

# 2014 Edition Test Scenarios

*Revised February 22, 2013*



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# Unit-Based Testing

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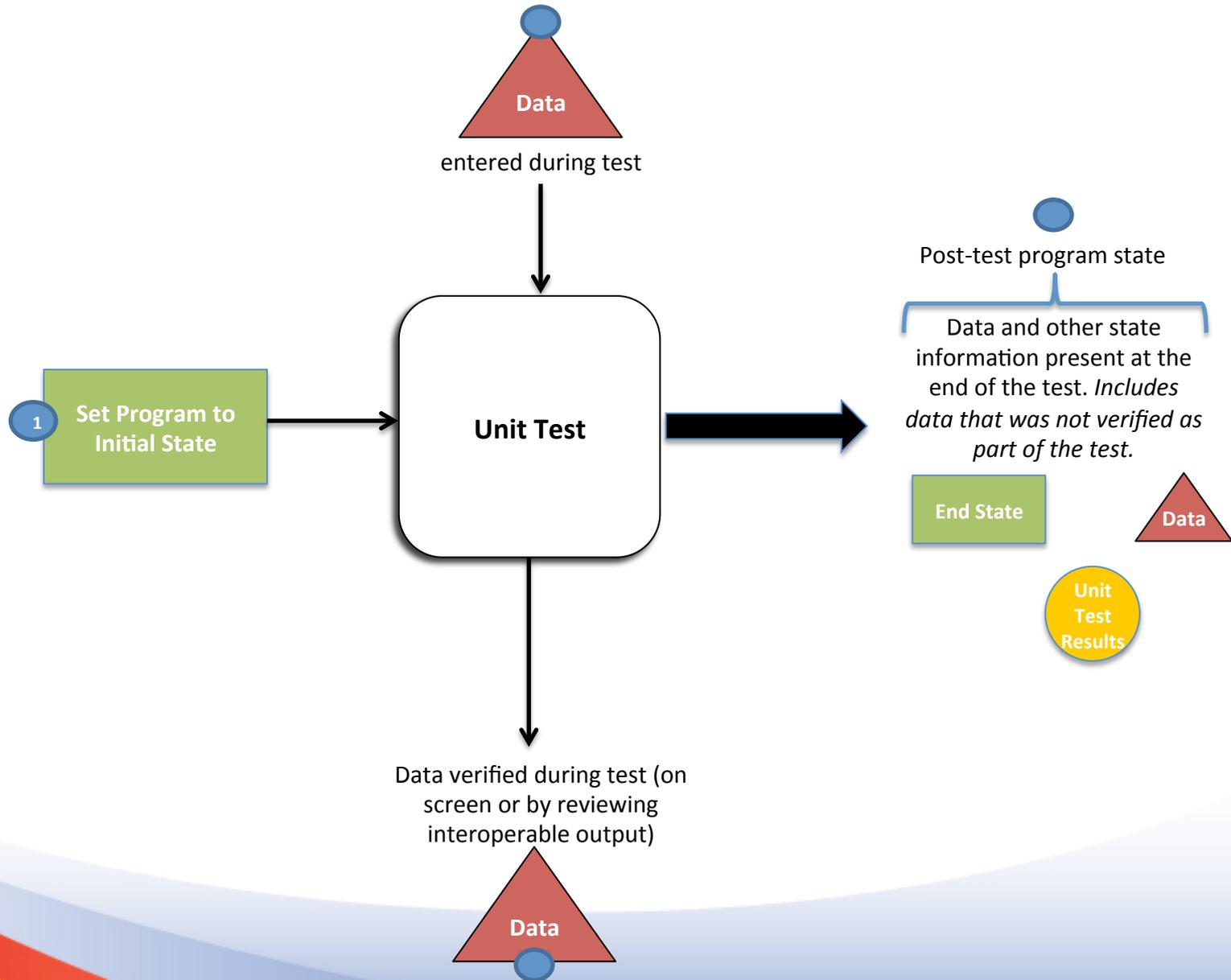
- Minimum requirement
- Independent tests
- Individual test data (input) and result(s) (output)
- Currently employed for 2011 and 2014 Edition test procedures
- Required for 2011 and 2014 Edition testing and certification

