Test Procedure for §170.306 (f) Exchange Clinical Information and Summary Record

This document describes the draft 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.

§170.306 (f) Exchange clinical information and patient summary record.

(1) Electronically receive and display. Electronically receive and display a patient's summary record from other providers and organizations including, at a minimum, diagnostic test results, problem list, medication list, medication allergy list, and procedures in accordance with the

[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.

standard (and applicable implementation specifications) specified in §170.205(a)(1) or §170.205(a)(2). Upon receipt of a patient summary record formatted in the alternative standard, display it in human readable format.

(2) Electronically transmit. Enable a user to electronically transmit a patient's summary record to other providers and organizations including, at a minimum, diagnostic results, problem list, medication list, medication allergy list, and procedures in accordance with:
   (i) The standard (and applicable implementation specifications) specified in §170.205(a)(1) or §170.205(a)(2); and
   (ii) For the following data elements the applicable standard must be used:
      (A) Problems. The standard specified in §170.207(a)(1) or, at a minimum, the version of the standard specified in §170.207(a)(2);
      (B) Procedures. The standard specified in §170.207(b)(1) or §170.207(b)(2);
      (C) Laboratory test results. At a minimum, the version of the standard specified in §170.207(c); and
      (D) Medications. The standard specified in §170.207(d).

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 exchange clinical information and patient summary record certification criterion is discussed:

- "Overall this certification criterion is very similar to the certification criterion applicable to Complete EHRs and EHR Modules designed for an ambulatory setting. As a result, our responses and subsequent changes to the certification criterion above are also applicable to this certification criterion."

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 Module to receive, display, generate and transmit patient summary records including, at a minimum, diagnostic test results, problem list, medication list, and medication allergy list in the formats and vocabularies specified by the referenced standards. Per the FR criterion, the test procedure does not evaluate the capability to send and receive other types of patient information in the patient summary record. Since transport standards are not specified, the transmission portion of the test focuses on the ability to 1) generate a patient summary record and transfer it to an external conformance testing tool for verification of the patient summary instance, and 2) verify the ability to transmit the patient summary record using the transport technology defined by the Vendor.

The test procedure is organized into two sections:

- Receive and Display - evaluates the capability to receive and display (render) a patient summary record in the EHR when received in HL7 CCD format and when received in ASTM CCR format. The patient summary record includes diagnostic test results, problem list, medication list, medication allergy list, and procedures. Included in the test procedure is an evaluation of the capability of the EHR to display (render) in human readable format the received patient summary record that is formatted in the alternative standard
    - The Tester sends to the EHR the NIST-supplied diagnostic test results, problem list, medication list, medication allergy list, and procedures test data in HL7 CCD format
    - Using Vendor-identified EHR functions, the Tester displays the received CCD test data and validates that the rendered data is complete and presented in human readable format.
    - The Tester sends to the EHR the NIST-supplied diagnostic test results, problem list, medication list, medication allergy list, and procedures data formatted in ASTM CCR format
    - Using Vendor-identified EHR functions, the Tester displays the received CCR test data and validates that the rendered data is complete and presented in human readable format

- Generate and Transmit – evaluates the capability to generate and transmit a patient summary record from the EHR in either HL7 CCD or ASTM CCR format as selected by the Vendor. The patient summary record includes diagnostic test results, problem list, medication list, medication allergy list, and procedures. Included in the test procedure is an evaluation of the capability to provide vocabulary coded values as defined by the referenced standards
    - Using Vendor-identified functions, the Tester enters the NIST-supplied diagnostic test results, problem list, medication list, medication allergy list, and procedures test data into the EHR
    - The Tester generates the Patient Summary Record in the format selected by the Vendor (either HL7 CCD or ASTM CCR) and transfers it from the EHR to a NIST conformance test tool
    - Using Vendor-identified functions, the Tester transmits the Patient Summary Record to a receiving system (either a Tester's receiving system or a Vendor-identified system) using the Vendor-identified transport technology of the EHR. This may require configuration on the part of the Tester's receiving system
    - The Tester validates that the generated patient summary record is complete and in conformance
    - The Tester validates that the transmitted Patient Summary Record was transmitted by the EHR

  For this portion of the test, the medications test data will be evaluated for vocabulary conformance to the medications source vocabulary identified by the Vendor as implemented in the EHR. This may require a manual inspection of the test data in the patient summary record instance.

