hospital Discharge Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.11.1	Discharge Medication (2.16.840.1.113883.10.20.22.4.35)	4.24 5.19		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.24 5.39		

Discharge Instructions	Hospital Discharge Instructions *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.41		4.23	
Problems	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59	
Encounter Diagnoses	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	ICD10-CM or IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59	
	Hospital Admission Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.43	Hospital Admission Diagnosis (2.16.840.1.113883.10.20.22.4.34)	4.18 5.32	
	Postprocedure Diagnosis	2.16.840.1.113883.10.20.22.2.36	Postprocedure Diagnosis (2.16.840.1.113883.10.20.22.4.51)	4.42 5.53	
	Postoperative Diagnosis	2.16.840.1.113883.10.20.22.2.35	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.41 5.59	
	Hospital Discharge Diagnosis	2.16.840.1.113883.10.20.22.2.24	Hospital Discharge Diagnosis	4.22 5.33	

	Inpatient Setting Only		(2.16.840.1.113883.10.20.22.4.33)			
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.4 5.59		
	Assessment	2.16.840.1.113883.10.20.22.2.8	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.5 5.59		
	Encounters	2.16.840.1.113883.10.20.22.2.22.1	Encounter Activities (2.16.840.1.113883.10.20.22.4.49)	4.11 5.21		
			Encounter Diagnosis (2.16.840.1.113883.10.20.22.4.80)	4.11 5.22		
Procedures	Procedures (entries required)	2.16.840.1.113883.10.20.22.2.7.1	Procedure Activity Act (2.16.840.1.113883.10.20.22.4.12)	4.52 5.61	SNOMED-CT or CPT/HCPCS; ICD-10-PCS and CDT are "optional", meaning they have to certify use of SNOMED CT or CPT/HCPCS as well	Procedure act is for procedures the alter that physical condition of a patient (Splenectomy). Observation act is for procedures that result in new information about a patient but
			Procedure Activity Observation (2.16.840.1.113883.10.20.22.4.13)	4.52 5.62		
			Procedure Activity Procedure (2.16.840.1.113883.10.20.22.4.14)	4.52 5.63		

						do not cause physical alteration (EEG). Act is for all other types of procedures (dressing change).
Functional Status; Cognitive Status	Functional Status	2.16.840.1.113883.10.20.22.2.14	Functional Status Problem Observation (2.16.840.1.113883.10.20.22.4.68)	4.14 5.27		
			Functional Status Result Observation (2.16.840.1.113883.10.20.22.4.67)	4.14 5.28		
			Functional Status Result Organizer (2.16.840.1.113883.10.20.22.4.66)	4.14 5.28		
			Cognitive Status Problem Observation (2.16.840.1.113883.10.20.22.4.73)	4.14 5.13		
			Cognitive Status Result Observation (2.16.840.1.113883.10.20.22.4.74)	4.14 5.14		
			Cognitive Status Result Organizer	4.14 5.15		

			(2.16.840.1.113883.10.20.22.4.75)			
Vital Signs (height, weight, BP, BMI)	Vital Signs	2.16.840.1.113883.10.20.22.2.4 or 2.16.840.1.113883.10.20.22.2.4.1	Vital Signs Organizer (2.16.840.1.113883.10.20.22.4.26)	4.60 5.82		HIT SC recommended LOINC
			Vital Signs Observation (2.16.840.1.113883.10.20.22.4.27)	4.60 5.81		
Laboratory Tests; Laboratory Value(s) / Result(s)	Results	2.16.840.1.113883.10.20.22.2.3.1	Results Organizer (2.16.840.1.113883.10.20.22.4.1)	4.55 5.71	Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.	
			Results Observation (2.16.840.1.113883.10.20.22.4.2)	4.55 5.70		
Care Plan Field(s), Including Goals and Instructions	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10	4.39 5.49		Possible Vocabulary for Diagnostic

			.20.22.4.41)			Test(s) Pending and Future Scheduled Test(s): Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10.20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10.20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.4.39	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		
			Plan of Care Activity Encounter (2.16.840.1.113883.10.20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation (2.16.840.1.113883.10.20.22.4.44)	4.39 5.48		
Smoking Status	Social History	2.16.840.1.113883.10.20.22.2.17	Smoking Status Observation (2.16.840.1.113883.10.22.4.78)	4.57 5.75	Smoking status must be coded in one of the following SNOMEDCT® codes: (1) Current	

					every day smoker. 449868002 (2) Current some day smoker. 428041000124106 (3) Former smoker. 8517006 (4) Never smoker. 266919005 (5) Smoker, current status unknown. 77176002 (6) Unknown if ever smoked. 266927001 (7) Heavy tobacco smoker. 428071000124103 (8) Light tobacco smoker.	

