Test Procedure for §170.302 (d) Maintain Active Medication List

This document describes the test procedure for evaluating conformance of complete EHRs or EHR modules[1] to the certification criteria defined in 45 CFR Part 170 Subpart C of the Final Rule for Health Information Technology: Initial Set of standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology as published in the Federal Register on July 28, 2010. The document[2] is organized by test procedure and derived test requirements with traceability to the normative certification criteria as described in the Overview document located at http://healthcare.nist.gov/docs/TestProcedureOverview_v1.pdf. The test procedures may be updated to reflect on-going feedback received during the certification activities.

The HHS/Office of the National Coordinator for Health Information Technology (ONC) has defined the standards, implementation guides and certification criteria used in this test procedure. Applicability and interpretation of the standards, implementation guides and certification criteria to EHR technology is determined by ONC. Test procedures to evaluate conformance of EHR technology to ONC's requirements are defined by NIST. Testing of EHR technology is carried out by ONC-Authorized Testing and Certification Bodies (ATCBs), not NIST, as set forth in the final rule establishing the Temporary Certification Program (*Establishment of the Temporary Certification Program for Health Information Technology, 45 CFR Part 170; June 24, 2010*.)

Questions about the applicability of the standards, implementation guides or criteria should be directed to ONC at ONC.Certification@hhs.gov. Questions about the test procedures should be directed to NIST at hit-tst-fdbk@nist.gov. Note that NIST will automatically forward to ONC any questions regarding the applicability of the standards, implementation guides or criteria. Questions about functions and activities of the ATCBs should be directed to ONC at ONC.Certification@hhs.gov.

CERTIFICATION CRITERIA

This Certification Criterion is from the Health Information Technology: Initial Set of Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology Final Rule issued by the Department of Health and Human Services (HHS) on July 28, 2010.

§170.302 (d) Maintain active medication list. Enable a user to electronically record, modify, and retrieve a patient's active medication list as well as medication history for longitudinal care.

[1] Department of Health and Human Services, 45 CFR Part 170 Health Information Technology: Initial Set of Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology, Final Rule, July 28, 2010.

[2] Disclaimer: Certain commercial products are identified in this document. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology.

Per Section III.D of the preamble of the Health Information Technology: Initial Set of Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology, Final Rule where the maintain active medication list certification criterion is discussed:

- "The reference to longitudinal care is intended to convey that the problem list must be comprehensive in the sense that it must be capable of including entries provided over an extended period of time. Consequently, for Complete EHRs and EHR Modules to be certified for an ambulatory setting, they will need to be designed to enable the user to electronically record, modify, and retrieve a patient's problem list over multiple encounters. For an inpatient setting, they will need to enable the user to electronically record, modify, and retrieve a patient's problem list for the duration of an entire hospitalization. This clarification was also requested in relation to the medication list and medication allergy list certification criteria and we have not repeated our response."
- "We clarify that for this certification criterion, and all other certification criteria, the term "retrieve" means the retrieval of information directly stored and managed by Certified EHR Technology and that it does not mean the retrieval of information from external sources, unless explicitly stated otherwise. We also take this opportunity, in the context of our response regarding "longitudinal care" above, to clarify that "medication history" is intended to include a record of prior modifications to a patient's medications."

INFORMATIVE TEST DESCRIPTION

This section provides an informative description of how the test procedure is organized and conducted. It is not intended to provide normative statements of the certification requirements.

This test evaluates the capability for a Complete EHR or EHR Modules to enable a user to electronically record, modify, and retrieve a patient's active medication list and medication history for longitudinal care.

The test procedure is not prescriptive about the method used to modify the problem list. For example, modifying a medication list does not require modifying an existing instance of a medication. Modification can be accomplished through discontinuing/inactivating an existing medication on the list and entering a new instance of the medication.

Based on the text referenced above from the Final Rule, the longitudinal care requirement in this criteria shall be evaluated in the context of the care setting supported by the EHR. Specifically, for EHRs designed for an ambulatory setting, access to the medication information gathered during multiple patient visits to a single Eligible Provider shall be available to the provider. There is no requirement that medication information gathered by other providers or hospitals be accessible. For EHRs designed for an inpatient care setting, access to medication information gathered during the current hospitalization episode of care shall be available to users in the inpatient care setting. There is no requirement that medication information gathered during prior hospitalizations or by Eligible Providers in the ambulatory settings be accessible.