REFERENCED STANDARDS

§170.205 Content exchange and implementation specifications for exchanging electronic health information.	Regulatory Referenced Standard
The Secretary adopts the following content exchange standards and associated implementation specifications:	
(a) Patient Summary Record.	
(1) Standard. Health Level Seven Clinical Document Architecture (CDA) Release 2, Continuity of Care Document (CCD) (incorporated by reference in §170.299). Implementation specifications. The Healthcare Information Technology Standards Panel (HITSP) Summary Documents Using HL7 CCD Component HITSP/C32 (incorporated by reference in §170.299).	
(2) Standard. ASTM E2369 Standard Specification for Continuity of Care Record and Adjunct to ASTM E2369 (incorporated by reference in §170.299).	
§170.207 Vocabulary standards for representing electronic health information.	**Regulatory Referenced Standard**
The Secretary adopts the following code sets, terminology, and nomenclature as the vocabulary standards for the purpose of representing electronic health information:	
(a) Problems	
(1) Standard. The code set specified at 45 CFR 162.1002(a)(1) for the indicated conditions.	45 CFR 162.1002(a)(1). (1) *International Classification of Diseases, 9th Edition, Clinical Modification, (ICD–9–CM), Volumes 1 and 2* (including The Official ICD–9–CM Guidelines for Coding and Reporting), as maintained and distributed by HHS, for the following conditions: (i) Diseases. (ii) Injuries. (iii) Impairments. (iv) Other health problems and their manifestations. (v) Causes of injury, disease, impairment, or other health problems.
(2) Standard. International Health Terminology Standards Development Organization (IHTSDO) Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®) July 2009 version (incorporated by reference in §170.299).	
(b) Procedures.	

§170.205 Content exchange and implementation specifications for exchanging electronic health information.	Regulatory Referenced Standard
(1) Standard. The code set specified at 45 CFR 162.1002(a)(2).	45 CFR 162.1002(a)(2). (2) *International Classification of Diseases, 9th Edition, Clinical Modification, Volume 3 Procedures* (including The Official ICD–9–CM Guidelines for Coding and Reporting), as maintained and distributed by HHS, for the following procedures or other actions taken for diseases, injuries, and impairments on hospital inpatients reported by hospitals: (i) Prevention. (ii) Diagnosis. (iii) Treatment. (iv) Management.
(2) Standard. The code set specified at 45 CFR 162.1002(a)(5).	45 CFR 162.1002(a)(5). (5) The combination of *Health Care Financing Administration Common Procedure Coding System (HCPCS),* as maintained and distributed by HHS, and *Current Procedural Terminology, Fourth Edition (CPT–4),* as maintained and distributed by the American Medical Association, for physician services and other health care services. These services include, but are not limited to, the following: (i) Physician services. (ii) Physical and occupational therapy services. (iii) Radiologic procedures. (iv) Clinical laboratory tests. (v) Other medical diagnostic procedures. (vi) Hearing and vision services. (vii) Transportation services including ambulance.
(c) Laboratory orders and results	
Standard. Logical Observation Identifiers Names and Codes (LOINC®) version 2.27, when such codes were received within an electronic transaction from a laboratory (incorporated by reference in §170.299).	
(d) Medications	
Standard. Any source vocabulary that is included in RxNorm, a standardized nomenclature for clinical drugs produced by the United States National Library of Medicine.	