					428061000124105	

MU2 – 170.314 (b)(7) Data Portability Export Summary (Ambulatory)

MU2 170.314 (b)(7) Data Portability Export Summary (Ambulatory)					
MU2 Data Requirements	**C-CDA Location**			**Vocabulary Requirements**	**Additional IG Details**
Data Elements	**Header**		**IG Chapter**		
Patient Name	*recordTarget/patientRole/*	patient/name	2.2.1		
Sex		patient/administrativeGenderCode			
Date of Birth		patient/birthTime			
Race		patient/raceCode		The Office of Management and Budget and Standards for Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, as revised, October 30, 1997	Multiple race codes: sdtc:raceCode
Ethnicity		patient/ethnicGroupCode			C-CDA specifies CDC race/ethnicity value set which contains codes aligned to the OMB guidelines

Preferred Language		patient/languageCommunication		As specified by the Library of Congress, ISO 639-2 alpha-3 codes limited to those that also have a corresponding alpha-2 code in ISO 639-1	C-CDA specifies RFC 4646, aligns with MU2 ISO 639-2 alpha-3 codes
Provider Name and Office Contact Information	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsible Party'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing

					the service event
Care Team Members	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsible Party'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service event

Data Elements	Section	Entry	IG Chapter	Vocabulary Requirements	Additional IG Details

Medication Allergies	Allergies (entries required)	2.16.840.1.113883.10.20.22.2.6.1	Allergy Problem Act (2.16.840.1.113883.10.20.22.4.30)	4.2 5.5	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
			Allergy Observation (2.16.840.1.113883.10.20.22.4.7)	4.2 5.4		
Medications	Medication (entries required)	2.16.840.1.113883.10.20.22.2.1.1	Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.33 5.39	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
	Hospital Admission Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.44	Admission Medication (2.16.840.1.113883.10.20.22.4.36)	4.19 5.1		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.19 5.39		
	Hospital Discharge Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.11.1	Discharge Medication (2.16.840.1.113883.10.20.22.4.35)	4.24 5.19		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.24 5.39		
Problems	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	IHTSDO SNOMED CT® International Release July	
			Problem Observation	4.44		

			(2.16.840.1.113883.10.20.22.4.4)	5.59	2012 and US Extension to SNOMED CT® March 2012 Release	
Encounter Diagnoses	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	ICD10-CM or IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59		
	Hospital Admission Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.43	Hospital Admission Diagnosis (2.16.840.1.113883.10.20.22.4.34)	4.18 5.32		
	Postprocedure Diagnosis	2.16.840.1.113883.10.20.22.2.36	Postprocedure Diagnosis (2.16.840.1.113883.10.20.22.4.51)	4.42 5.53		
	Postoperative Diagnosis	2.16.840.1.113883.10.20.22.2.35	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.41 5.59		
	Hospital Discharge Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.24	Hospital Discharge Diagnosis (2.16.840.1.113883.10.20.22.4.33)	4.22 5.33		
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.4 5.59		
	Assessment	2.16.840.1.113883.10.20.22.2.8	Problem Observation (2.16.840.1.113883.10	4.5 5.59		

			.20.22.4.4)			
	Encounters	2.16.840.1.113883.10.20.22.2.22.1	Encounter Activities (2.16.840.1.113883.10 .20.22.4.49)	4.11 5.21		
			Encounter Diagnosis (2.16.840.1.113883.10 .20.22.4.80)	4.11 5.22		
Reason for Referral	Reason for Referral	1.3.6.1.4.1.19376.1.5.3.1.3.1		4.53		
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10 .20.22.4.41)	4.39 5.49		
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10 .20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10 .20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.2.10	Plan of Care Activity Act (2.16.840.1.113883.10 .20.22.4.39)	4.39 5.46		
			Plan of Care Activity Encounter (2.16.840.1.113883.10 .20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation	4.39 5.48		

			(2.16.840.1.113883.10.20.22.4.44)			
Procedures	Procedures (entries required)	2.16.840.1.113883.10.20.22.2.7.1	Procedure Activity Act (2.16.840.1.113883.10.20.22.4.12)	4.52 5.61	SNOMED-CT or CPT/HCPCS; ICD-10-PCS and CDT are "optional", meaning they have to certify use of SNOMED CT or CPT/HCPCS as well	Procedure act is for procedures that alter the physical condition of a patient (Splenectomy). Observation act is for procedures that result in new information about a patient but do not cause physical alteration (EEG). Act is for all other types of procedures (dressing change).
			Procedure Activity Observation (2.16.840.1.113883.10.20.22.4.13)	4.52 5.62		
			Procedure Activity Procedure (2.16.840.1.113883.10.20.22.4.14)	4.52 5.63		
Functional Status; Cognitive Status	Functional Status	2.16.840.1.113883.10.20.22.2.14	Functional Status Problem Observation (2.16.840.1.113883.10.20.22.4.68)	4.14 5.27		