This test procedure is organized into three sections:

- Record - evaluates the capability to enter patient active medication data into the EHR to create the patient active medication list
    - The Tester enters the NIST-supplied patient active medications

- Modify – evaluates the capability to modify patient medication data that have been previously entered into the EHR
    - The Tester displays the patient active medication list data entered during the Record Patient Active Medications test
    - The Tester modifies the previously entered active medication data using NIST-supplied medication data, for example, modifying a medication dose or frequency and discontinuing a medication

- Retrieve – evaluates the capability to display the patient medication list data that have been previously entered into the EHR, including the capability to display the patient medication list as recorded during multiple ambulatory visits with the same provider or during a single inpatient visit
    - The Tester displays the patient active medication data entered during the test
    - The Tester displays the patient medication history, including modified medication data
    - The Tester validates that the displayed medication list data and medication history data are accurate and complete, including the medication list data that were modified during the Modify test

For complete EHR or EHR modules **targeted to the ambulatory setting**, the following derived test requirements apply:

- DTR170.302.d – 1 Electronically Record Patient Active Medication List in an Ambulatory Setting
- DTR170.302.d – 2 Electronically Modify Patient Active Medication List in an Ambulatory Setting
- DTR170.302.d – 3 Electronically Retrieve Patient Active Medication List and Medication History in an Ambulatory Setting

For complete EHR or EHR modules **targeted to the inpatient setting**, the following derived test requirements apply:

- DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting
- DTR170.302.d – 5: Electronically Modify Patient Active Medication List in an Inpatient Setting
- DTR170.302.d – 6: Electronically Retrieve Patient Active Medication List and Medication History in an Inpatient Setting

For complete EHR or EHR modules **targeted to both settings**, the following derived test requirements apply:

- DTR170.302.d – 1 Electronically Record Patient Active Medication List in an Ambulatory Setting
- DTR170.302.d – 2 Electronically Modify Patient Active Medication List in an Ambulatory Setting
- DTR170.302.d – 3 Electronically Retrieve Patient Active Medication List and Medication History in an Ambulatory Setting
- DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting
- DTR170.302.d – 5: Electronically Modify Patient Active Medication List in an Inpatient Setting
- DTR170.302.d – 6: Electronically Retrieve Patient Active Medication List and Medication History in an Inpatient Setting

REFERENCED STANDARDS

None

NORMATIVE TEST PROCEDURES – AMBULATORY SETTING

Derived Test Requirements

DTR170.302.d – 1: Electronically Record Patient Active Medication List in an Ambulatory Setting

DTR170.302.d – 2: Electronically Modify Patient Active Medication List in an Ambulatory Setting

DTR170.302.d – 3: Electronically Retrieve Patient Active Medication List and Medication History in an Ambulatory Setting

DTR170.302.d – 1: Electronically Record Patient Active Medication List in an Ambulatory Setting

Required Vendor Information

VE170.302.d – 1.01: Vendor shall identify a patient with an existing record in the EHR containing patient medications entered during multiple ambulatory visits to the same provider to be used for this test (for testing purposes at least three visits over a multiple month timeframe)

VE170.302.d – 1.02: Vendor shall identify the EHR function(s) that are available to: 1) select the patient, 2) enter patient active medications, 3) modify patient medications, 4) retrieve patient active medication list, and 5) retrieve medication history for longitudinal care

Required Test Procedure:

TE170.302.d – 1.01: Tester shall select patient active medication data from NIST-supplied test data set TD170.302.d – 1

TE170.302.d – 1.02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and enter patient active medications data from the NIST-supplied test data set TD170.302.d – 1

TE170.302.d – 1.03: Using the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient active medication test data have been entered correctly and without omission

Inspection Test Guide

IN170.302.d – 1.01: Using the data in the NIST-supplied Test Data set TD170.302.d – 1 Tester shall verify that the patient active medication list test data are entered correctly and without omission

IN170.302.d – 1.02: Tester shall verify that the patient medication list data are stored in the patient's record

DTR170.302.d – 2: Electronically Modify Patient Active Medication List in an Ambulatory Setting

Required Vendor Information

- As defined in DTR170.302.d – 1, no additional information is required

Required Test Procedure:

TE170.302.d – 2.01: Tester shall select patient medication test data from NIST-supplied test data set TD170.302.d – 2

TE170.302.d – 2.02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record, shall display the patient active medication list data entered during the DTR170.302.d – 1: Electronically Record Patient Active Medication List in an Ambulatory Setting test, and shall modify the previously entered patient medication list data

TE170.302.d – 2.03: Using the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient medication list data modified in TE170.302.d – 2.02 have been entered correctly and without omission

Inspection Test Guide:

IN170.302.d – 2.01: Tester shall verify that the patient active medication data entered during the DTR170.302.d – 1: Electronically Record Patient Active Medication List in an Ambulatory Setting test are accessed and modified

IN170.302.d – 2.02: Using the data in the NIST-supplied Test Data set TD170.302.d – 2, Tester shall verify that the modified medication list data are stored in the patient's record correctly and without omission

DTR170.302.d – 3: Electronically Retrieve Patient Active Medication List and Medication History in an Ambulatory Setting

Required Vendor Information

- As defined in DTR170.302.d – 1, no additional information is required

Required Test Procedure:

TE170.302.d – 3.01: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and shall display the patient active medication data entered during the DTR170.302.d – 1: Electronically Record Patient Active Medication List in an Ambulatory Setting test and modified during the DTR170.302.d – 2: Electronically Modify Patient Active Medication List in an Ambulatory Setting test

TE170.302.d – 3.02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and shall display the patient medication history

TE170.302.d – 3.03: Using the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient active medication test list and the medication history test data display correctly and without omission

Inspection Test Guide

IN170.302.d – 3.01: Using the data in the NIST-supplied Test Data set TD170.302.d – 3a, Tester shall verify that the patient active medication list data entered in the DTR170.302.d – 1: Electronically Record Patient Active Medication List in an Ambulatory Setting test display correctly and without omission

IN170.302.d – 3.02: Using the data in the NIST-supplied Test Data set TD170.302.d – 3b, Tester shall verify that the patient active medication list data entered in the DTR170.302.d – 1: Electronically Record Patient Active Medication List in an Ambulatory Setting test and modified in the DTR170.302.d – 1: Electronically Modify Patient Active Medication List in an Ambulatory Setting test display correctly and without omission

NORMATIVE TEST PROCEDURES – INPATIENT SETTING

Derived Test Requirements

DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting

DTR170.302.d – 5: Electronically Modify Patient Active Medication List in an Inpatient Setting

DTR170.302.d – 6: Electronically Retrieve Patient Active Medication List and Medication History in an Inpatient Setting

DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting

Required Vendor Information

VE170.302.d – 4.01: Vendor shall identify a patient with an existing record in the EHR to be used for this test (for testing purposes over the duration of a hospital visit)

VE170.302.d – 4.02: Vendor shall identify the EHR function(s) that are available to: 1) select the patient, 2) enter patient active medications, 3) modify patient medications, 4) retrieve patient active medication list, and 5) retrieve medication history for longitudinal care

Required Test Procedure:

TE170.302.d – 4.01: Tester shall select patient active medication data from NIST-supplied test data set TD170.302.d – 4

TE170.302.d – 4.02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and enter patient active medications data from the test data set TD170.302.d – 4

TE170.302.d – 4.03: Using the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient active medication test data have been entered correctly and without omission

Inspection Test Guide

IN170.302.d – 4.01: Using the data in the NIST-supplied Test Data set TD170.302.d – 4, Tester shall verify that the patient active medication list test data are entered correctly and without omission

IN170.302.d – 4.02: Tester shall verify that the patient medication list data are stored in the patient's record

DTR170.302.d – 5: Electronically Modify Patient Active Medication List in an Inpatient Setting

Required Vendor Information

- As defined in DTR170.302.d – 4, no additional information is required

Required Test Procedure:

TE170.302.d – 5.01: Tester shall select patient medication test data from NIST-supplied test data set TD170.302.d – 5

TE170.302.d – 5.02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record, shall display the patient active medication list data entered during the DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting test, and shall modify the previously entered patient medication list data

TE170.302.d – 5.03: Using the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient medication list data modified in the DTR170.302.d – 5: Electronically Modify Patient Active Medication List in an Inpatient Setting test have been entered correctly and without omission

Inspection Test Guide:

IN170.302.d – 5.01: Tester shall verify that the patient medication data entered during the DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting test are accessed and modified

IN170.302.d – 5.02: Using the data in the NIST-supplied Test Data set TD170.302.d – 5, Tester shall verify that the modified medication list data are stored in the patient's record correctly and without omission

DTR170.302.d – 6: Electronically Retrieve Patient Active Medication List and Medication History in an Inpatient Setting

Required Vendor Information

- As defined in DTR170.302.d – 4, no additional information is required

Required Test Procedure:

TE170.302.d – 6.01: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and shall display the patient active medication data entered during the DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting and the DTR170.302.d – 5: Electronically Modify Patient Active Medication List in an Inpatient Setting tests

TE170.302.d – 6.02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and shall display the patient medication history

