NIST Normative Test Process Document: eDOS-EHR Test Tool for Incorporation of Laboratory Order Compendium

Test Tool and Test Descriptions to Conduct HIT Conformance Testing

NIST Approved Version 1.2

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**Developed by the National Institute of Standards and Technology (NIST) in collaboration with the Association of Public Health Laboratories (APHL) and the Centers for Disease Control and Prevention (CDC)**

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## NIST Normative Test Process Document for eDOS-LIS: Incorporate laboratory order compendium

This document describes the testing process for which a National Institute of Standards and Technology (NIST) validation test tool is used in evaluating conformance of a health information technology module (Health IT Module) for receiving and incorporating HL7 laboratory order compendium (electronic Directory of Services – eDOS) messages created in accordance with the *HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Test Compendium Framework R2, DSTU Release 2 - US Realm, September 2015* interoperability standard and, at a minimum, the *LOINC version* 2.50 vocabulary standard.

### Conformance Criteria

Receive and incorporate laboratory order compendium (eDOS) messages

Health IT Module (e.g., an electronic health record system (EHR-S)) must be able to receive and incorporate:

1. New laboratory order compendium messages conforming to the *HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Test Compendium Framework R2, DSTU Release 2 - US Realm, September 2015* interoperability standard, and (at minimum) the *LOINC version* 2.50 vocabulary standard
2. Updated laboratory order compendium messages conforming to the *HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Test Compendium Framework R2, DSTU Release 2 - US Realm,* *September 2015* interoperability standard, and (at minimum) the *LOINC version* 2.50 vocabulary standard

### Explanation of Terms

| **Key for Names and Terms Used Frequently in this Document** | |
| --- | --- |
| **Referenced Names and Terms** | **Equivalent Used in Document** |
| *HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Test Compendium Framework R2, DSTU Release 2 - US Realm, September 2015* | **“eDOS Implementation Guide” or “eDOS IG”** |
| Logical Observation Identifiers Names and Codes (LOINC) version 2.50 | **“LOINC” or “LOINC 2.50”** |
| Health IT Module | **“HIT Module” or “Module”** |
| Electronic health record system | **“EHR-S”** |
| [NIST HL7 v2 Validation tool – Laboratory Test Compendium Framework R2](http://hit-dev.nist.gov:8081/lri-r2/) | **“eDOS Test Tool” or “Tool”** |
| Context-based EHR Test Plan | **“Context-based eDOS-EHR Test Plan” or “eDOS-EHR Test Cases”** |

### Informative Test Description

This section provides an executive summary describing how the NIST testing process is organized and conducted. The *Understanding eDOS-EHR Messaging Conformance Testing* document is available via the Documentation tab in the NIST eDOS Test Tool; this document is an additional resource that explains the process of Health IT Module conformance testing for HL7 v2 eDOS Messaging on the EHR receiver side.

This document has been developed to be used by testers in conformance testing of Health IT Modules. The term “Tester”, when used in this document, refers to a person (such as a testing lab employee) acting on behalf of a testing lab or other entity for conformance testing of a Vendor’s HIT Module. In addition, a Vendor may use this document to test their own HIT Modules during development of their product and in preparation for conformance testing by a testing lab, and individual implementations of the eDOS IG may use this document when verifying conformance on the receiver side.

The test evaluates the capability for a Health IT Module (e.g., an EHR-S) to process and incorporate electronic HL7 order compendium messages that are conformant to the

* *HL7 Version 2.5.1 Implementation Guide: S&I Framework Laboratory Test Compendium Framework R2, DSTU Release 2 - US Realm, September 2015* interoperability standard
* *LOINC version* 2.50 vocabulary standard

During the process of building the eDOS Test Tool, NIST discovered conformance requirements that were ambiguous in the named standards document. The “*NIST eDOS Test Tool Implementation Decisions*” document explains how they are interpreted in the Tool. This document can be accessed via the Documentation Tab on the eDOS Test Tool.

The eDOS Implementation Guide defines four message types that are relevant for conformance testing for each eDOS transaction; these message types are sent in the following order:

* MFN^M08^MFN\_M08 – Master File Notification Test/Observation (“M08”)
* MFN^M10^MFN\_M10 – Master File Notification Test/Observation Batteries (“M10”)
* MFN^M04^MFN\_M04 – Charge Description Master File Message (“M04”)
* MFN^M18^MFN\_M18 – Test/ Observation (Payer) Master File Message (“M18”)

The eDOS Implementation Guide defines four Acknowledgement message types that are relevant for conformance testing for each eDOS transaction:

* MFK^M08^MFK\_M01 – Master File Acknowledgement Test/Observation
* MFK^M10^MFK\_M01 – Master File Acknowledgement Test/Observation Batteries
* MFK^M04^MFK\_M01 – Master File Acknowledgement Charge Description
* MFK^M18^MFK\_M01 – Master File Acknowledgement Test/Observation (Payer) Master File Message

The eDOS IG defines two eDOS Profile options that are relevant for eDOS-EHR Context-based Validation. Each Profile option is identified either by a Pre-Coordinated OID or a combination of Component OIDs in MSH.21 (Message Profile Identifier):

|  |  |  |  |
| --- | --- | --- | --- |
| **eDOS Profile** | **Pre-Coordinated OID** | **Component OIDs** | **Component Name** |
| EDOS\_GU\_Profile | 2.16.840.1.113883.9.70 | 2.16.840.1.113883.9.67 2.16.840.1.113883.9.68 | EDOS\_Common\_Component EDOS\_GU\_Component |
| EDOS\_NG\_Profile | 2.16.840.1.113883.9.71 | 2.16.840.1.113883.9.67 2.16.840.1.113883.9.69 | EDOS\_Common\_Component EDOS\_NG\_Component |

The Context-based eDOS-EHR Test Plan in the NIST eDOS Test Tool includes **three** Test Scenarios with one to six Test Cases, each of which has four to eight Test Steps (and specific test data) for testing each Profile option. For the purpose of conformance testing, the Vendor must declare conformance to either the EDOS\_GU\_COMPONENT or the EDOS\_NG\_COMPONENT—only one is required. Test Cases with Test Steps are provided for each Profile option. Instructions regarding which Test Cases to use for each Profile option are provided in the **Test Data** section of this testing process document.