			Functional Status Result Observation (2.16.840.1.113883.10.20.22.4.67)	4.14 5.28		
			Functional Status Result Organizer (2.16.840.1.113883.10.20.22.4.66)	4.14 5.28		
			Cognitive Status Problem Observation (2.16.840.1.113883.10.20.22.4.73)	4.14 5.13		
			Cognitive Status Result Observation (2.16.840.1.113883.10.20.22.4.74)	4.14 5.14		
			Cognitive Status Result Organizer (2.16.840.1.113883.10.20.22.4.75)	4.14 5.15		
Vital Signs (height, weight, BP, BMI)	Vital Signs	2.16.840.1.113883.10.20.22.2.4 or 2.16.840.1.113883.10.20.22.2.4.1	Vital Signs Organizer (2.16.840.1.113883.10.20.22.4.26)	4.60 5.82		HIT SC recommended LOINC
			Vital Signs Observation (2.16.840.1.113883.10.20.22.4.27)	4.60 5.81		
Laboratory Tests; Laboratory Value(s) / Result(s)	Results	2.16.840.1.113883.10.20.22.2.3.1	Results Organizer (2.16.840.1.113883.10.20.22.4.1)	4.55 5.71	Logical Observation Identifiers Names and	
			Results Observation	4.55		

			(2.16.840.1.113883.10.20.22.4.2)	5.70	Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.	
Care Plan Field(s), Including Goals and Instructions	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10.20.22.4.41)	4.39 5.49		Possible Vocabulary for Diagnostic Test(s) Pending and Future Scheduled Test(s): Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10.20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10.20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.4.39	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		

			Plan of Care Activity Encounter (2.16.840.1.113883.10.20.22.4.40)	4.39 5.47		code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.
			Plan of Care Activity Observation (2.16.840.1.113883.10.20.22.4.44)	4.39 5.48		
Smoking Status	Social History	2.16.840.1.113883.10.20.22.2.17	Smoking Status Observation (2.16.840.1.113883.10.22.4.78)	4.57 5.75	Smoking status must be coded in one of the following SNOMEDCT® codes: (1) Current every day smoker. 449868002 (2) Current some day smoker. 428041000124106 (3) Former smoker. 8517006 (4) Never smoker. 266919005	

					(5) Smoker, current status unknown. 77176002 (6) Unknown if ever smoked. 266927001 (7) Heavy tobacco smoker. 428071000124103 (8) Light tobacco smoker. 428061000124105	

MU2 – 170.314 (b)(7) Data Portability Export Summary (Inpatient)

MU2 170.314 (b)(7) Data Portability Export Summary (Inpatient)					
MU2 Data Requirements	**C-CDA Location**			**Vocabulary Requirements**	**Additional IG Details**
Data Elements	**Header**		**IG Chapter**		
Patient Name	*recordTarget/patientRole/*	patient/name	2.2.1		
Sex		patient/administrativeGenderCode			
Date of Birth		patient/birthTime			
Race		patient/raceCode		The Office of Management and Budget and Standards for Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, as revised, October 30, 1997	Multiple race codes: sdtc:raceCode
Ethnicity		patient/ethnicGroupCode			C-CDA specifies CDC race/ethnicity value set which contains codes aligned to the OMB guidelines
Preferred Language		patient/languageCommunication		As specified by the Library	C-CDA specifies RFC

				of Congress, ISO 639-2 alpha-3 codes limited to those that also have a correspondin g alpha-2 code in ISO 639-1	4646, aligns with MU2 ISO 639-2 alpha-3 codes
Care Team Members	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleP arty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service event

Data Elements	Section	Entry		IG Chapter	Vocabulary Requirements	Additional IG Details
Medication Allergies	Allergies (entries required)	2.16.840.1.113883.10.20.22.2.6.1	Allergy Problem Act (2.16.840.1.113883.10.20.22.4.30)	4.2 5.5	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
			Allergy Observation (2.16.840.1.113883.10.20.22.4.7)	4.2 5.4		
Medications	Medication (entries required)	2.16.840.1.113883.10.20.22.2.1.1	Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.33 5.39	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
	Hospital Admission Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.44	Admission Medication (2.16.840.1.113883.10.20.22.4.36)	4.19 5.1		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.19 5.39		
	Hospital Discharge Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.11.1	Discharge Medication (2.16.840.1.113883.10.20.22.4.35)	4.24 5.19		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.24 5.39		

Discharge Instructions	Hospital Discharge Instructions *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.41		4.23	
Problems	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59	
Encounter Diagnoses	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	ICD10-CM or IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59	
	Hospital Admission Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.43	Hospital Admission Diagnosis (2.16.840.1.113883.10.20.22.4.34)	4.18 5.32	
	Postprocedure Diagnosis	2.16.840.1.113883.10.20.22.2.36	Postprocedure Diagnosis (2.16.840.1.113883.10.20.22.4.51)	4.42 5.53	
	Postoperative Diagnosis	2.16.840.1.113883.10.20.22.2.35	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.41 5.59	
	Hospital Discharge Diagnosis	2.16.840.1.113883.10.20.22.2.24	Hospital Discharge Diagnosis	4.22 5.33	