NORMATIVE TEST PROCEDURES

Derived Test Requirements

DTR170.306.f.1 – 1: Electronically Receive and Display HL7 CCD Patient Summary Record

DTR170.306.f.1 – 2: Electronically Receive and Display ASTM CCR Patient Summary Record

DTR170.306.f.2 – 1: Electronically Generate and Transmit HL7 CCD or ASTM CCR Patient Summary Record

DTR170.306.f.1 – 1: Electronically Receive and Display HL7 CCD Patient Summary Record

Required Vendor Information

VE170.306.f.1 - 1.01: Vendor shall provide communications configuration information and patient identifiers necessary to send test patient summary records in HL7 CCD format to the EHR

VE170.306.f.1 - 1.02: Vendor shall identify the EHR function(s) that are available to view an HL7 CCD formatted patient summary record in human readable format when received from an external source

Required Test Procedure

TE170.306.f.1 - 1.01: Tester shall select patient summary record data from NIST-supplied test data in TD170.306.f

TE170.306.f.1 - 1.02: Tester shall send the patient summary to the EHR

TE170.306.f.1 - 1.03: Using the EHR function(s) identified by the Vendor and the NIST-supplied Inspection Test Guide, the Tester shall display and verify that the patient summary record test data are received in the EHR, including

- Diagnostic test results
- Problem list
- Medication list
- Medication allergy list
- Procedure list

Inspection Test Guide

IN170.306.f.1 - 1.01: Using the data in the NIST-supplied Test Data TD170.306.f, Tester shall verify that the received patient summary record test data are complete, correct and viewable in the EHR in human readable format

DTR170.306.f.1 – 2: Electronically Receive and Display ASTM CCR Patient Summary Record

Required Vendor Information

VE170.306.f.1 - 2.01: Vendor shall provide communications configuration information and patient identifiers necessary to send test patient summary records in ASTM CCR format to the EHR

VE170.306.f.1 - 2.02: Vendor shall identify the EHR function(s) that are available to view an ASTM CCR formatted patient summary record in human readable format when received from an external source

Required Test Procedure

TE170.306.f.1 - 2.01: Tester shall select patient summary record data from NIST-supplied test data in TD170.306.f

TE170.306.f.1 - 2.02: Tester shall send the patient summary record in ASTM CCR format to the EHR

TE170.306.f.1 - 2.03: Using the EHR function(s) identified by the Vendor and the NIST-supplied Inspection Test Guide, the Tester shall display and verify that the patient summary record test data are received in the EHR, including

- Diagnostic test results
- Problem list
- Medication list
- Medication allergy list
- Procedure list

Inspection Test Guide

IN170.306.f.1 - 2.01: Using the data in the NIST-supplied Test Data TD170.306.f, Tester shall verify that the received patient summary record test data are complete, correct and viewable in the EHR in human readable format

DTR170.306.f.2 – 1: Electronically Generate and Transmit HL7 CCD or ASTM CCR Patient Summary Record

Required Vendor Information

VE170.306.f.2 – 1.01: Vendor shall identify the standard format they will use for this test (CCD or CCR)

VE170.306.f.2 – 1.02: Vendor shall identify a patient with an existing record in the EHR to be used for this test

VE170.306.f.2 – 1.03: Vendor shall identify the EHR function(s) available to 1) select the patient, 2) enter patient summary record data into the EHR, 3) send the patient summary record data from the EHR to an external system

Required Test Procedures

TE170.306.f.2 – 1.01: Tester shall select patient summary record test data from NIST-supplied test data in TD170.306.f

TE170.306.f.2 – 1.02: Using the EHR function(s) identified by the Vendor, the Tester shall select the patient's existing record and enter the patient summary record test data

TE170.306.f.2 – 1.03: Using the EHR function(s) identified by the Vendor, the Tester shall send the patient summary record in the vendor-selected format to a NIST-supplied test tool as described in the Conformance Test Tools section of this test procedure