For this test procedure, the Tester shall execute all **three** Test Scenarios listed below and all of their associated Test Cases and Test Steps:

1. EDOS 0: Smoke Test Case – minimally populated[[1]](#footnote-1) eDOS messages including Acknowledgements

Step 1: Initial upload of two individual observations (sent to EHR-S)

Step 2: Acknowledgement (sent from EHR-S)

Step 3: Initial upload of single panel test (sent to EHR-S)

Step 4: Acknowledgement (sent from EHR-S)

Step 5: Initial upload of charge code for a panel (sent to EHR-S)

Step 6: Acknowledgement (sent from EHR-S)

Step 7: Initial upload of a list of approved coverage for a panel (sent to EHR-S)

Step 8: Acknowledgement (sent from EHR-S)

1. EDOS 1 – Initial Upload Test Case – maximally populated[[2]](#footnote-2) eDOS messages

Step 1: Initial upload of individual observations (sent to EHR-S)

Step 2: Initial upload of panels and profiles (sent to EHR-S)

Step 3: Initial upload of charge codes for orderable tests and panels (sent to EHR-S)

Step 4: Initial upload of approved coverage information for orderable tests and panels for multiple insurance companies (sent to EHR-S)

Step 5: Initial upload of limited coverage information for orderable tests and panels for multiple insurance companies (sent to EHR-S)

1. EDOS 2 – Update Test Cases – typically populated[[3]](#footnote-3) eDOS messages

Deactivate

Step 1: Deactivate individual observation test that is no longer offered (sent to EHR-S)

Step 2: Deactivate panel/profile test that is no longer offered (sent to EHR-S)

Step 3: Deactivate charge codes of tests that are no longer offered (sent to EHR-S)

Step 4: Update approved coverage information for deactivated tests (sent to EHR-S)

Add

Step 1: Add new individual observation tests (sent to EHR-S)

Step 2: Add new panels and their elements (sent to EHR-S)

Step 3: Add charge codes for newly added individual tests and panels (sent to EHR-S)

Step 4: Add approved coverage information for newly added tests and panels (sent to EHR-S)

Revise

Step 1: Revise information about individual observation tests (sent to EHR-S)

Step 2: Revise information about a panel (sent to EHR-S)

Step 3: Revise charge codes for orderable individual tests and panels (sent to EHR-S)

Step 4: Revise approved coverage information for a test (sent to EHR-S)

Reactivate

Step 1: Reactivate information for individual observation tests (sent to EHR-S)

Step 2: Reactivate information for panels and their elements (sent to EHR-S)

Step 3: Reactivate charge codes for individual tests and panels (sent to EHR-S)

Step 4: Update approved coverage information for reactivated tests and panels (sent to EHR-S)

Update Combo

Step 1: Combination update – addition, revision, deactivation of information for individual observation tests (sent to EHR-S)

Step 2: Combination update – addition, revision, deactivation of information for panels and their elements (sent to EHR-S)

Step 3: Combination update – addition, revision, deactivation of charge codes for tests (sent to EHR-S)

Step 4: Updates limited coverage information for orderable tests and panels; provides information for new lipid panel and an individual lipid test; deactivates arbovirus panel (sent to EHR-S)

Revise postCombo

Step 1: Changes individual observation that was part of a previous update; makes non-orderable individual observation orderable (sent to EHR-S)

Step 2: Changes a panel that was part of a previous update; revises the lipid panel (sent to EHR-S)

Step 3: Changes a charge component that was part of a previous update; adds a CPT charge code for the new individual lipid panel (sent to EHR-S)

Step 4: Changes limited coverage information for newly orderable tests and panels; updates information for the new individual lipid panel components and the revised panel (sent to EHR-S)

These scenarios and the test data contained in them were developed by the Association of Public Health Laboratories (APHL) and the Centers for Disease Control and Prevention (CDC), in collaboration with NIST.

Test data documents, which are accessible from the NIST eDOS Test Tool identified in the **Conformance Test Tools** section of this testing process document, contain the test data that are specific to each Test Case. Instructions for use of the provided test data are listed in the **Normative Test Description** and **Test Data** sections of this testing process document.

**Note: Regarding capabilities that are out-of-scope for the Health IT conformance testing**

* The focus of conformance testing is on the ability of the Health IT Module to receive and process conformant eDOS messages and **is not on** the operational aspect of transporting the messages.

