

Electronic Health Record Technology Test Scenario Based Test Script

Inpatient Scenario



Office of Testing and Certification

Version	Date	Status/Changes	Authors
1.0	7/16/12	Initial Draft	C.P. Brancato
1.1	7/23/12	IWG Updates (Note: this scenario will be discussed during the 7/25/12 IWG meeting)	L. McCue

DRAFT

Scenario Based Test Case Script

Purpose:

The purpose of the scenario based test script is to test the Electronic Health Record in a manner that reflects a typical clinical workflow to ensure that as the required data is collected, it remains “threaded” meaning pertinent and persistent throughout the entirety of each certification criterion tested.

By way of example:

If information is collected and appears on a patient’s problem list (170.302.(c); Maintain an up-to-date-problem list), it is expected that the same information will be available and used by the EHR to generate a patient reminder list (170.304(d); Patient Reminders). It is expected that the vendor demonstrate a “one-to-one” match using the test data contained in the EHR that is being tested.

The scenario is not intended to be an exact reproduction of any one provider’s clinical workflow. It is recognized that clinical work flows are highly personal and unique for each medical practice.

Test Methodology:

Testing is performed in a sequence of iterative steps to completed one after another to match the workflow described. At the end of the sequence and scenario, the EHR would have demonstrated its ability to perform to both the scenario sequence and the individual certification criteria tested during that scenario sequence.

The scenario based testing sequence will assume that:

- The person accessing the system is the person authorized to perform the specified action to be tested in accordance with the certification criteria contained in the Final Rule regardless if vendor or test lab personnel are accessing the system. E.g., for electronic prescribing, the actor will assume the role of the Eligible Provider authorized to perform that function. The software being tested must be able to demonstrate that the appropriate rights and permissions are afforded to the user based on their role.
- The actor must complete both the entire sequence and the specific test procedure for the criterion being tested in order to complete the test.

Pre-conditions:

This scenario is a typical workflow that occurs at an Eligible Providers site of care. There are a variety of actors and interactions throughout the sequence.

Certification Criteria Tested:

(For example only. This to be updated to Stage 2 criteria and test procedures, when final)

The scenario will test the following certification criteria:

Certification Criterion Citation	Criterion Description	URL to Criterion Test Procedure
170.302(a)	Drug-Drug, Drug-allergy interaction checks	http://healthcare.nist.gov/docs/170.302.a_DrugDrugDrugAllergy_v1.0.pdf
170.302(b)	Drug Formulary Checks	http://healthcare.nist.gov/docs/170.302.b_DrugFormularyChecks_v1.0.pdf
170.302(c)	Maintain up-to-date problem list	http://healthcare.nist.gov/docs/170.302.c_problemelist_v1.0.pdf
170.302(d)	Maintain Active Medication List	http://healthcare.nist.gov/docs/170.302.e_allergylist_v1.0.pdf
1703.302(e)	Maintain Active Medication Allergy List	http://healthcare.nist.gov/docs/170.302.e_allergylist_v1.1.pdf
170.302(f)(1)	Vital Signs	http://healthcare.nist.gov/docs/170.302.f.1_vitalsigns_v1.0.pdf
170.314(a)(9)	Electronic Note	TBD
170.302(g)	Smoking Status	http://healthcare.nist.gov/docs/170.302.g_smokingstatus_v1.0.pdf
170.302(h)	Incorporate Lab Results	http://healthcare.nist.gov/docs/170.302.h_IncorporateLabTest_v1.0.pdf
170.302(i)	Generate Patient List	http://healthcare.nist.gov/docs/170.302.i_GeneratePatientLists_v1.0.pdf
170.302(j)	Medication Reconciliation	http://healthcare.nist.gov/docs/170.302.j_20MedicationReconciliation_v1.0.pdf
170.302(m)	Patient Specific Education Resources	http://healthcare.nist.gov/docs/170.302.m_EducationResources_v1.0.pdf
170.302(o)	Access Control	http://healthcare.nist.gov/docs/170.302.o_AccessControl_v1.0.pdf
1703.302(q)	Automatic Log Off	http://healthcare.nist.gov/docs/170.302.q_AutomaticLogOff_v1.0.pdf
170.302(t)	Authentication	http://healthcare.nist.gov/docs/170.302.t_Authentication_v1.0.pdf
170.304(e)	Electronic Prescribing	http://healthcare.nist.gov/docs/170.304.b_ExchangePrescriptionInformation_v1.0.pdf
170.304(c)	Record Demographics	http://healthcare.nist.gov/docs/170.304.c_RecordDemographicsAmb_v1.0.pdf
170.304(e)	Clinical Decision Support	http://healthcare.nist.gov/docs/170.304.e_ClinicalDecisionSupportAmb_v1.0.pdf
170.306(d)(1)	Electronic Copy of Health Information	http://healthcare.nist.gov/docs/170.306.d.1_ElectronicCopyOfHealthInformation_v1.0.pdf
170.304(f)	Exchange of clinical information and patient summary record	http://healthcare.nist.gov/docs/170.306.f_ExchangeClinicalInfoSummaryRecordIP_v1.0.pdf