## Unit Based Testing





# Inputs and Outputs: One Unit Test

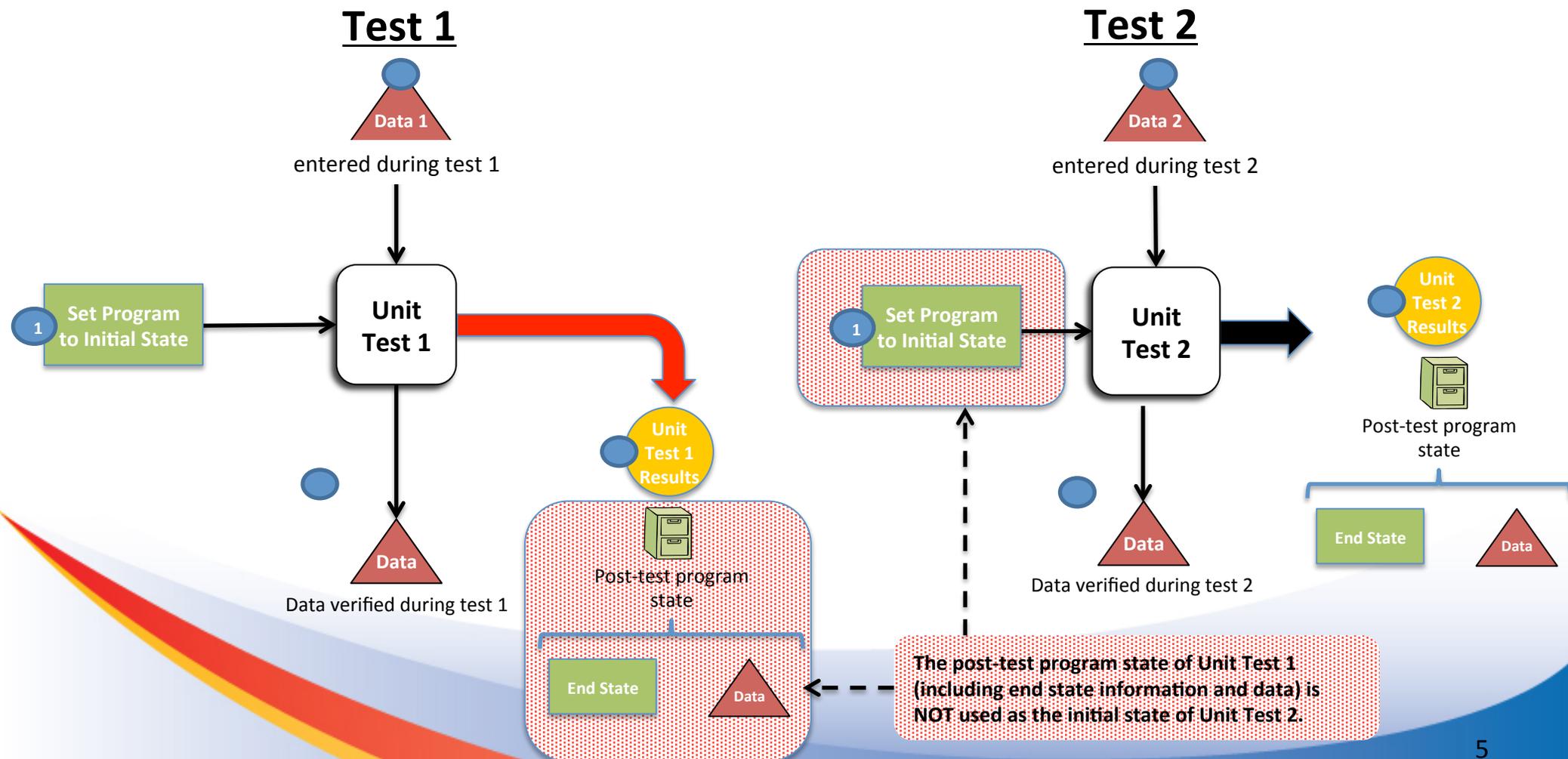


# Inputs & Outputs: Two Unit Tests performed sequentially



Current testing practices call for unit tests to be independent.