### Normative Test Description

Using the NIST eDOS Test Tool, conformance testing can be completed in either of the following two ways:

* Single message (step by step) eDOS-EHR testing
* Multiple message (multiple step) eDOS-EHR testing

**Single message (step by step) eDOS-EHR** **testing** is a separate validation of each message in an *opened* Test Case. After accessing the EHR Test Plan, *opening* either the GU or NG option, and then *opening* a Test Scenario and a Test Case, the Tester will *select* each of the Test Steps in their given sequence, will click on “Load Test Step”, and validate the incorporation or creation of each message as described in the Derived Test Requirements. Using the features provided on the Test Execution page of the Tool, the Tester is able to keep the default Validation Result value produced by the Tool or use the drop-down menu to select a different value; the Tester also is able to enter free-text into the Comments field by clicking on the pen icon that displays there and then typing into the field. These Validation Result values and free-text Comments become part of the Validation Report generated by the Tool. The Derived Test Requirements (DTR) listed in this document provide the detailed explanation regarding how single message eDOS-EHR testing is performed.

**Multiple message eDOS-EHR** **testing** is similar to single message (step by step) eDOS-EHR testing, except with the capability of loading a complete Test Case (all Test Steps) at once instead of selecting individual Test Steps. After accessing the EHR Test Plan and *opening* either the GU or NG option, the Tester will click on a Test Case, and then will click on the “Load Test Case” button to load the complete Test Case. This mode allows the Tester to progress from one Test Step to another by clicking the “Next” button after each Test Step message is validated. Using the features provided on the Test Execution page of the Tool, the Tester is able to keep the default Validation Result value produced by the Tool or use the drop-down menu to select a different value; the Tester also is able to enter free-text into the Comments field by clicking on the pen icon that displays there and then typing into the field. These Validation Result values and free-text Comments become part of the Validation Report generated by the Tool. When all Test Steps have been validated, the Tester will click on the “Test Summary” button to complete the testing of the Test Case and download the validation reports.

**Derived Test Requirements**

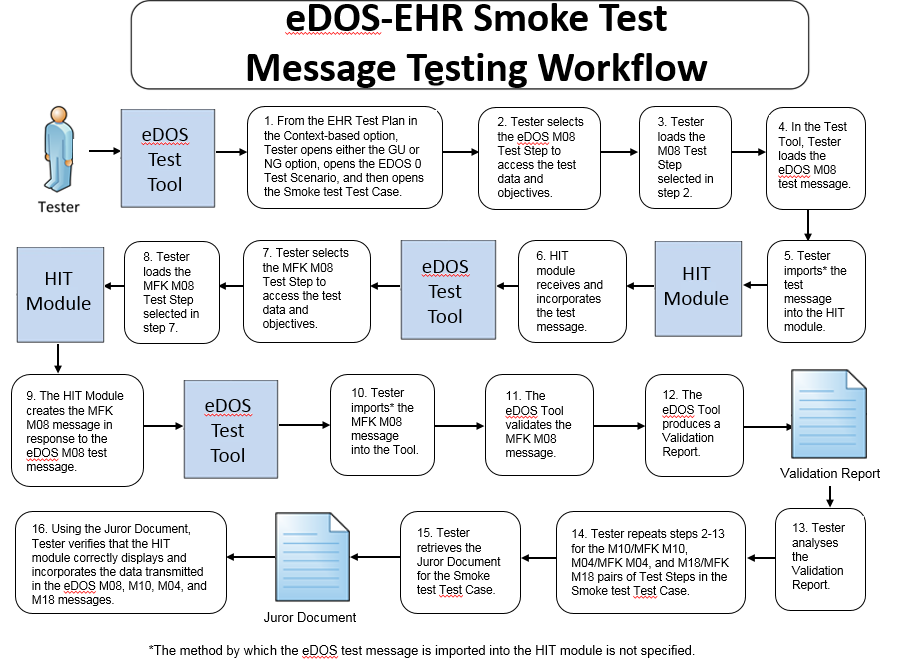
eDOS-EHR\_DTR – 1: Smoke Test - Receive and Incorporate eDOS Messages/Create Acknowledgement Messages

eDOS-EHR\_DTR – 2: Receive and Incorporate eDOS Messages

The instructions in eDOS-EHR\_DTR - 1 below apply only to the EDOS 0 Test Case (Smoke test) in the Test Tool. For the other Test Cases in the Tool, the instructions in eDOS-EHR\_DTR – 2 are to be used.

**eDOS-EHR\_DTR – 1: Smoke Test - Receive and Incorporate eDOS Messages/Create** **Acknowledgement Messages**

Figure 1 Receive, Incorporate Messages/Create Acknowledgement Messages Testing Workflow



The instructions in the testing process listed below reference the numbered test steps in **Figure 1**.

Required Vendor Information

1. Vendor shall identify the Health IT Module function(s) that are available to 1) import[[4]](#footnote-4) the laboratory test compendium messages into the Module, 2) create laboratory test compendium Acknowledgement (MFK) messages, 3) import the MFK messages into the NIST Test Tool, 4) display the information received in the laboratory test compendium messages in the manner indicated by the Display Verification section(s) of the Juror Document, and 4) demonstrate that the HIT module has incorporated the laboratory test compendium messages in the manner indicated by the Incorporate Verification section(s) of the Juror Document
2. Vendor shall provide the mechanism necessary to capture and import the laboratory test compendium messages
3. Vendor shall provide the mechanism necessary to capture and import the laboratory test compendium MFK messages
4. Vendor shall declare conformance to either the EDOS\_GU\_COMPONENT or the EDOS\_NG\_COMPONENT