TE170.302.d – 6.03: Using the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient active medication test list and the medication history test data display correctly and without omission

Inspection Test Guide

IN170.302.d – 6.01: Using the data in the NIST-supplied Test Data set TD170.302.d – 6a, Tester shall verify that the patient active medication list data entered in the DTR170.302.d – 4: Electronically Record Patient Active Medication List in an Inpatient Setting test display correctly and without omission

IN170.302.d – 6.02: Using the data in the NIST-supplied Test Data set TD170.302.d – 6b, Tester shall verify that the patient active medication list data entered in the DTR170.302.d – 4: Electronically Record Patient Active Medication List in an

Inpatient Setting test and modified in the DTR170.302.d – 5: Electronically Modify Patient Active Medication List in an Inpatient Setting test display correctly and without omission

TEST DATA

Test data is provided by NIST in this Test Procedure to ensure that the functional and interoperable requirements identified in the criteria can be adequately evaluated for conformance, as well as to provide consistency in the testing process across multiple ONC-Authorized Testing and Certification Bodies (ATCBs). The NIST-supplied test data focus on evaluating the basic capabilities required of EHR technology, rather than exercising the full breadth/depth of capability that installed EHR technology might be expected to support. The test data is formatted for readability of use within the testing process. The format is not prescribing a particular end-user view or rendering. No additional requirements should be drawn from the format.

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

- The Tester determines that the Vendor product is sufficiently specialized that the NIST-supplied test data needs to be modified in order to conduct an adequate test. Having made the determination that some modification to the NIST-supplied test data is necessary, the Tester shall record the modifications made as part of the test documentation.
- The Tester determines that changes to the test data will improve the efficiency of the testing process; primarily through using consistent demographic data throughout the testing workflow. The Tester shall ensure that the functional and interoperable requirements identified in the criterion can be adequately evaluated for conformance and that the test data provides a comparable level of robustness.

Any departure from the NIST-supplied test data shall strictly focus on meeting the basic capabilities required of EHR technology relative to the certification criterion rather than exercising the full breadth/depth of capability that installed EHR technology might be expected to support.

The Test Procedures require that the Tester enter the test data into the EHR technology being evaluated for conformance. The intent is that the Tester fully controls the process of entering the test data in order to ensure that the data are correctly entered as specified in the test procedure. If a situation arises where it is impractical for a Tester to directly enter the test data, the Tester, at the tester's discretion, may instruct the Vendor to enter the test data, so long as the Tester remains in full control of the testing process, directly observes the test data being entered by the Vendor, and validates that the test data are entered correctly as specified in the test procedure.

Ambulatory Setting Test Data

TD170.302.d – 1: Record Active Medications – Ambulatory Setting

- Diabeta (glyburide) 2.5 mg tablet by mouth every morning

- Lipitor (atorvastatin calcium) 10 mg tablet by mouth daily
- Lasix (furosemide) 20 mg tablet by mouth 2 times per day
- Klor-Con (potassium chloride) 10 mEq tablet by mouth 2 times per day
- Erythromycin (erythromycin ethylsuccinate) oral suspension 400 mg by mouth every 6 hours

TD170.302.d – 2: Modify Active Medications – Ambulatory Setting
Discontinue Lipitor
Modify the frequency of Lasix from 2 times per day to **1 time per day**
Modify the dose of Klor-Con from 10 mEq to **20 mEq**

Revised Active Medication List

- Diabeta (glyburide) 2.5 mg tablet by mouth every morning
- Lasix (furosemide) 20 mg tablet by mouth **1 time per day**
- Klor-Con (potassium chloride) **20 mEq** tablet by mouth 2 times per day
- Erythromycin (erythromycin ethylsuccinate) oral suspension 400 mg by mouth every 6 hours

TD170.302.d – 3a: Retrieve Active Medications – Ambulatory Setting

Active Medications only

- Diabeta (glyburide) 2.5 mg tablet by mouth every morning
- Lasix (furosemide) 20 mg tablet by mouth 1 time per day
- Klor-Con (potassium chloride) 20 mEq tablet by mouth 2 times per day
- Erythromycin (erythromycin ethylsuccinate) oral suspension 400 mg by mouth every 6 hours

TD170.302.D – 3b: Retrieve Medication History - Ambulatory Setting

List of all Medications including those that have been discontinued

- Diabeta (glyburide) 2.5 mg tablet by mouth every morning
- Lipitor (atorvastatin calcium) 10 mg tablet by mouth daily -- DISCONTINUED
- Lasix (furosemide) 20 mg tablet by mouth 1 time per day
- Klor-Con (potassium chloride) 20 mEq tablet by mouth 2 times per day
- Erythromycin (erythromycin ethylsuccinate) oral suspension 400 mg by mouth every 6 hours