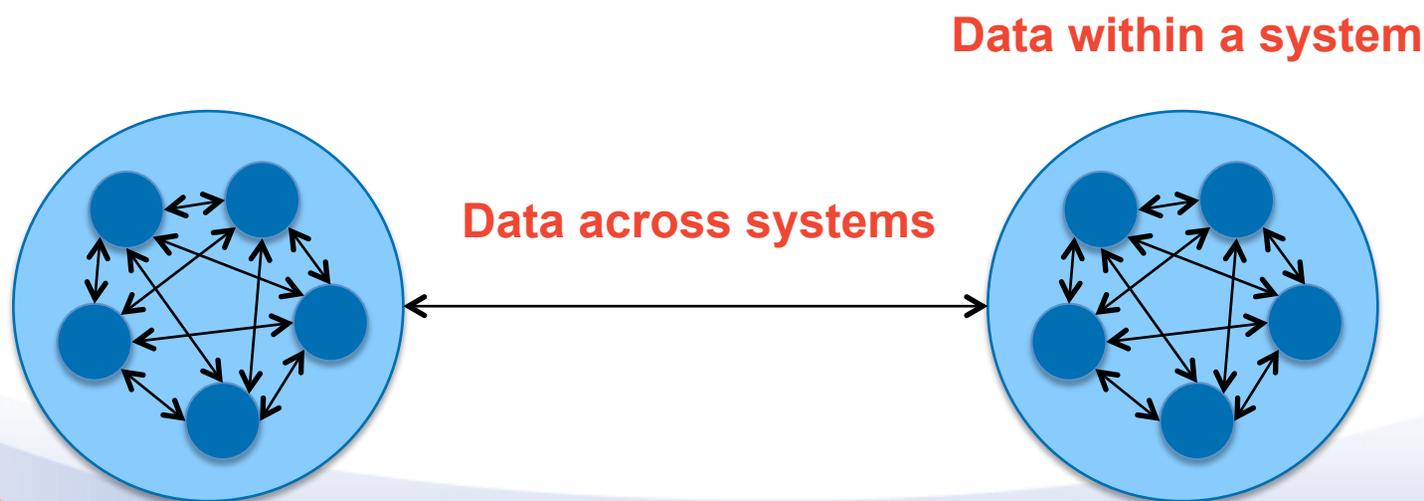
Testing frameworks often randomize the sequence of unit tests to detect any accidental carry-forward of data or program state information from one test to the next.





# Purpose of Scenario-Based Testing

- Make **clinically plausible** (i.e. align with plausible clinical scenarios)
- Ensure ability to use **data across systems**
- Ensure ability to use **data within a system**
- **Increases value** of testing
- **Improve efficiency** of testing
- **Reduce setup** of testing
- Make testing **consistent** and **replicable**





# Scenario-Based Testing

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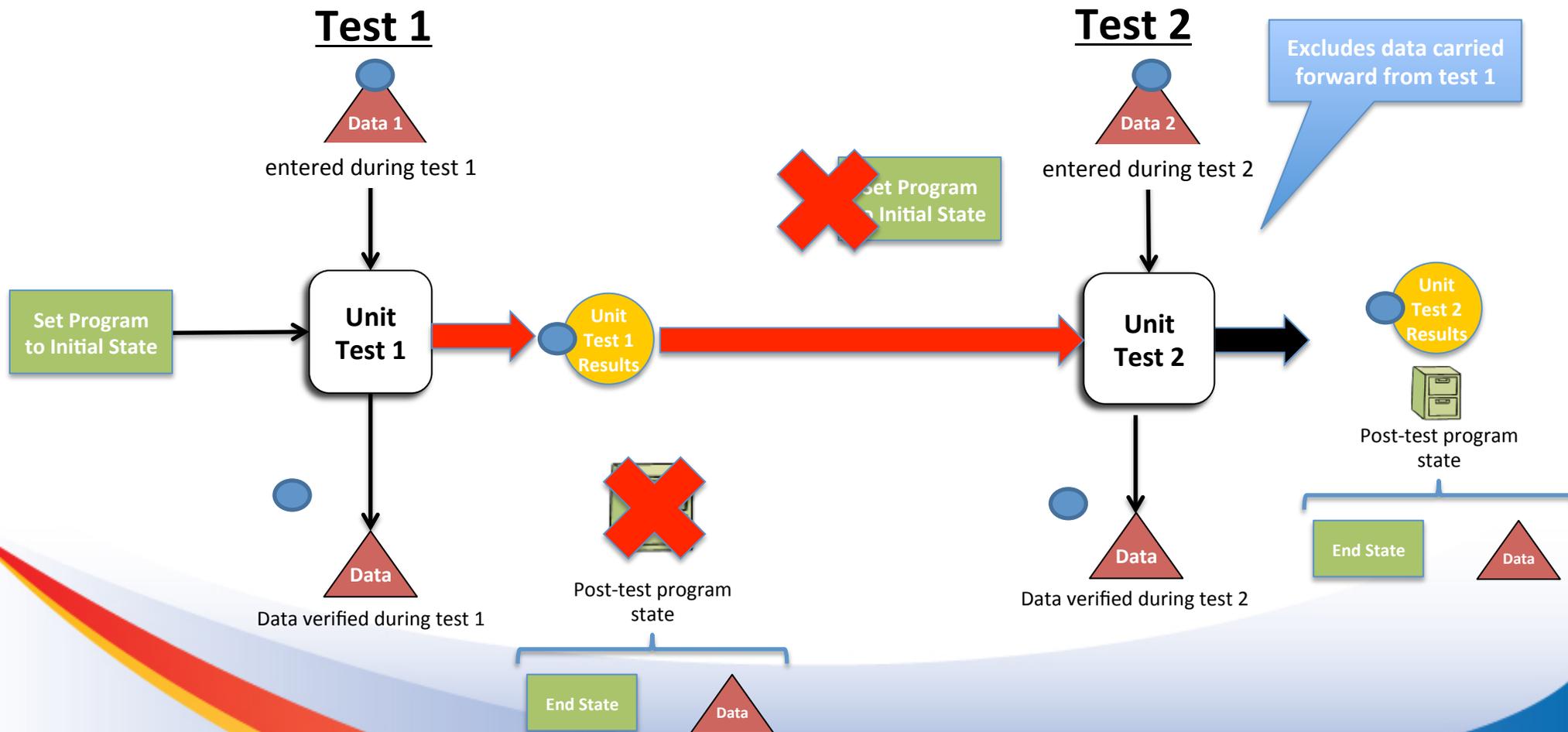
Alternative to unit-based testing