Required Testing Actions

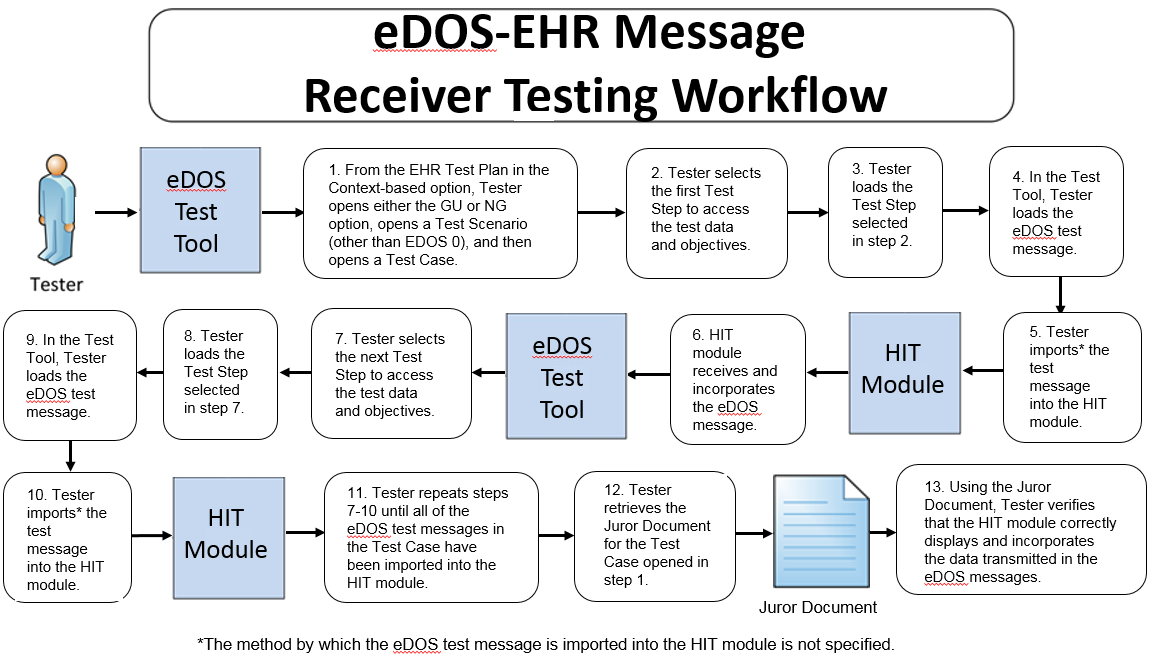
1. Using the Context-based capability provided in the Tool identified in the **Conformance Test Tools** section of this testing process document, the Tester shall access the **EHR Test Plan** and shall open either the GU or NG option based on the vendor’s declared conformance profile, shall open a Test Scenario, and then shall open the Smoke test Test Case [Figure 1, Step 1]
2. The Tester shall select and load the eDOS M08 Test Step [Figure 1, Steps 2 & 3]
3. The Tester shall load the eDOS test message for the selected M08 Test Step and import the test message into the HIT Module [Figure 1, Steps 4 & 5]
4. The Tester shall observe the Module receiving and incorporating the eDOS M08 test message that was imported [Figure 1, Step 6]
5. Continuing with the Smoke Test, the Tester shall select the MFK M08 message Test Step [Figure 1, Step 7]
6. The Tester shall load the MFK M08 Test Step in the NIST Tool [Figure 1, Step 8]
7. The Tester shall use the function(s) in the HIT Module to generate the MFK M08 message created in response to the eDOS M08 message sent to the Module [Figure 1, Step 9]
8. The Tester shall import the MFK M08 message into the NIST Tool [Figure 1, Step 10]
9. The Tool validates the MFK M08 message and produces a Validation Report [Figure 1, Steps 11 & 12]
10. Using the **Inspection Test Guide**, the Tester shall verify the conformance of the MFK M08 message generated by the Module
11. Continuing with the Smoke Test, the Tester shall select and load the eDOS M10 Test Step [Figure 1, Step 14]
12. The Tester shall load the eDOS test message for the selected M10 Test Step and import the test message into the HIT Module
13. The Tester shall observe the Module receiving and incorporating the eDOS M10 test message that was imported
14. Continuing with the Smoke Test, the Tester shall select the MFK M10 message Test Step
15. The Tester shall load the MFK M10 Test Step in the NIST Tool
16. The Tester shall use the function(s) in the HIT Module to generate the MFK M10 message created in response to the eDOS M10 message sent to the Module
17. The Tester shall import the MFK M10 message into the NIST Tool
18. The Tool validates the MFK M10 message and produces a Validation Report
19. Using the **Inspection Test Guide**, the Tester shall verify the conformance of the MFK M10 message generated by the Module
20. Continuing with the Smoke Test, the Tester shall select and load the eDOS M04 Test Step
21. The Tester shall load the eDOS test message for the selected M04 Test Step and import the test message into the HIT Module
22. The Tester shall observe the Module receiving and incorporating the eDOS M04 test message that was imported
23. Continuing with the Smoke Test, the Tester shall select the MFK M04 message Test Step
24. The Tester shall load the MFK M04 Test Step in the NIST Tool
25. The Tester shall use the function(s) in the HIT Module to generate the MFK M04 message created in response to the eDOS M04 message sent to the Module
26. The Tester shall import the MFK M04 message into the NIST Tool
27. The Tool validates the MFK M04 message and produces a Validation Report
28. Using the **Inspection Test Guide**, the Tester shall verify the conformance of the MFK M04 message generated by the Module
29. Continuing with the Smoke Test, the Tester shall select and load the eDOS M18 Test Step
30. The Tester shall load the eDOS test message for the selected M18 Test Step and import the test message into the HIT Module
31. The Tester shall observe the Module receiving and incorporating the eDOS M18 test message that was imported
32. Continuing with the Smoke Test, the Tester shall select the MFK M18 message Test Step
33. The Tester shall load the MFK M18 Test Step in the NIST Tool
34. The Tester shall use the function(s) in the HIT Module to generate the MFK M18 message created in response to the eDOS M18 message sent to the Module
35. The Tester shall import the MFK M18 message into the NIST Tool
36. The Tool validates the MFK M18 message and produces a Validation Report
37. Using the **Inspection Test Guide**, the Tester shall verify the conformance of the MFK M18 message generated by the Module
38. Continuing with the Smoke Test, the Tester shall select the Smoke test Test Case and retrieve the Test Case-specific Juror Document [Figure 1, Step 15]
39. Using the functions in the HIT Module, the provided test data, and the Juror Document, the Tester shall verify that the specified data elements in the imported eDOS M08, M10, M04, and M18 test messages [Figure 1, Step 16]
40. Are displayed electronically according to the eDOS IG
41. Are incorporated into the Module correctly according to the eDOS IG