170.306(h)	Advance directives	http://healthcare.nist.gov/docs/170.306.h_Adv Directives_v1.0.pdf
170.314(a)(17)	Electronic Medication Administration record (eMAR)	TBD
170.314(b)(4)	Clinical Information Reconciliation	TBD
170.314(f)(6)	Transmission of electronic laboratory tests and values/results to ambulatory providers	TBD
170.314(e)(1)	View, Download and transmit to 3 rd Party	TBD
170.306(a)	Computerized Provider Order Entry	http://healthcare.nist.gov/docs/170.306.a_CP OEIP_v1.1.pdf
170.314(a)(12)	Imaging	TBD
170.314(a)(13)	Family Health History	TBD
170.314(b)(1)	Transitions of Care	TBD
170.314(b)(2)		
170.314(b)(5)	Incorporate lab tests and values/results	TBD
170.314(b)(6)	Transmission of electronic laboratory tests and values/results to ambulatory providers	TBD

Scenario Assumptions:

{Note: the inpatient scenario could theoretically be threaded from outputs from an outpatient test scenario sequence. Must consider the feasibility of running a long and possibility redundant test sequence across multiple systems}

The site of service is a typical Critical Access Hospital (CAH). The CAH has applied for EHR incentive funds and has installed or is using a certified EHR product.

Comment [EM1]: [J. Heyman] Generally, CAHs do not have hospitalists.

The users of the system include:

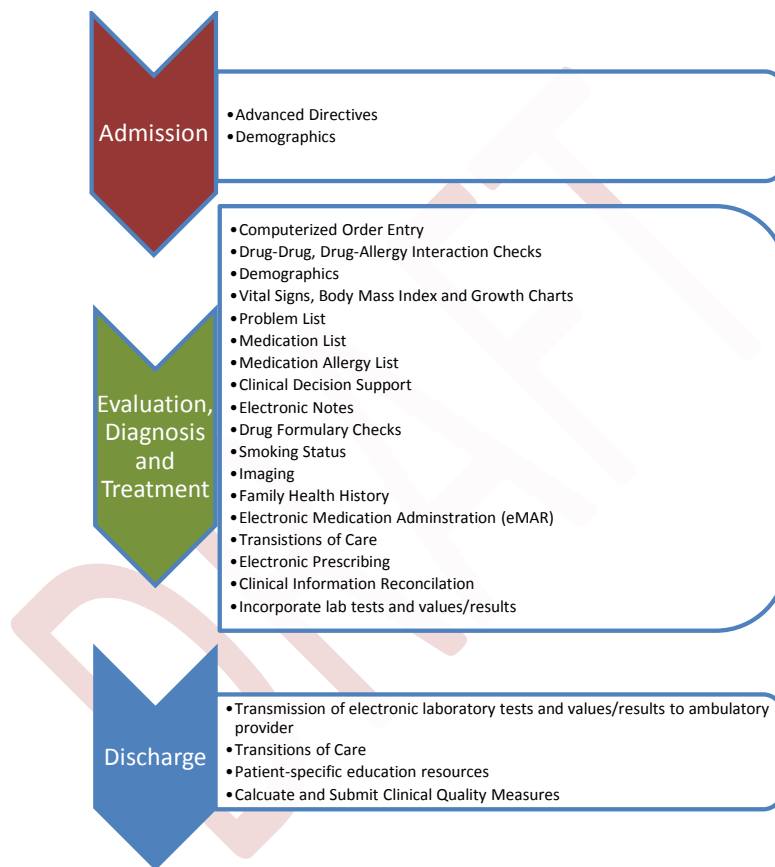
- Administrative personnel
- Non-licensed clinical personnel
- Licensed eligible providers as defined by the CMS EHR Incentive Program, Interim Final Rule