TE170.306.f.2 – 1.04: Using the NIST-supplied test tool and the NIST-supplied Inspection Test Guide, the Tester shall verify that the patient summary record test data are transmitted correctly and without omission by the EHR, including

- Diagnostic test results
- Problem list
- Medication list
- Medication allergy list
- Procedure list

TE170.306.f.2 – 1.05: Using the EHR function(s) identified by the Vendor, the Tester shall transmit the Patient Summary Record to an external receiving system using the Vendor-identified transport technology of the EHR. The receiving system may either be a Tester's receiving system that is configurable to use the transport technology of the EHR system or module, or a Vendor-identified system capable of receiving from the EHR system or module

Inspection Test Guide

IN170.306.f.2 – 1.01: Using the data in the NIST-supplied Test Data TD170.306.f, Tester shall verify that the patient summary record test data are entered into the EHR correctly and without omission

IN170.306.f.2 – 1.02: Tester shall verify that all of the patient summary record test data are stored in the patient's record, including

- Diagnostic test results
- Problems
- Medications
- Medication allergies
- Procedures

IN170.306.f.2 – 1.03: Tester shall verify that the patient summary record test data are sent to the NIST-supplied test tool by the EHR

IN170.306.f.2 – 1.04: Using the NIST-supplied conformance testing tool identified in the Conformance Test Tools section of this test procedure, Tester shall verify that the transmitted patient summary record test data transmitted to the NIST-supplied test tool are complete and correct, and that the received test data are conformant to the referenced content (CCD or CCR) and vocabulary standards. The Tester shall verify that the medications source vocabulary values map correctly to the RxNorm values supplied in the NIST test data. The vocabulary verification may require manual inspection of the data.

IN170.306.f.2 – 1.05: Tester shall verify that the transmitted Patient Summary Record was received by the external receiving system based on the transport technology and configuration necessary to communicate with the EHRs systems

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 exist:

- 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 control 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.

The format of the test data below is for readability purposes in this Test Procedure only. It does not represent an implementation of the 'display in human readable format' requirement of this Test Procedure. It is not intended to represent 'human readable' per the Final Rule definition. The format used below does not place any requirements on an EHR module or system. There are no additional requirements for the meaning of 'human readable' beyond those articulated in the definition of 'human readable' referenced above.

TD170.306.f.: Exchange clinical information and patient summary record

* indicates alternative standard code per certification criteria

Patient Summary Record Test Data – Set #1

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Ann Toliver	07/16/1950 14:15:12	Female	989285998	Medical Record Number	353 Wine Street Flint, Michigan 48503 810-673-8378

"Source" for all data for this patient: Fatima Goyal, MD

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed
Diagnosis	428.0	Congestive Heart Failure	Active	02/22/2010
Diagnosis	410.90	Acute Myocardial Infarction	Resolved	09/16/2007

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed
Disorder	42343007	Congestive Heart Failure	Active	02/22/2010
Disorder	57054005	Acute Myocardial Infarction	Resolved	09/16/2007

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status
201372	Medication	captopril	Capoten	25 mg	Tablet	PO	TID	02/25/2010	Active
200820	Medication	spironolactone	Aldactone	25 mg	Tablet	PO	QID	02/25/2010	Active
309888	Medication	digoxin	Lanoxin	125 mcg	Tablet	PO	QD	02/25/2010	Active
628958	Medication	potassium chloride	Klor-Con	10 mEq	1 Tablet	PO	BID	02/25/2010	Active
198039	Medication	nitroglycerin	Nitroglycerin	400 mcg	1 Tablet	SL	As needed	09/20/2007	Active

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Recorded
Drug Allergy	293586001	Aspirin	Wheezing	03/02/2007
Drug Allergy	294506009	Ampicillin	Diarrhea, nausea, vomiting	04/25/1994