Inspection Test Guide

1. Using the Validation Report, the Tester shall analyze the Report and verify that the MFK message created by the HIT Module meets the conformance requirements in the eDOS IG [Figure 1, Step 13]

**eDOS-EHR\_DTR – 2: Receive and Incorporate eDOS Messages**

Figure 2 Receive and Incorporate eDOS Messages Testing Workflow



The instructions in the testing process listed below reference the numbered test steps in **Figure 2**.

Required Vendor Information

1. Vendor shall identify the Health IT Module function(s) that are available to 1) import the laboratory test compendium messages into the Module, 2) display the information received in the laboratory test compendium message in the manner indicated by the Display Verification section(s) of the Juror Document, and 3) demonstrate that the HIT module has incorporated a laboratory test compendium message in the manner indicated by the Incorporate Verification section(s) of the Juror Document
2. Vendor shall provide the mechanism necessary to capture and import the laboratory test compendium messages
3. Vendor shall declare conformance to either the EDOS\_GU\_COMPONENT or the EDOS\_NG\_COMPONENT

Required Testing Actions

1. Using the Context-based capability provided in the Tool identified in the **Conformance Test Tools** section of this testing process document, the Tester shall access the **EHR Test Plan** and shall open either the GU or NG option based on the vendor’s declared conformance profile, shall open a Test Scenario (other than EDOS 0), and then shall open a Test Case [Figure 2, Step 1]
2. The Tester shall select the first Test Step [Figure 2, Step 2]
3. The Tester shall load the Test Step [Figure 2, Step 3]
4. In the NIST Tool (which is functioning as an LIS or EHR-S lab module), the Tester shall load the eDOS test message for the selected Test Step and shall import the test message into the HIT Module [Figure 2, Steps 4 & 5]
5. Using the capabilities in the Module, the Tester shall observe the Module receiving and incorporating the eDOS test message that was imported [Figure 2, Step 6]
6. The Tester shall select the next Test Step [Figure 2, Step 7]
7. The Tester shall load the Test Step [Figure 2, Step 8]
8. In the NIST Tool (which is functioning as an LIS or EHR-S lab module), the Tester shall load the eDOS test message for the selected Test Step and shall import the test message into the HIT Module [Figure 2, Steps 9 & 10]
9. The Tester shall repeat Testing Actions 6 – 8 until all of the eDOS test messages for the Test Case have been imported into the HIT Module
10. The Tester shall select the current Test Case and retrieve the Test Case-specific Juror Document from the NIST Tool [Figure 2, Step 12]
11. Using the **Inspection Test Guide**, the Tester shall verify that the HIT Module processed the eDOS messages correctly

Inspection Test Guide

1. Using the functions in the HIT Module, the provided test data, and the Test Case-specific Juror Document, the Tester shall verify that the specified data elements in the imported eDOS M08, M10, M04, and M18 test messages [Figure 2, Step 13]
2. Are displayed electronically according to the eDOS IG
3. Are incorporated into the Module correctly according to the eDOS IG

### Test Data

Test data are provided for the testing process to ensure that the applicable requirements identified in the conformance criteria can be adequately evaluated, as well as to provide consistency in the testing process across multiple testing entities. The provided test data focus on evaluating the basic capabilities required of the Health IT Module, rather than exercising the full breadth/depth of capability that installed Health IT Modules might be expected to support. The test data are formatted for ease of use by the Tester during the testing process; the format is not intended to prescribe the design of the display presented to the end-user for viewing the data. No additional requirements should be drawn from the format.

The Tester shall use and apply the provided test data during the testing, without exception, unless one of the following conditions exists:

* The Tester determines that the Health IT Module is sufficiently specialized that the provided test data need to be modified in order to conduct an adequate test. Having made the determination that some modification to the provided test data is necessary, the Tester shall record the modifications made as part of the test documentation.
* The Tester determines that the LOINC or SNOMED CT code in a message created by the Health IT Module is a **valid code** for a data item (e.g., lab test) even though it is different from the LOINC or SNOMED CT code provided for that data item in the test data for that message

Any departure from the provided test data shall focus on meeting the basic capabilities required of the Health IT Module relative to the conformance criteria rather than exercising the full breadth/depth of capability that the installed Health IT Module might be expected to support.

