Electronic Health Record Technology Test Scenario Based Test Script

Medication Management

Office of Testing and Certification

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, is 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 rule 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 as it applies to the specific software tested and the specific test procedure for each individual applicable criterion being tested in order to complete the test.

Pre-conditions:

This scenario is a typical workflow for the management of medications using an EHR in Critical Access Hospital.

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
170.314(a)(2)	Drug-Drug, Drug-allergy interaction checks	http://healthcare.nist.gov/docs/170.302.a_DrugDrugDrugAllergy_v1.0.pdf **(2011 Ed.)**
170.314(a)(6)	Medication List	http://healthcare.nist.gov/docs/170.302.e_allergylist_v1.0.pdf **(2011 Ed.)**
170.314(a)(7)	Medication Allergy List	http://healthcare.nist.gov/docs/170.302.e_allergylist_v1.1.pdf **(2011 Ed.)**
170.314(a)(8)	Clinical Decision Support	http://healthcare.nist.gov/docs/170.304.e_ClinicalDecisionSupportAmb_v1.0.pdf **(2011 Ed.)**
170.314(a)(10)	Drug Formulary Checks	http://healthcare.nist.gov/docs/170.302.b_DrugFormularyChecks_v1.0.pdf **(2011 Ed.)**
170.314(a)(15)	Patient Specific Education	http://healthcare.nist.gov/docs/170.302.m_EducationResources_v1.0.pdf **(2011 Ed.)**
170.314(a)(16)	Electronic Medication Administration record (eMAR)	TBD
170.314(b)(3)	Electronic Prescribing	http://healthcare.nist.gov/docs/170.304.b_ExchangePrescriptionInformation_v1.0.pdf **(2011 Ed.)**
170.314(b)(4)	Clinical Information Reconciliation	http://healthcare.nist.gov/docs/170.302.j_%20MedicationReconciliation_v1.0.pdf **(2011 Ed.)**

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

The users of the system include:

- Licensed eligible providers as defined by the CMS EHR Incentive Program, Interim Final Rule to include the nursing staff, pharmacy staff and physicians.

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 clinical workflow from ordering to administration of a medication through the variety of hospital departments in the care setting. The goal of the test is to ensure that the EHR system is capable of using and maintaining the accuracy of the medications from one test through another without error or loss of fidelity.
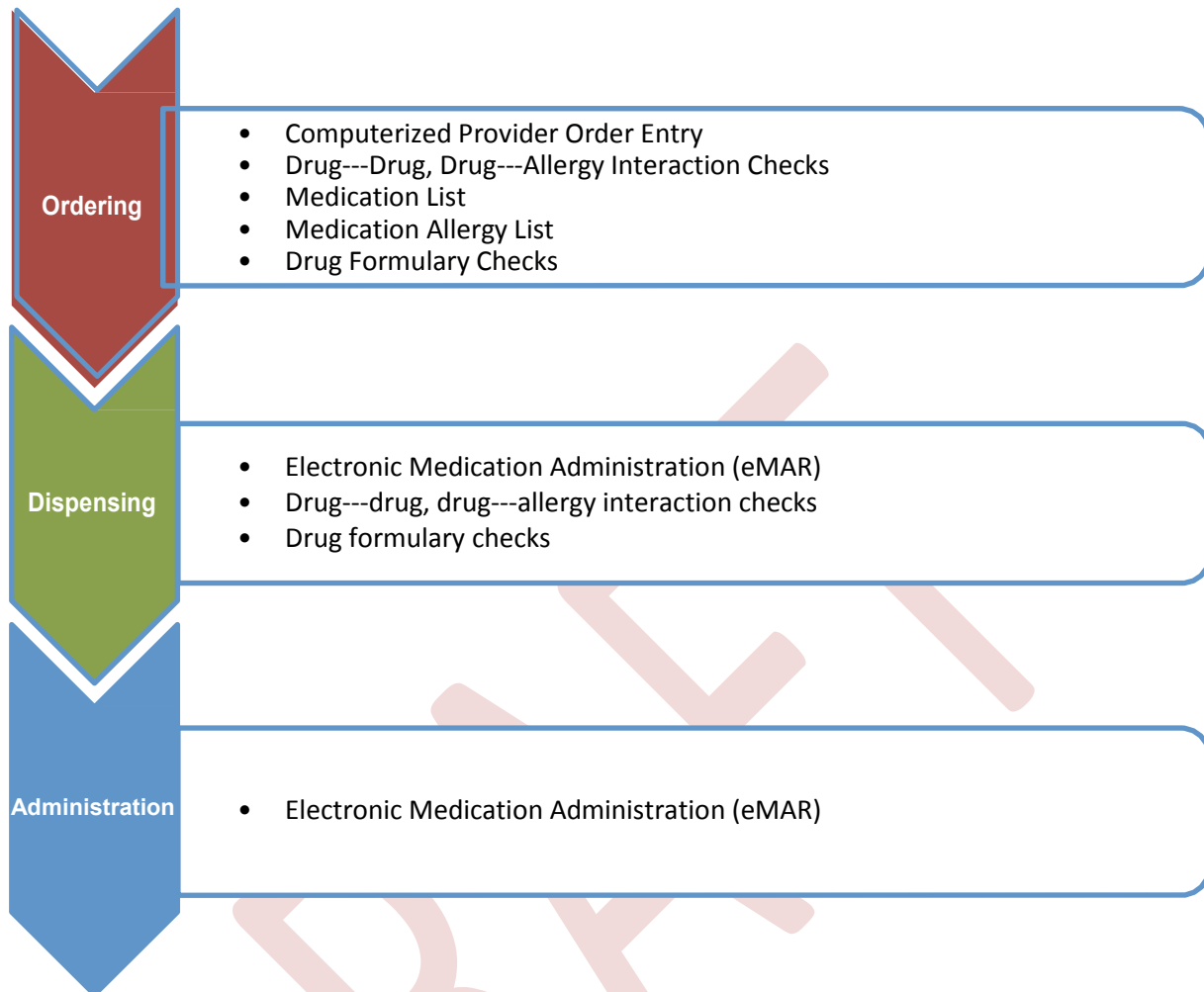
Work Flow:

This scenario assumes a work flow that is categorized in three iterative phases:

1. Ordering
2. Dispensing
3. Administration of a medication.

While multiple clinical systems are in use by a typical hospital, this scenario assumes, the EHR contains the all the functionality necessary for certification and will be the only system used by the clinicians and tested as such.

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.

Ordering
- Computerized Provider Order Entry
- Drug---Drug, Drug---Allergy Interaction Checks
- Medication List
- Medication Allergy List
- Drug Formulary Checks

Dispensing
- Electronic Medication Administration (eMAR)
- Drug---drug, drug---allergy interaction checks
- Drug formulary checks

Administration
- Electronic Medication Administration (eMAR)

Note: The bullets within each phase do not indicate sequence. Rather, each bullet must be satisfied within the relative phase.

Pre-Conditions:

This scenario assumes that the EHR contains the following sets of data as defined by the Standards, Implementation Guidance and Certification Criteria, Interim Final Rule.

- A problem list
- An active medication list
- A current medication allergy list
- A current drug formulary list

Ordering Phase:

As a result of the provider using the EHRs Clinical Decision Support functionality, he/she selects several medications appropriate to the disease process. In addition, the provider orders additional medications not included in the order set.

The EHR automatically performs a safety check and compares the medications entered against the up to date medication list. The system also performs a safety check comparing the medications ordered and the patient's medication allergy list by performing a drug-allergy check. If any contraindications were found, the EHR alerts the provider so appropriate intervention can be taken before finalizing the medication order.

The EHR performs a comparison of the medications ordered against the hospital's drug formulary to identify the medications are contained in the formulary and their drug preference.

Once completed, the provider places the order electronically to be used by the hospital pharmacy.

Dispensing Phase:

The EHR alerts the pharmacy that medication orders have arrived for dispensing. The order is reviewed and additional safety checks are performed. Pharmacy personnel or robotic dispensing equipment select the correct drug in the formulation as ordered. The orders are verified by pharmacy staff for accuracy. The medications are noted as dispensed in the EHR and delivered to the unit for administration.

Administration Phase:

As medications arrive o the nursing unit, the nurse reviews the medication administration schedule for the patient using the EHR verifying that the patient is to receive the medication according to the medication schedule. Before administering, the nurse uses the EHR's assistive functionality and performs the following other checks:

- 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 timing of administrations matches the order
- Verifies the route of administration matches the order

Note that patient and medication identification are usually the first two checks; however, the remaining three can be completed in no particular order.

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