Diagnostic Test Results

Type	LOINC Code	Test (Normal Range)	Result	Date Performed
Imaging	24648-8	Chest X-ray, PA	Enlarged cardiac silhouette, lung fields clear	02/24/2010
Chemistry	2951-2	Sodium (135–146 mg/dl)	138 mg/dl	02/24/2010
Chemistry	2823-3	Potassium (3.5–5.3 mg/dl)	4.3 mg/dl	02/24/2010
Chemistry	2075-0	Chloride (95-107 mEq/L)	98 mEq/L	02/24/2010
Imaging	24648-8	Chest X-ray, PA	Enlarged cardiac silhouette, horizontal lines in the periphery of lower posterior lung fields	02/22/2010
Chemistry	2951-2	Sodium (135–146 mg/dl)	126 mg/dl	02/22/2010
Chemistry	2823-3	Potassium (3.5–5.3 mg/dl)	3.0 mg/dl	02/22/2010
Chemistry	2075-0	Chloride (95-107 mEq/L)	94 mEq/L	02/22/2010

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed
Cardiac	00.66	Percutaneous transluminal coronary angioplasty	Completed	09/17/2007
Cardiac	37.21	Cardiac catheterization	Completed	10/01/2006

Type	CPT Code*	Procedure	Status	Date Performed
Cardiac	92982	Percutaneous transluminal coronary angioplasty	Completed	09/17/2007
Cardiac	93501	Cardiac catheterization	Completed	10/01/2006

Patient Summary Record Test Data – Set #2

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Ruth Warholde	05/20/1954 23:59:45	Female	9836469798	Medical Record Number	225 Park Street Morton, Illinois 61550 309-354-9385

"Source" for all data for this patient: Jackson Shoals, MD

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed
Diagnosis	780.2	Syncope and collapse, vasovagal attack	Active	02/15/2010
Diagnosis	434.91	Cerebrovascular Accident (Stroke)	Resolved	07/09/2009
Diagnosis	599.0	Urinary tract infection	Recurrent	09/22/2008
Diagnosis	496.0	Chronic Obstructive Pulmonary Disease	Chronic	08/12/2007
Symptom	401.9	Hypertension, essential	Chronic	05/16/2006

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed
Disorder	398665005	Vasovagal syncope	Active	02/15/2010
Disorder	230690007	Cerebrovascular Accident (Stroke)	Resolved	07/09/2009
Disorder	197927001	Recurrent urinary tract infection	Recurrent	09/22/2008
Disorder	13645005	Chronic Obstructive Lung Disease	Chronic	08/12/2007
Disorder	59621000	Essential Hypertension	Chronic	05/16/2006

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status
209834	Medication	docusate	Colace	100 mg	1 Capsule	PO	BID	02/16/2010	Active
205326	Medication	lisinopril	Zestril	30 mg	1 Tablet	PO	QD	07/15/2009	Active
309362	Medication	clopidogrel	Plavix	75 mg	1 Tablet	PO	QD	07/15/2009	Active
197361	Medication	amlodipine	Norvasc	5 mg	1 Tablet	PO	QD	07/15/2009	Active
539712	Medication	nitrofurantoin	Macrobid	100 mg	1 Capsule	PO	QD	09/22/2008	No Longer Active
836370	Medication	ipratropium bromide monhydrate	Atrovent inhaler	18 mcg/puff	2 puffs	By oral inhalation	QID	08/14/2007	Active
884175	Medication	Catapres	clonidine hydrochloride	0.1 mg	1 Tablet	PO	BID	05/16/2006	Active

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Recorded
Drug Allergy	293620004	Indomethacin	Nausea, vomiting, rash, dizziness, headache	03/25/2003
Drug Allergy	91939003	Sulfonamides	Hives, photosensitivity	07/26/1999