For conformance testing, the primary purpose of the provided test data is to assist the Tester in verifying that the vendor’s Module is capable of supporting the required functions. The clinical test data are relevant for the given Test Stories; however, these data should not be expected to represent standards of practice.

Test data for conformance testing related to the eDOS-EHR Incorporate laboratory test compendium criterion are available in the NIST eDOS Test Tool (see the **Conformance Test Tools** section of this testing process document for instructions on how to access the Test Tool).

### Navigating a Test Case

An eDOS-EHR Test Case contains multiple Test Steps, and each Test Step includes a Test Story, a Test Data Specification, a Message Content Data Sheet, and an Example HL7 Message. Where applicable, a Test *Case*-specific Juror Document is provided. All of these artifacts are accessible via the NIST Tool.

* The **Test Story** describes a real-world situation that provides the context for the Test Step, as well as providing Test Objectives, Comments, and Pre- and Post-Conditions.
* The **Test Data Specification** provides the data associated with the Test Story and lists the information that would typically be available in a clinical setting. Together, the Test Story and the Test Data Specification provide sufficient information for the Testers and Health IT Module Vendors to comprehend the context of the eDOS message for a particular Test Step.
* The **Message Content Data Sheet** shows a conformant message instance for the Test Step. The message content is organized in a table format that provides the HL7 v2 message elements and the data associated with the message elements for a given Test Step. The Message Content Data Sheet may provide assistance to the Tester and Health IT Module Vendor for resolving issues discovered during conformance testing. This data sheet can be thought of as the “answer” to the scenario (“question”) provided by the Test Story and the Test Data Specification.
* The **Example HL7 Message** shows a conformant encoded eDOS message for the Test Step.
* The **Juror Document** provides a checklist for the Tester to use during conformance testing for assessing the Health IT Module’s ability to display and incorporate required data elements from the information received in the eDOS message. Additional data from the message or from the Health IT Module are permitted to be displayed by the Module. The format of the Juror Document is for ease-of-use by the Tester and does not indicate how the Health IT Module display must be designed.

Artifacts for the Test Step-specific Test Story, Test Data Specification, Message Content Sheet, and Example HL7 Message are provided via the tabs that are displayed when a user selects a Test Step in the Context-based feature of the Test Tool. The artifact for the Test Case-specific Juror Document is accessed by clicking on the Test Case option (e.g., Smoke Test, Initial Load) in the EHR Test Plan of the Context-based feature in the Test Tool. These artifacts also are available in PDF files accessible for downloading via the tabs displayed with each Test Step as well as via the Test Tool Documentation tab.

The eDOS Implementation Guide defines

* Four message types that are relevant for conformance testing
* Four Acknowledgement message types that are relevant for conformance testing
* Two eDOS Profile options that are relevant for eDOS-EHR Context-based Validation.

See the **Informative Test Description** section for details about these message types and Profile options

For the purpose of conformance testing, the Vendor must declare to which profile they are claiming conformance—only one is required. Test Cases and/or Test Steps (and hence specific test data) are provided for each profile option.

Table 1 (eDOS Test Scenarios and Associated Test Cases and Test Steps) lists the **three** Test Scenarios in the Context-based eDOS-EHR Test Plan and identifies the Test Cases and Test Steps for each scenario. For this test procedure, the Tester shall execute all **three** Test Scenarios listed below and all of their associated Test Cases and Test Steps:

**Table 1: eDOS Test Scenarios and Associated Test Cases and Test Steps**

| **Test Scenarios** | **NG Test Cases** | **NG Test Steps** | **GU Test Cases** | **GU Test Steps** |
| --- | --- | --- | --- | --- |
| EDOS 0 | Smoke test | EDOS\_0.0\_1.1-M08\_NG  (Initial upload, 2 individual observations)  MFK\_0.0\_1.1-MFK\_M08\_NG  (Acknowledgement)  EDOS\_0.0\_2.1-M10\_NG  (Initial upload, single panel)  MFK\_0.0\_2.1-MFK\_M10\_NG  (Acknowledgement)  EDOS\_0.0\_3.1-M04\_NG  (Initial upload, charge code for a panel)  MFK\_0.0\_3.1-MFK\_M04\_NG  (Acknowledgement)  EDOS\_0.0\_4.1-M18\_NG  (Initial upload of a list of approved coverage for a panel)  MFK\_0.0\_4.1-MFK\_M18\_NG  (Acknowledgement) | Smoke test | EDOS\_0.0\_1.1-M08\_GU  (Initial upload, 2 individual observations)  MFK\_0.0\_1.1-MFK\_M08\_GU  (Acknowledgement)  EDOS\_0.0\_2.1-M10\_GU  (Initial upload, single panel)  MFK\_0.0\_2.1-MFK\_M10\_GU  (Acknowledgement)  EDOS\_0.0\_3.1-M04\_GU  (Initial upload, charge code for a panel)  MFK\_0.0\_3.1-MFK\_M04\_GU  (Acknowledgement)  EDOS\_0.0\_4.1-M18\_GU  (Initial upload of a list of approved coverage for a panel)  MFK\_0.0\_4.1-MFK\_M18\_GU  (Acknowledgement) |
| EDOS 1 | Initial load | EDOS\_1.0\_1.1-M08\_NG  (Initial upload, individual observations)  EDOS\_1.0\_2.1-M10\_NG  (Initial upload, panels and profiles)  EDOS\_1.0\_3.1-M04\_NG  (Initial upload, charge codes for orderable tests and panels)  EDOS\_1.0\_4.1-M18\_NG  (Initial upload, approved coverage info for orderable tests and panels for multiple insurance companies)  EDOS\_1.0\_5.1-M18\_NG  (Initial upload, limited coverage info for orderable tests and panels for multiple insurance companies) | Initial load | EDOS\_1.0\_1.1-M08\_GU  (Initial upload, individual observations)  EDOS\_1.0\_2.1-M10\_GU  (Initial upload, panels and profiles)  EDOS\_1.0\_3.1-M04\_GU  (Initial upload, charge codes for orderable tests and panels)  EDOS\_1.0\_4.1-M18\_GU  (Initial upload, approved coverage info for orderable tests and panels for multiple insurance companies)  EDOS\_1.0\_5.1-M18\_GU  (Initial upload, limited coverage info for orderable tests and panels for multiple insurance companies) |
|  |
| EDOS 2 | Update deactivate | EDOS\_2.0\_1.1-M08\_NG  (Deactivate individual observation test no longer offered)  EDOS\_2.0\_2.1-M10\_NG  (Deactivate panel/profile test no longer offered)  EDOS\_2.0\_3.1-M04\_NG  (Deactivate charge codes of tests no longer offered)  EDOS\_2.0\_4.1-M18\_NG  (Update approved coverage info for deactivated tests) | Update deactivate | EDOS\_2.0\_1.1-M08\_GU  (Deactivate individual observation test no longer offered)  EDOS\_2.0\_2.1-M10\_GU  (Deactivate panel/profile test no longer offered)  EDOS\_2.0\_3.1-M04\_GU  (Deactivate charge codes of tests no longer offered)  EDOS\_2.0\_4.1-M18\_GU  (Update approved coverage info for deactivated tests) |
| Update add | EDOS\_2.1\_1.1-M08\_NG  (Add new individual observations)  EDOS\_2.1\_2.1-M10\_NG  (Add new panels)  EDOS\_2.1\_3.1-M04\_NG  (Add charge codes for newly added individual tests and panels)  EDOS\_2.1\_4.1-M18\_NG  (Add approved coverage info for added tests and panels) | Update add | EDOS\_2.1\_1.1-M08\_GU  (Add new individual observations)  EDOS\_2.1\_2.1-M10\_GU  (Add new panels)  EDOS\_2.1\_3.1-M04\_GU  (Add charge codes for newly added individual tests and panels)  EDOS\_2.1\_4.1-M18\_GU  (Add approved coverage info for added tests and panels) |
| Update revise | EDOS\_2.2\_1.1-M08\_NG  (Revision info about individual observations)  EDOS\_2.2\_2.1-M10\_NG  (Revisions to a panel)  EDOS\_2.2\_3.1-M04\_NG  (Revisions to charge codes for orderable tests and panels)  EDOS\_2.2\_4.1-M18\_NG  (Revision to approved coverage info for a test) | Update revise | EDOS\_2.2\_1.1-M08\_GU  (Revision info about individual observations)  EDOS\_2.2\_2.1-M10\_GU  (Revisions to a panel)  EDOS\_2.2\_3.1-M04\_GU  (Revisions to charge codes for orderable tests and panels)  EDOS\_2.2\_4.1-M18\_GU  (Revision to approved coverage info for a test) |
| Update reactivate | EDOS\_2.3\_1.1-M08\_NG  (Reactivate info for individual observations)  EDOS\_2.3\_2.1-M10\_NG  (Reactivate info for panels and panel elements)  EDOS\_2.3\_3.1-M04\_NG  (Reactivate charge codes)  EDOS\_2.3\_4.1-M18\_NG  (Update approved coverage info for reactivated tests) | Update reactivate | EDOS\_2.3\_1.1-M08\_GU  (Reactivate info for individual observations)  EDOS\_2.3\_2.1-M10\_GU  (Reactivate info for panels and panel elements)  EDOS\_2.3\_3.1-M04\_GU  (Reactivate charge codes)  EDOS\_2.3\_4.1-M18\_GU  (Update approved coverage info for reactivated tests) |
| Update combo | EDOS\_2.4\_1.1-M08\_NG  (Combination update: addition, revision, deactivation of info for individual observations)  EDOS\_2.4\_2.1-M10\_NG  (Combination update: addition, revision, deactivation of info of panels and panel elements)  EDOS\_2.4\_3.1-M04\_NG  (Combination update: addition, revision, deactivation of info of charge codes)  EDOS\_2.4\_4.1-M18\_NG  (Updates limited coverage information for orderable tests and panels) | Update combo | EDOS\_2.4\_1.1-M08\_GU  (Combination update: addition, revision, deactivation of info for individual observations)  EDOS\_2.4\_2.1-M10\_GU  (Combination update: addition, revision, deactivation of info of panels and panel elements)  EDOS\_2.4\_3.1-M04\_GU  (Combination update: addition, revision, deactivation of info of charge codes)  EDOS\_2.4\_4.1-M18\_GU  (Updates limited coverage information for orderable tests and panels) |
| Update revise postCombo | EDOS\_2.5\_1.1-M08\_NG  (Changes individual observation that was part of a previous update, makes non-orderable individual observation orderable)  EDOS\_2.5\_2.1-M10\_NG  (Changes a panel that was part of a previous update)  EDOS\_2.5\_3.1-M04\_NG  (Changes a charge component that was part of a previous update)  EDOS\_2.5\_4.1-M18\_NG  (Changes limited coverage info for new orderable tests and panels) | Update revise postCombo | EDOS\_2.5\_1.1-M08\_GU  (Changes individual observation that was part of a previous update, makes non-orderable individual observation orderable)  EDOS\_2.5\_2.1-M10\_GU  (Changes a panel that was part of a previous update)  EDOS\_2.5\_3.1-M04\_GU  (Changes a charge component that was part of a previous update)  EDOS\_2.5\_4.1-M18\_GU  (Changes limited coverage info for new orderable tests and panels) |