Inpatient Setting Test Data

TD170.302.d – 4: Record Active Medications – Inpatient Setting

- Norvasc (amlodipine) 5 mg tablet by mouth daily
- Macrobid (nitrofurantoin) 100 mg tablet by mouth daily
- Catapres (clonidine hydrochloride) 0.1 mg tablet by mouth 2 times per day
- Tazicef (ceftazidime pentahydrate) 2 grams intravenous piggy back (IVPB) every 8 hours
- Albuterol inhaler (albuterol sulfate) aerosol 2 puffs by oral inhalation every 4 hours prn for respiratory distress
- Tylenol (acetaminophen) 325 mg tablet by mouth every 4 hours prn for fever greater than 38.3 C
- Milk of Magnesia (magnesium hydroxide) 30 ml by mouth once daily prn for constipation

TD170.302.d – 5: Modify Active Medications – Inpatient Setting

Discontinue Macrobid
Modify the frequency of Albuterol from every 4 hours prn to **every 6 hours prn**
Modify the dose of Tylenol from 325 mg to **650 mg**

Revised Active Medication List

- Norvasc (amlodipine) 5 mg tablet by mouth daily
- Catapres (clonidine hydrochloride) 0.1 mg tablet by mouth 2 times per day
- Tazicef (ceftazidime pentahydrate) 2 grams intravenous piggy back (IVPB) every 8 hours
- Albuterol inhaler (albuterol sulfate) aerosol 2 puffs by oral inhalation **every 6 hours prn** for respiratory distress
- Tylenol (acetaminophen) **650 mg** tablet by mouth every 4 hours prn for fever greater than 38.3 C
- Milk of Magnesia (magnesium hydroxide) 30 ml by mouth once daily prn for constipation

TD170.302.d – 6a: Retrieve Active Medications – Inpatient Setting

Active Medications only

- Norvasc (amlodipine) 5 mg tablet by mouth daily
- Catapres (clonidine hydrochloride) 0.1 mg tablet by mouth 2 times per day
- Tazicef (ceftazidime pentahydrate) 2 grams intravenous piggy back (IVPB) every 8 hours
- Albuterol inhaler (albuterol sulfate) aerosol 2 puffs by oral inhalation every 6 hours prn for respiratory distress

- Tylenol (acetaminophen) 650 mg tablet by mouth every 4 hours prn for fever greater than 38.3 C
- Milk of Magnesia (magnesium hydroxide) 30 ml by mouth once daily prn for constipation

TD170.302.d – 6b: Retrieve Medication History - Inpatient Setting

List of all Medications including those that have been discontinued

- Norvasc (amlodipine) 5 mg tablet by mouth daily
- Macrobid (nitrofurantoin) 100 mg tablet by mouth daily -- DISCONTINUED
- Catapres (clonidine hydrochloride) 0.1 mg tablet by mouth 2 times per day
- Tazicef (ceftazidime pentahydrate) 2 grams intravenous piggy back (IVPB) every 8 hours
- Albuterol inhaler (albuterol sulfate) aerosol 2 puffs by oral inhalation every 6 hours prn for respiratory distress
- Tylenol (acetaminophen) 650 mg tablet by mouth every 4 hours prn for fever greater than 38.3 C
- Milk of Magnesia (magnesium hydroxide) 30 ml by mouth once daily prn for constipation

CONFORMANCE TEST TOOLS

None

Document History

Version Number	Description	Date Published
0.5	Original draft version	February 26, 2010
1.0	Updated to reflect Final Rule	July 21, 2010
1.0	Updated to remove “Pending” from header	August 13, 2010
1.1	Removed “draft” from introductory paragraph In the Informative Test Description section: • Changed the words “edit “and “change” to “modify”, page 3 • Corrected some errors with Ambulatory/Inpatient Wording • Added the following statement, “The test procedure is not prescriptive about the method used to modify the problem list, for example, modifying a medication list does not require modifying an existing instance of a medication. Modification can be accomplished through discontinuing/inactivating an existing medication on the list and entering a new instance of the medication.” In the Normative Test Procedure section: • Corrected numbering of test procedure and test references, pages 6-12 • Corrected typographical errors with Ambulatory vs Inpatient wording, pages 6-12 In the Test Data section: • Changed the word "Change" to "Modify", pages 10-11 • Corrected numbering of test data, page 12 • Deleted the following medication, “Esidrix” (v1.2 9/10)	September 24, 2010