Diagnostic Test Results

Type	LOINC Code	Test (Normal Range)	Result	Date Performed
Imaging	11539-4	CT, head	Small high right occipital lobe contusion. No evidence of extra-axial blood. Significant sinus disease.	02/24/2010
Hematology	718-7	Hemoglobin (male: 14-18 g/dl female: 12-16 g/dl)	13 g/dl	02/17/2010
Hematology	4544-3	Hematocrit (male: 40-54% female: 36-48%)	38%	02/17/2010
Chemistry	2951-2	Sodium (135–146 mg/dl)	136 mg/dl	02/17/2010
Chemistry	2823-3	Potassium (3.5–5.3 mg/dl)	3.9 mg/dl	02/17/2010
Imaging	34534-8	Electrocardiogram	Normal Sinus Rhythm	02/15/2010
Microbiology	630-4	Urine culture, routine (Negative: No growth Positive: >10,000 CFU/ml)	Negative: No growth	10/02/2008

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed
Surgical	66.39	Bilateral tubal ligation	Completed	06/14/1990

Type	CPT Code*	Procedure	Status	Date Performed
Surgical	58600	Bilateral tubal ligation	Completed	06/14/1990

Patient Summary Record Test Data – Set #3

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Lorraine Blevins	04/16/1957 20:15:35	Female	967385998	Medical Record Number	1020 Stuart Street Morton, Illinois 61550 309-374-8938

"Source" for all data for this patient: Louis Randolph, MD

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed
Diagnosis	715.35	Right hip osteoarthritis	Resolved	02/12/2010
Finding	414.01	Coronary Artery Disease (CAD)	Chronic	05/05/2002

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed
Disorder	239872002	Right hip osteoarthritis	Resolved	02/12/2010
Disorder	53741008	Coronary Arteriosclerosis	Chronic	05/05/2002

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status
855320	Medication	warfarin	Coumadin	3 mg	1 Tablet	PO	QD	02/15/2010	Active
209613	Medication	bisacodyl	Dulcolax	5 mg	1 Tablet	PO	QD	02/15/2010	Active
309362	Medication	clopidogrel	Plavix	75 mg	1 Tablet	PO	QD	05/15/2002	Active
197361	Medication	amlodipine	Norvasc	5 mg	1 Tablet	PO	QD	07/15/2009	Active

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Recorded
Drug Allergy	91939003	Sulfonamides	Hives, photosensitivity	06/06/1998
Drug Allergy	294506009	Ampicillin	Diarrhea, nausea, vomiting	04/25/1994

Diagnostic Test Results

Type	LOINC Code	Test (Normal Range)	Result	Date Performed
Imaging	37721-8	X-ray, 2 views, Right Hip	Subchondral sclerosis, increased density in subchondral bone	02/12/2010
Imaging	24648-8	Chest X-ray, PA	No disease is seen in the lung fields or pleura	06/05/2009
Hematology	718-7	Hemoglobin (male: 14-18 g/dl female: 12-16 g/dl)	11.2 g/dl	06/05/2009
Hematology	4544-3	Hematocrit (male: 40-54% female: 36-48%)	34%	06/05/2009

Type	LOINC Code	Test (Normal Range)	Result	Date Performed
Coagulation	34714-6	Prothrombin Time/ International Normalized Ratio (PT/INR) (2.5 – 3.5)	3.1	06/05/2009

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed
Surgical	81.51	Total Hip Replacement, Right	Completed	02/14/2010
Cardiac	37.21	Cardiac catheterization	Completed	05/05/2002

Type	CPT Code*	Procedure	Status	Date Performed
Surgical	27130	Total Hip Replacement, Right	Completed	02/14/2010
Cardiac	93501	Cardiac catheterization	Completed	05/05/2002

Patient Summary Record Test Data – Set #4

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Paul Jackson	03/08/1962 14:25:50	Male	998777349	Medical Record Number	754 Samuel Street, Blanchard, Oklahoma 73010 405-228-9292