	Inpatient Setting Only		(2.16.840.1.113883.10.20.22.4.33)			
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.4 5.59		
	Assessment	2.16.840.1.113883.10.20.22.2.8	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.5 5.59		
	Encounters	2.16.840.1.113883.10.20.22.2.22.1	Encounter Activities (2.16.840.1.113883.10.20.22.4.49)	4.11 5.21		
			Encounter Diagnosis (2.16.840.1.113883.10.20.22.4.80)	4.11 5.22		
Procedures	Procedures (entries required)	2.16.840.1.113883.10.20.22.2.7.1	Procedure Activity Act (2.16.840.1.113883.10.20.22.4.12)	4.52 5.61	SNOMED-CT or CPT/HCPCS; ICD-10-PCS and CDT are "optional", meaning they have to certify use of SNOMED CT or CPT/HCPCS as well	Procedure act is for procedures the alter that physical condition of a patient (Splenectomy). Observation act is for procedures that result in new information about a patient but
			Procedure Activity Observation (2.16.840.1.113883.10.20.22.4.13)	4.52 5.62		
			Procedure Activity Procedure (2.16.840.1.113883.10.20.22.4.14)	4.52 5.63		

						do not cause physical alteration (EEG). Act is for all other types of procedures (dressing change).
Functional Status; Cognitive Status	Functional Status	2.16.840.1.113883.10.20.22.2.14	Functional Status Problem Observation (2.16.840.1.113883.10.20.22.4.68)	4.14 5.27		
			Functional Status Result Observation (2.16.840.1.113883.10.20.22.4.67)	4.14 5.28		
			Functional Status Result Organizer (2.16.840.1.113883.10.20.22.4.66)	4.14 5.28		
			Cognitive Status Problem Observation (2.16.840.1.113883.10.20.22.4.73)	4.14 5.13		
			Cognitive Status Result Observation (2.16.840.1.113883.10.20.22.4.74)	4.14 5.14		
			Cognitive Status Result Organizer	4.14 5.15		

			(2.16.840.1.113883.10.20.22.4.75)			
Vital Signs (height, weight, BP, BMI)	Vital Signs	2.16.840.1.113883.10.20.22.2.4 or 2.16.840.1.113883.10.20.22.2.4.1	Vital Signs Organizer (2.16.840.1.113883.10.20.22.4.26)	4.60 5.82		HIT SC recommended LOINC
			Vital Signs Observation (2.16.840.1.113883.10.20.22.4.27)	4.60 5.81		
Laboratory Tests; Laboratory Value(s) / Result(s)	Results	2.16.840.1.113883.10.20.22.2.3.1	Results Organizer (2.16.840.1.113883.10.20.22.4.1)	4.55 5.71	Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.	
			Results Observation (2.16.840.1.113883.10.20.22.4.2)	4.55 5.70		
Care Plan Field(s), Including Goals and Instructions	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10	4.39 5.49		Possible Vocabulary for Diagnostic

			.20.22.4.41)			
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10 .20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10 .20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.4.39	Plan of Care Activity Act (2.16.840.1.113883.10 .20.22.4.39)	4.39 5.46		
			Plan of Care Activity Encounter (2.16.840.1.113883.10 .20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation (2.16.840.1.113883.10 .20.22.4.44)	4.39 5.48		
Smoking Status	Social History	2.16.840.1.113883.10.20.22.2.17	Smoking Status Observation (2.16.840.1.113883.10 .22.4.78)	4.57 5.75	Smoking status must be coded in one of the following SNOMEDCT® codes: (1) Current	

					every day smoker. 449868002 (2) Current some day smoker. 428041000124106 (3) Former smoker. 8517006 (4) Never smoker. 266919005 (5) Smoker, current status unknown. 77176002 (6) Unknown if ever smoked. 266927001 (7) Heavy tobacco smoker. 428071000124103 (8) Light tobacco smoker.	

					428061000124105	

MU2 – 170.314 (e)(1) View, Download, or Transmit to 3rd Party (Ambulatory)

MU2 170.314 (e)(1) View, Download, or Transmit to 3rd Party (Ambulatory)					
MU2 Data Requirements	**C-CDA Location**			**Vocabulary Requirements**	**Additional IG Details**
Data Elements	**Header**		**IG Chapter**		
Patient Name	*recordTarget/patientRole/*	patient/name	2.2.1		
Sex		patient/administrativeGenderCode			
Date of Birth		patient/birthTime			
Race		patient/raceCode		The Office of Management and Budget and Standards for Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, as revised, October 30, 1997	Multiple race codes: sdtc:raceCode
Ethnicity		patient/ethnicGroupCode			C-CDA specifies CDC race/ethnicity value set which contains codes aligned to the OMB guidelines
Preferred Language		patient/languageCommunication		As specified by the Library	C-CDA specifies RFC

				of Congress, ISO 639-2 alpha-3 codes limited to those that also have a correspondin g alpha-2 code in ISO 639-1	4646, aligns with MU2 ISO 639-2 alpha-3 codes
Provider Name and Office Contact Information	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleP arty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service event