The adult patient is to be admitted to a typical general medicine acute care unit through the hospitals registration office, not the Emergency Department, for general signs and symptoms requiring inpatient admission for evaluation leading to diagnosis and treatment.

The scenario will follow the patient through a variety of care settings within the hospital as they are cared for by numerous providers within the hospital until discharge to home.

Work Flow:

This scenario assumes a work flow that is categorized in three iterative phases: admission, evaluation and treatment and discharge from the hospital. In each phase, personnel will use the EHR to collect, reconcile and report clinical information the details of which are included in each of the specific test procedures associated with the clinical action.



Admissions Scenario:

Upon the order of a primary care physician, the patient is admitted to the hospital with symptoms which appear to be related to adult onset Diabetes. The provider has provided the following information to the hospital:

- Past medical history to include problems, treatments, illnesses and surgeries.
- General health history to include smoking status

- Family medical history
- List of implantable or external medical devices, if any
- An active medication list/inventory which include medications the patient is currently prescribed by the provider as well as medications prescribed by other providers, if any. The list may include response and efficacy to treatment.
- A past medication history to include medications that the patient is no longer taking, has discontinued on their own or on medical advice, effects and side-effects.
- Know drug, food or environmental allergies
- Consents, power of attorney, and advanced directives

This information is carried with the patient until they are admitted to the nursing unit.

Upon arrival at the admissions office, the administrative person at the window provides the patient with forms to fill out which include demographic information to include name, date of birth, preferred language, gender and with the patient's permission, race and ethnicity in addition to other information.

The admissions person asks to see some form of identification and an insurance card, if the patient has insurance. In this scenario, the patient provides a current Medicare card. The information from these sources is entered into the admissions software application and is automatically imported into the hospital's Certified EHR for clinical use. Two hospital identification bands are provided and placed on the patient. A patient transportation person arrives to transport the patient to the patient care unit. The employee identifies the patient using both the paperwork they are provided by the admissions and perform a visual match to the identification band to ensure they are transporting the correct patient.

Evaluation, Diagnosis and Treatment Scenario:

Upon arrival at the patient care unit, the transporter provides information to the unit administrative person who reviews it. The nurse in charge of the unit has assigned the patient a room before the patient arrives and the unit administrative coordinator directs the transporter to that room while notifying the nurse who will care for that patient for the rest of the shift.

The nurse identifies the patient using the same technique the transporter used to ensure the correct patient is being cared for and begins to the nursing assessment.

Before admission, the referring provider has electronically transmitted a comprehensive summary of care record which was imported into the hospital's EHR. The nurse verifies the information during her assessment and reconciles any discrepancies using the functionality available in the EHR.

During the nursing assessment, the nurse collects the following information:

- As part of the nursing assessment, the nurse reviews with the patient the information provided by the referring physician which includes:
 - Past medical history to include problems, treatments, illnesses and surgeries.
 - General health history to include smoking status

Comment [EM2]: [J. Heyman] I would assume that the outpatient referring physician is likely to be the same physician caring for the patient as an inpatient. This would be true for any surgical or obstetrical patient and more likely for a medical patient.