"Source" for all data for this patient: Mary Pfiffer, MD

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed
Diagnosis	410.90	Acute Myocardial Infarction	Resolved	07/12/2010
Finding	414.01	Coronary Artery Disease (CAD)	Chronic	07/05/2000

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed
Disorder	57054005	Acute Myocardial Infarction	Resolved	07/12/2010
Disorder	53741008	Coronary Arteriosclerosis	Chronic	07/05/2000

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status
198039	Medication	nitroglycerin	Nitroglycerin	400 mcg	1 Tablet	SL	As needed	07/15/2010	Active
309362	Medication	clopidogrel	Plavix	75 mg	1 Tablet	PO	QD	07/05/2000	Active
197361	Medication	amlodipine	Norvasc	5 mg	1 Tablet	PO	QD	07/05/2000	Active

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Recorded
Drug Allergy	91936005	Penicillin	Rash and anaphylaxis	07/12/2010
Drug Allergy	294506009	Ampicillin	Diarrhea, nausea, vomiting	03/28/2000

Diagnostic Test Results

Type	LOINC Code	Test (Normal Range)	Result	Date Performed
Chemistry	14647-2	Total cholesterol (<200 mg/dl)	220 mg/dl	07/15/2010
Chemistry	14927-8	Triglycerides (<150 mg/dl)	165 mg/dl	07/15/2010
Imaging	42272-5	Chest X-ray, PA & Lateral	The heart outline is slightly enlarged, the hilar and mediastinal vessels are of normal appearance	07/15/2010
Hematology	718-7	Hemoglobin (male: 14-18 g/dl female: 12-16 g/dl)	12.8 g/dl	2/18/2010
Hematology	4544-3	Hematocrit (male: 40-54% female: 36-48%)	44%	2/18/2010

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed
Cardiac	00.66	Percutaneous transluminal coronary angioplasty	Completed	07/15/2010

Type	CPT Code*	Procedure	Status	Date Performed
Cardiac	92982	Percutaneous transluminal coronary angioplasty	Completed	07/15/2010

Patient Summary Record Test Data – Set #5

Patient

Name	Date/Time of Birth	Gender	Identification Number	Identification Number Type	Address/Phone
Christine Taylor	09/22/1965 16:48:25	Female	9787478034	Medical Record Number	754 Angel Street Marshalltown Iowa 50158 641-544-9988

"Source" for all data for this patient: Kathryn Thomson, MD

Problem List

Type	ICD-9 Code	Patient Problem	Status	Date Diagnosed
Diagnosis	540.0	Acute Appendicitis	Resolved	01/09/2010
Diagnosis	434.91	Cerebrovascular Accident (Stroke)	Resolved	07/09/2009
Diagnosis	250.02	Diabetes Mellitus, Type 2	Active	03/30/2009
Symptom	401.9	Hypertension, Essential	Chronic	02/25/2008

Type	SNOMED Code*	Patient Problem	Status	Date Diagnosed
Disorder	74400008	Appendicitis	Resolved	01/09/2010
Disorder	230690007	Cerebrovascular Accident (Stroke)	Resolved	07/09/2009
Disorder	44054006	Diabetes Mellitus, Type 2	Active	03/30/2009
Disorder	59621000	Essential Hypertension	Chronic	02/25/2008

Medication List

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status
309362	Medication	clopidogrel	Plavix	75 mg	1 Tablet	PO	QD	07/15/2009	Active
205875	Medication	glyburide	Diabeta	2.5 mg	1 Tablet	PO	Q AM	03/30/2009	Active
209834	Medication	docusate	Colace	100 mg	1 Capsule	PO	BID	03/30/2009	Active
200801	Medication	furosemide	Lasix	20 mg	1 Tablet	PO	BID	02/25/2008	Active
628958	Medication	potassium chloride	Klor-Con	10 mEq	1 Tablet	PO	BID	02/25/2008	Active