Care Team Members	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleParty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service event

Data Elements	Section	Entry		IG Chapter	Vocabulary Requirements	Additional IG Details
Medication Allergies	Allergies (entries required)	2.16.840.1.113883.10.20.22.2.6.1	Allergy Problem Act (2.16.840.1.113883.10.20.22.4.30)	4.2 5.5	RxNorm, a standardized nomenclature for clinical drugs produced by the United	
			Allergy Observation (2.16.840.1.113883.10.20.22.4.7)	4.2 5.4		

					States National Library of Medicine, August 6, 2012 Release	
Medications	Medication (entries required)	2.16.840.1.113883.10.20.22.2.1.1	Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.33 5.39	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
	Hospital Admission Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.44	Admission Medication (2.16.840.1.113883.10.20.22.4.36)	4.19 5.1		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.19 5.39		
	Hospital Discharge Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.11.1	Discharge Medication (2.16.840.1.113883.10.20.22.4.35)	4.24 5.19		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.24 5.39		
Problems	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59		
Procedures	Procedures (entries	2.16.840.1.113883.10.20.22.2.7.1	Procedure Activity Act	4.52	SNOMED-CT	Procedure

	required)		(2.16.840.1.113883.10.20.22.4.12)	5.61	or CPT/HCPCS; ICD-10-PCS and CDT are "optional", meaning they have to certify use of SNOMED CT or CPT/HCPCS as well	act is for procedures the alter that physical condition of a patient (Splenectomy). Observation act is for procedures that result in new information about a patient but do not cause physical alteration (EEG). Act is for all other types of procedures (dressing change).
			Procedure Activity Observation (2.16.840.1.113883.10.20.22.4.13)	4.52 5.62		
			Procedure Activity Procedure (2.16.840.1.113883.10.20.22.4.14)	4.52 5.63		
Vital Signs (height, weight, BP, BMI)	Vital Signs	2.16.840.1.113883.10.20.22.2.4 or 2.16.840.1.113883.10.20.22.2.4.1	Vital Signs Organizer (2.16.840.1.113883.10.20.22.4.26)	4.60 5.82		HIT SC recommended LOINC
			Vital Signs Observation (2.16.840.1.113883.10	4.60 5.81		

			.20.22.4.27)			
Laboratory Tests; Laboratory Value(s) / Result(s)	Results	2.16.840.1.113883.10.20.22.2.3.1	Results Organizer (2.16.840.1.113883.10 .20.22.4.1)	4.55 5.71	Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.	
			Results Observation (2.16.840.1.113883.10 .20.22.4.2)	4.55 5.70		
Care Plan Field(s), Including Goals and Instructions	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10 .20.22.4.41)	4.39 5.49		Possible Vocabulary for Diagnostic Test(s) Pending and Future Scheduled Test(s): Logical Observation Identifiers Names and
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10 .20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10	4.39 5.51		

			.20.22.4.43)			
	Plan of Care	2.16.840.1.113883.10.20.22.4.39	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.
			Plan of Care Activity Encounter (2.16.840.1.113883.10.20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation (2.16.840.1.113883.10.20.22.4.44)	4.39 5.48		
Smoking Status	Social History	2.16.840.1.113883.10.20.22.2.17	Smoking Status Observation (2.16.840.1.113883.10.22.4.78)	4.57 5.75	Smoking status must be coded in one of the following SNOMEDCT® codes: (1) Current every day smoker. 449868002 (2) Current some day smoker. 428041000124106	

					(3) Former smoker. 8517006 (4) Never smoker. 266919005 (5) Smoker, current status unknown. 77176002 (6) Unknown if ever smoked. 266927001 (7) Heavy tobacco smoker. 428071000124103 (8) Light tobacco smoker. 428061000124105	

MU2 – 170.314 (e)(1) View, Download, or Transmit to 3rd Party (Inpatient)

MU2 170.314 (e)(1) View, Download, or Transmit to 3rd Party (Inpatient)					
MU2 Data Requirements	**C-CDA Location**			**Vocabulary Requirements**	**Additional IG Details**
Data Elements	**Header**		**IG Chapter**		
Patient Name	*recordTarget/patientRole/*	patient/name	2.2.1		
Sex		patient/administrativeGenderCode			
Date of Birth		patient/birthTime			
Race		patient/raceCode		The Office of Management and Budget and Standards for Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, as revised, October 30, 1997	Multiple race codes: sdtc:raceCode
Ethnicity		patient/ethnicGroupCode			C-CDA specifies CDC race/ethnicity value set which contains codes aligned to the OMB guidelines
Preferred Language		patient/languageCommunication		As specified by the Library	C-CDA specifies RFC