Comment [EM3]: [J. Heyman] In any of these scenarios, the note is much more valuable than the CCR as it appears to imply in the bulleted list the nurse is using on admission.

Comment [EM4]: [J. Heyman] The physician who sends the patient to the hospital for admission is likely to have done the history and physical (H&P) in his/her office.

- Family medical history
- List of implantable or external medical devices, if any
- An active medication list/inventory which include medications the patient is currently prescribed by the provider as well as medications prescribed by other providers, if any. The list may include response and efficacy to treatment.
- A **past medication history** to include medications that the patient is no longer taking, has discontinued on their own or on medical advice, effects and side-effects.
- Know drug, food or environmental allergies
- Consents, power of attorney, and advanced directives
- Psycho-social evaluation
- Physical exam to include:
 - Vitals signs to include, at minimum, height, weight, and blood pressure.

Comment [EM5]: [J. Heyman] It is one thing if an EMR keeps a list of all previous meds entered, but I know few physicians who ask a Medicare patient to tell them all the medications he/she can remember using in the past.

After completing the nursing assessment, the nurse inputs the information gathered from the patient, the referring physician and the nursing assessment into the EHR. The nurse activates any standing order sets using the Computerized Provider Order Entry functionality as per the hospital protocols.

The nurse contacts the physician that the patient has arrived on the unit and if there are any additional orders at this time. The physician relays a verbal order to the nurse and prescribes all the medications that the patient uses to maintain their health and wellness while outside the hospital. The nurse enters those orders into the EHR.

The physician arrives shortly to see the patient and reviews the information from both the nurse and the referring physician with the patient. After review, the physician performs a physical exam which includes a review of all physical systems of the patient.

Once completed, the physician enters in his clinical note into the EHR and activates the Clinical Decision Support functionality contained in the EHR then selects the national clinical guideline for Diabetes and performs the following based on the guideline recommendations:

Comment [EM6]: [J. Heyman] The physician might dictate the note from his/her office to the hospital over the phone, or could electronically send the note or fax it.

- Discontinued several medications, adjusted the dose and route of administration of several others establishing new orders for several others.
 - The EHR automatically checks the following and alerts the provider if:
 - The patient has a known allergy to the medications ordered
 - Is already on the medication in some form
 - The medication would have interactions with other drugs and could possibly cause harm to the patient
 - The dosage and route of administration are incorrect against accepted practice
 - The medication is not currently on the hospital's drug formulary.
- Orders a panel of laboratory tests
- Orders several tests to be performed by the Radiology Department.
- Orders a consult for the Endocrinology specialist to evaluate the patient for Diabetes.
- Enters dietary, activities of daily living and other restrictions

The nurse who is caring for the patient accesses the EHR and reviews the orders and acts upon them as appropriate while documenting in the EHR that the order has been received and completed.

Through the EHR, the laboratory technician receives the order to take the blood samples required for the laboratory tests the physician ordered. Once the samples are evaluated and the data is imported into the Laboratory Information System, it is exported and made available to the hospital's EHR.

As medications arrive on the nursing unit, the nurse reviews the medication administration schedule for the patient and administers the medication per the physician order. Before administering, the nurse performs the following:

- Identifies the patient as per hospital protocol
- Verifies that the medication is identified for the patient and that the medication matches the original order
- Verifies that the dose matches the medication order
- Verifies the route of administration matches the order.

After performing these checks, the medication is administered and recorded as such in the EHR.

Both the hospital laboratory and radiology systems have provided the test results and interpretations to the hospital's EHR.

The Endocrinologist received the consult through the EHR evaluates the patient, reviews both the laboratory results and radiographic interpretations and documents an electronic note in the EHR and proceeds to adjust the patient's medication orders and recommends the patient be discharged from the hospital to home the following day.

Discharge:

The provider orders that the hospital's diabetes educator see the patient and provide the appropriate educational materials before the patient is discharged. The educator uses the EHR to search for on line educational material selected by information contained in the EHR.

Once the patient is discharged from the hospital and final charting has been completed, the hospital's EHR generates and sends a "summary of care record" to the referring provider.