RxNorm Code	Product	Generic Name	Brand Name	Strength	Dose	Route	Frequency	Date Started	Status
884175	Medication	Catapres	clonidine hydrochloride	0.1 mg	1 Tablet	PO	BID	02/25/2008	Active

Medication Allergy List

Type	SNOMED Code	Medication/Agent	Reaction	Date Recorded
Drug Allergy	293620004	Indomethacin	Rash, dizziness, headache	06/05/2008
Drug Allergy	294506009	Ampicillin	Diarrhea, nausea, vomiting	05/25/1997
Drug Allergy	91939003	Sulfonamides	Hives, photosensitivity	08/25/1989

Diagnostic Test Results

Type	LOINC Code	Test (Normal Range)	Result	Date Performed
Chemistry	14771-0	Fasting Blood Glucose (70–100 mg/dl)	126 mg/dl	07/15/2010
Chemistry	2823-3	Potassium (3.5–5.3 mg/dl)	4.3 mg/dl	07/15/2010
Chemistry	14927-8	Triglycerides (<150 mg/dl)	178 mg/dl	07/15/2010
Imaging	42272-5	Chest X-ray, PA & Lateral	The heart outline is normal and the hilar and mediastinal vessels are of normal appearance	02/25/2008

Procedure List

Type	ICD-9 Code	Procedure	Status	Date Performed
Surgical	47.09	Emergency Appendectomy	Completed	01/09/2010

Type	CPT Code*	Procedure	Status	Date Performed
Surgical	44950	Emergency Appendectomy	Completed	01/09/2010

CONFORMANCE TEST TOOLS

The following testing tools are available to evaluate conformance to the standards referenced in this test procedure:

- HL7 CCD/HITSP C32 – NIST provides an HL7 CCD/HITSP C32 validation tool designed specifically to support this test procedure. The tool is available in two forms:
    - a downloadable package for local installation available at http://xreg2.nist.gov/cda-validation/mu.html
    - a web-accessable validator which is hosted by NIST available at http://xreg2.nist.gov/cda-validation/mu.html

Support for these tools is available by contacting

Andrew McCaffrey (andrew.mccaffrey@nist.gov)
Computer Scientist
National Institute of Standards and Technology (NIST)
Information Technology Laboratory

- ASTM CCR – Open Health Data provides an ASTM CCR validation tool designed specifically to support this test procedure. The tool is available through the following:
    - Files can be retrieved from the SourceForge site: http://sourceforge.net/projects/ccrvalidator
    - Direct link to the file: http://sourceforge.net/projects/ccrvalidator/files/ValidationService/1.0/ValidationService-1.0.war/download
    - Source code location: http://ccrvalidator.svn.sourceforge.net/viewvc/ccrvalidator/branches/

- HL7 CCD style sheet – HL7 provides a style sheet to render HL7 CCD structured documents as part of the CCD specifications package. Contact HL7 directly for the specification package.

The following information is provided to assist the Tester in interpreting the conformance reports generated by the NIST conformance testing tools.
The HL7 CCD/HITSP C32 and ASTM CCR validation tools evaluate individual conformance statements which have been derived from the standards and implementation guides identified in the Final Rule and the test data provided in this test procedure. The validation tools evaluate the submitted CCD/CCR instance for each conformance statement, and then produce a conformance report. The Tester should consider that a report containing only Affirmative and Warning messages indicates general conformance to the standard and test data expectations. If reported, Errors should be considered as significant departures from the standard or test data requirements which need to be corrected in order to claim conformance. ATCBs will need to further analyze each error to determine if, in the context of meeting the criterion and overall meaningful use objective, the error results in a failure of the Test Procedure by the EHR technology. The tester may need to inspection test data values derived from required vocabularies and code sets.

Document History

Version Number	Description	Date Published
0.5	Original draft version	April 9, 2010
1.0	Updated to reflect Final Rule	July 21, 2010
1.0	Updated to remove “Pending” from header	August 13, 2010