				of Congress, ISO 639-2 alpha-3 codes limited to those that also have a correspondin g alpha-2 code in ISO 639-1	4646, aligns with MU2 ISO 639-2 alpha-3 codes
Admission Date	*componentOf/encompassingEncounter/*	effectiveTime/low	2.2.13		
Discharge Date		effectiveTime/high			
Admission and Discharge Location		Location/healthcareFacility/location			
Care Team Members	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleP arty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and

					providers performing the service event

Data Elements	Section	Entry		IG Chapter	Vocabulary Requirements	Additional IG Details
Medication Allergies	Allergies (entries required)	2.16.840.1.113883.10.20.22.2.6.1	Allergy Problem Act (2.16.840.1.113883.10.20.22.4.30)	4.2 5.5	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
			Allergy Observation (2.16.840.1.113883.10.20.22.4.7)	4.2 5.4		
Medications	Medication (entries required)	2.16.840.1.113883.10.20.22.2.1.1	Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.33 5.39	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine,	
	Hospital Admission Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.44	Admission Medication (2.16.840.1.113883.10.20.22.4.36)	4.19 5.1		
			Medication Activity (2.16.840.1.113883.10.20.22.4.16)	4.19 5.39		
	Hospital Discharge Medications	2.16.840.1.113883.10.20.22.2.11.1	Discharge Medication (2.16.840.1.113883.10	4.24 5.19		

	Inpatient Setting Only		.20.22.4.35)		August 6, 2012 Release	
			Medication Activity (2.16.840.1.113883.10 .20.22.4.16)	4.24 5.39		
Discharge Instructions	Hospital Discharge Instructions *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.41		4.23		
Problems	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10 .20.22.4.3)	4.44 5.58	IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	
			Problem Observation (2.16.840.1.113883.10 .20.22.4.4)	4.44 5.59		
Reason for Hospitalization	Hospital Admission Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.43	Hospital Admission Diagnosis (2.16.840.1.113883.10 .20.22.4.34)	4.18 5.32		Chief Complaint captures the patient's description of the problem and Reason for Visit captures the Provider's description of the problem.
	Preoperative Diagnosis	2.16.840.1.113883.10.20.22.2.35	Preoperative Diagnosis (2.16.840.1.113883.10 .20.22.4.65)	4.43 5.56		
	Chief Complaint	1.3.6.1.4.1.19376.1.5.3.1.1.13.2.1		4.7		
	Chief Complaint and Reason for Visit	2.16.840.1.113883.10.20.22.2.13		4.6		
	Reason for Visit	2.16.840.1.113883.10.20.22.2.12		4.54		
	Encounters	2.16.840.1.113883.10.20.22.2.22.1	Indication (2.16.840.1.113883.10 .20.22.4.19)	4.11 5.37		

Procedures	Procedures (entries required)	2.16.840.1.113883.10.20.22.2.7.1	Procedure Activity Act (2.16.840.1.113883.10.20.22.4.12)	4.52 5.61	SNOMED-CT or CPT/HCPCS; ICD-10-PCS and CDT are "optional", meaning they have to certify use of SNOMED CT or CPT/HCPCS as well	Procedure act is for procedures the alter that physical condition of a patient (Splenectomy). Observation act is for procedures that result in new information about a patient but do not cause physical alteration (EEG). Act is for all other types of procedures (dressing change).
			Procedure Activity Observation (2.16.840.1.113883.10.20.22.4.13)	4.52 5.62		
			Procedure Activity Procedure (2.16.840.1.113883.10.20.22.4.14)	4.52 5.63		
Vital Signs (height, weight, BP, BMI)	Vital Signs	2.16.840.1.113883.10.20.22.2.4 or 2.16.840.1.113883.10.20.22.2.4.1	Vital Signs Organizer (2.16.840.1.113883.10.20.22.4.26)	4.60 5.82		HIT SC recommended LOINC
			Vital Signs Observation	4.60 5.81		

			(2.16.840.1.113883.10.20.22.4.27)			
Laboratory Tests; Laboratory Value(s) / Result(s)	Results	2.16.840.1.113883.10.20.22.2.3.1	Results Organizer (2.16.840.1.113883.10.20.22.4.1)	4.55 5.71	Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.	
			Results Observation (2.16.840.1.113883.10.20.22.4.2)	4.55 5.70		
Care Plan Field(s), Including Goals and Instructions	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10.20.22.4.41)	4.39 5.49		Possible Vocabulary for Diagnostic Test(s) Pending and Future Scheduled Test(s): Logical Observation Identifiers
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10.20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply	4.39 5.51		

			(2.16.840.1.113883.10.20.22.4.43)			
	Plan of Care	2.16.840.1.113883.10.20.22.4.39	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.
			Plan of Care Activity Encounter (2.16.840.1.113883.10.20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation (2.16.840.1.113883.10.20.22.4.44)	4.39 5.48		
Smoking Status	Social History	2.16.840.1.113883.10.20.22.2.17	Smoking Status Observation (2.16.840.1.113883.10.22.4.78)	4.57 5.75	Smoking status must be coded in one of the following SNOMEDCT® codes: (1) Current every day smoker. 449868002 (2) Current some day smoker. 42804100012	