### How to Interpret and Use the Juror Document

The **Juror Document** categorizes test data according to how the display and incorporation of data in the HIT Module are verified. This document is composed of two sets of tables: one set (labeled “Display Verification : CPOE View”, “Display Verification : Specimen Collection / AOE View”, etc.) lists the data that are required to be *displayed* in the Module in accordance with the eDOS Implementation Guide; the other set (labeled “Incorporate Verification”) lists the data that are required to be *incorporated* into or *stored* in the Module in accordance with the eDOS Implementation Guide. Some elements contained in the eDOS messages are subject to neither verification, and these elements are not provided in the Juror Document.

### Conformance Test Tools

The following testing tool is available to evaluate conformance to the standards referenced in this testing process document:

* [NIST HL7 v2 Validation tool - Laboratory Test Compendium](http://hit-dev.nist.gov:8081/lri-r2/) Framework R2, Release 1.1 – US Realm, an HL7 v2 messaging validation tool; designed to support the NIST conformance testing process
  + The tool is available as a Web Application
* The application can be downloaded for local installation
* The NIST Laboratory Test Compendium test tool Web application is available at:

<http://hl7v2-edos-r1-testing.nist.gov/edos-r2/#/home>

Support for this tool is available by submitting questions to the following user’s group:

<https://groups.google.com/forum/#!forum/hl7v2-lab-compendium-testing>

Inquiries may also be sent to this user group via email: [hl7v2-lab-compendium-testing@googlegroup.com](mailto:hl7v2-lab-compendium-testing@googlegroup.com)

Several browsers may be used to access the eDOS Tool: Chrome (Recommended), Firefox (Recommended), Safari, and IE 9+ are supported.

The following information is provided to assist the Tester in interpreting the **Validation Reports** generated by the eDOS Tool:

The Context-based capability in the Tool evaluates conformance requirements that are specified or have been derived from the standards and implementation guides identified in the conformance criteria and the test data provided for this testing process. The Test Tool evaluates the submitted HL7 message for each conformance requirement, and then produces a Validation Report.

The Tester should consider a Report that contains only Warning and Alert messages to be indicative of a sufficient level of conformance to the standard and test data expectations. If reported, Errors should be considered significant departures from the standard or test data requirements, and these Errors must be corrected in order to claim conformance. Testers will need to further analyze each Error to determine if, in the context of meeting the conformance criterion, the Error results in a failure of the testing process by the Health IT Module.

The NIST context-based testing performs specific content validation depending on the Category assigned to the Data Elements in the message. In some cases, in order to perform this type of validation the NIST Tool expects the repeatable fields/segments/segment groups in the message to be sequenced in a certain order. The complexity of automatically evaluating specific content necessitates this approach. If the Message Validation Result generated by the NIST Tool indicates content-related errors, the Tester may change the order of the fields/segments/segment groups in the test message to match the Test Step once the message has been loaded into the Message Content window of the Test Tool. These kinds of content-related errors do not imply a failure of the vendor product nor a requirement to create the message with the fields/segments/segment groups in a certain order (beyond the base message structure).

## Document History

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| --- | --- | --- |
| **Version Number** | **Description of Change** | **Date Published** |
| 1.0 | Approved Normative Test Process Document | July 18, 2016 |
| 1.1 | Informative Test Description Section   * MFN^M04^MFN\_M04 – Charge Description Master File Message (« M04 »)   Changed to   * MFN^M04^MFN\_M04 – Charge Description Master File Message (“M04”) * MFN^M18^MFN\_M18 – Test/ Observation (Payer) Master File Message (« M18 »)   Changed to   * MFN^M18^MFN\_M18 – Test/ Observation (Payer) Master File Message (“M18”)   Normative Test Description Section   * Derived Test Requirements sub-section rewritten | July 27, 2016 |
| 1.2 | Informative Test Description Section   * Deleted incorrect Step 5 in the list of Test Scenarios and their associated Test Cases and Test Steps for this Test Scenario:  1. EDOS 2 – Update Test Cases – typically populated eDOS messages   Deactivate  Step 5: Initial upload of limited coverage information for orderable tests and panels for multiple insurance companies (sent from LIS or EHR-S lab module) | September 14, 2016 |

1. Minimally populated means the eDOS example messages contain single occurrences of all required ("R") elements [↑](#footnote-ref-1)
2. Maximally populated means the eDOS example messages contain all the R, RE, C(a/b) elements defined in the implementation guide [↑](#footnote-ref-2)
3. Typically populated means the eDOS example messages contain data that are routinely sent whether the data element is R (Required) or RE (Required, but may be empty) [↑](#footnote-ref-3)
4. During conformance testing, the mechanism by which the lab result test message is imported (sent) from or to the Health IT Module being tested is not specified. The Tester may have their own utility, they may allow the Module vendor to use a utility created by that vendor, or the message can be cut from the Module and pasted into the NIST Test Tool or cut from the NIST Test Tool and pasted into the Module. For conformance testing, the key requirement is for the Module to demonstrate real time/dynamic import. [↑](#footnote-ref-4)