					4106 (3) Former smoker. 8517006 (4) Never smoker. 266919005 (5) Smoker, current status unknown. 77176002 (6) Unknown if ever smoked. 266927001 (7) Heavy tobacco smoker. 428071000124103 (8) Light tobacco smoker. 428061000124105	

MU2 – 170.314 (e)(2) Clinical Summary

MU2 170.314 (e)(2) Clinical Summary					
MU2 Data Requirements	**C-CDA Location**			**Vocabulary Requirements**	**Additional IG Details**
Data Elements	**Header**		**IG Chapter**		
Patient Name	*recordTarget/patientRole/*	patient/name	2.2.1		
Sex		patient/administrativeGenderCode			
Date of Birth		patient/birthTime			
Race		patient/raceCode		The Office of Management and Budget and Standards for Collecting, and Presenting Federal Data on Race and Ethnicity, Statistical Policy Directive No. 15, as revised, October 30, 1997	Multiple race codes: sdtc:raceCode
Ethnicity		patient/ethnicGroupCode			C-CDA specifies CDC race/ethnicity value set which contains codes aligned to the OMB guidelines
Preferred Language		patient/languageCommunication		As specified by the Library	C-CDA specifies RFC

				of Congress, ISO 639-2 alpha-3 codes limited to those that also have a correspondin g alpha-2 code in ISO 639-1	4646, aligns with MU2 ISO 639-2 alpha-3 codes
Date of Visit Visit Location	*componentOf/encompassingEncounter/*	effectiveTime *location/healthcareFacility/location*	2.2.13		
Provider Name and Office Contact Information	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleP arty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing

					the service event
Care Team Members	*componentOf/encompassingEncounter/*	responsibleParty	2.2.13		Care team members and providers participating in the encounter; Care team members or providers responsible for the encounter are noted in 'responsibleParty'
		encounterParticipants			
	documentationOf/serviceEvent/	assignedEntity/assignedPerson	2.2.11		Care team members and providers performing the service event

Data Elements	Section	Entry		IG Chapter	Vocabulary Requirements	Additional IG Details
Medication Allergies	Allergies (entries required)	2.16.840.1.113883.10.20.22.2.6.1	Allergy Problem Act (2.16.840.1.113883.10.20.22.4.30)	4.2 5.5	RxNorm, a standardized nomenclature for clinical drugs	
			Allergy Observation	4.2		

			(2.16.840.1.113883.10 .20.22.4.7)	5.4	produced by the United States National Library of Medicine, August 6, 2012 Release	
Medications	Medication (entries required)	2.16.840.1.113883.10.20.22.2.1.1	Medication Activity (2.16.840.1.113883.10 .20.22.4.16)	4.33 5.39	RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine, August 6, 2012 Release	
	Hospital Admission Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.44	Admission Medication (2.16.840.1.113883.10 .20.22.4.36)	4.19 5.1		
			Medication Activity (2.16.840.1.113883.10 .20.22.4.16)	4.19 5.39		
	Hospital Discharge Medications *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.11.1	Discharge Medication (2.16.840.1.113883.10 .20.22.4.35)	4.24 5.19		
			Medication Activity (2.16.840.1.113883.10 .20.22.4.16)	4.24 5.39		
Problems	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10 .20.22.4.3)	4.44 5.58	IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012	
			Problem Observation (2.16.840.1.113883.10 .20.22.4.4)	4.44 5.59		

					Release	
Encounter Diagnoses	Problem (entries required)	2.16.840.1.113883.10.20.22.2.5.1	Problem Concern Act (2.16.840.1.113883.10.20.22.4.3)	4.44 5.58	ICD10-CM or IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	
			Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.44 5.59		
	Hospital Admission Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.43	Hospital Admission Diagnosis (2.16.840.1.113883.10.20.22.4.34)	4.18 5.32		
	Postprocedure Diagnosis	2.16.840.1.113883.10.20.22.2.36	Postprocedure Diagnosis (2.16.840.1.113883.10.20.22.4.51)	4.42 5.53		
	Postoperative Diagnosis	2.16.840.1.113883.10.20.22.2.35	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.41 5.59		
	Hospital Discharge Diagnosis *Inpatient Setting Only*	2.16.840.1.113883.10.20.22.2.24	Hospital Discharge Diagnosis (2.16.840.1.113883.10.20.22.4.33)	4.22 5.33		
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.4 5.59		
	Assessment	2.16.840.1.113883.10.20.22.2.8	Problem Observation (2.16.840.1.113883.10.20.22.4.4)	4.5 5.59		
	Encounters	2.16.840.1.113883.10.20.22.2.22.1	Encounter Activities (2.16.840.1.113883.10.20.22.4.49)	4.11 5.21		

			Encounter Diagnosis (2.16.840.1.113883.10.20.22.4.80)	4.11 5.22		
Reason for Referral	Reason for Referral	1.3.6.1.4.1.19376.1.5.3.1.3.1		4.53		
	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10.20.22.4.41)	4.39 5.49		
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10.20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10.20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.2.10	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		
			Plan of Care Activity Encounter (2.16.840.1.113883.10.20.22.4.40)	4.39 5.47		
			Plan of Care Activity Observation (2.16.840.1.113883.10.20.22.4.44)	4.39 5.48		
Procedures	Procedures (entries required)	2.16.840.1.113883.10.20.22.2.7.1	Procedure Activity Act (2.16.840.1.113883.10	4.52 5.61	SNOMED-CT or	Procedure act is for

			.20.22.4.12)		CPT/HCPCS; ICD-10-PCS and CDT are "optional", meaning they have to certify use of SNOMED CT or CPT/HCPCS as well	procedures the alter that physical condition of a patient (Splenectomy). Observation act is for procedures that result in new information about a patient but do not cause physical alteration (EEG). Act is for all other types of procedures (dressing change).
			Procedure Activity Observation (2.16.840.1.113883.10 .20.22.4.13)	4.52 5.62		
			Procedure Activity Procedure (2.16.840.1.113883.10 .20.22.4.14)	4.52 5.63		
Functional Status; Cognitive Status	Functional Status	2.16.840.1.113883.10.20.22.2.14	Functional Status Problem Observation (2.16.840.1.113883.10 .20.22.4.68)	4.14 5.27		
			Functional Status Result Observation (2.16.840.1.113883.10	4.14 5.28		

			.20.22.4.67)			
			Functional Status Result Organizer (2.16.840.1.113883.10 .20.22.4.66)	4.14 5.28		
			Cognitive Status Problem Observation (2.16.840.1.113883.10 .20.22.4.73)	4.14 5.13		
			Cognitive Status Result Observation (2.16.840.1.113883.10 .20.22.4.74)	4.14 5.14		
			Cognitive Status Result Organizer (2.16.840.1.113883.10 .20.22.4.75)	4.14 5.15		
Vital Signs (height, weight, BP, BMI)	Vital Signs	2.16.840.1.113883.10.20.22.2.4 or 2.16.840.1.113883.10.20.22.2.4.1	Vital Signs Organizer (2.16.840.1.113883.10 .20.22.4.26)	4.60 5.82		HIT SC recommended LOINC
			Vital Signs Observation (2.16.840.1.113883.10 .20.22.4.27)	4.60 5.81		
Laboratory Tests; Laboratory Value(s) / Result(s)	Results	2.16.840.1.113883.10.20.22.2.3.1	Results Organizer (2.16.840.1.113883.10 .20.22.4.1)	4.55 5.71	Logical Observation Identifiers Names and Codes (LOINC®) Database	
			Results Observation (2.16.840.1.113883.10 .20.22.4.2)	4.55 5.70		

					version 2.40, a universal code system for identifying laboratory and clinical observations produced by the Regenstrief Institute, Inc.	
Care Plan Field(s), Including Goals and Instructions	Assessment and Plan	2.16.840.1.113883.10.20.22.2.9	Plan of Care Activity Procedure (2.16.840.1.113883.10.20.22.4.41)	4.39 5.49		Possible Vocabulary for Diagnostic Test(s) Pending and Future Scheduled Test(s): Logical Observation Identifiers Names and Codes (LOINC®) Database version 2.40, a universal code system for identifying
			Plan of Care Activity Substance Administration (2.16.840.1.113883.10.20.22.4.42)	4.39 5.50		
			Plan of Care Activity Supply (2.16.840.1.113883.10.20.22.4.43)	4.39 5.51		
	Plan of Care	2.16.840.1.113883.10.20.22.4.39	Plan of Care Activity Act (2.16.840.1.113883.10.20.22.4.39)	4.39 5.46		
			Plan of Care Activity Encounter	4.39 5.47		

			(2.16.840.1.113883.10.20.22.4.40)			laboratory and clinical observations produced by the Regenstrief Institute, Inc.
			Plan of Care Activity Observation (2.16.840.1.113883.10.20.22.4.44)	4.39 5.48		
Smoking Status	Social History	2.16.840.1.113883.10.20.22.2.17	Smoking Status Observation (2.16.840.1.113883.10.22.4.78)	4.57 5.75	Smoking status must be coded in one of the following SNOMEDCT® codes: (1) Current every day smoker. 449868002 (2) Current some day smoker. 428041000124106 (3) Former smoker. 8517006 (4) Never smoker. 266919005 (5) Smoker, current	

					status unknown. 77176002 (6) Unknown if ever smoked. 266927001 (7) Heavy tobacco smoker. 428071000124103 (8) Light tobacco smoker. 428061000124105	