- Dependent tests
  - Dependent test data (input) and result(s) (output)
- Optional for 2014 Edition testing and certification



# Scenario Based Test Sequence

In order to avoid redundant data entry this test sequence assumes a sequence of unit tests. This is acceptable because the purpose of certification is different than that of quality testing. For certification we verify that the expected outcome can occur. We are not certifying that the code is bug free.

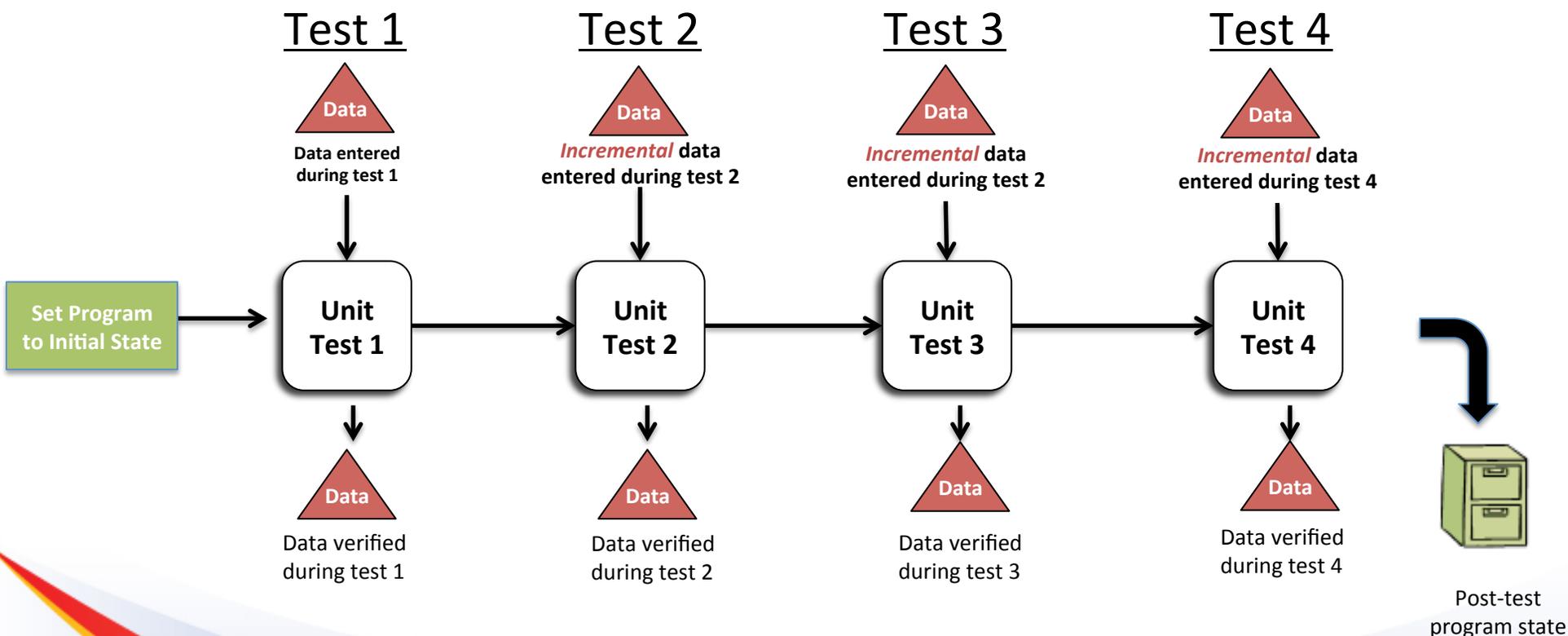




# Multi-Test Scenario

For each test after 1, a testing analyst must determine what data flows through from previous tests and what incremental data must be entered during the test.

- The volume of flow-through data is compounded with each test in the scenario.
- The flow-through data includes not only information that would otherwise be re-entered during subsequent tests. It also includes other data that might influence the quality of the unit test.



There can be two testing scripts each for tests 2, 3 and 4

- One instructs the tester to enter all of the data
- One instructs the tester only to enter the incremental data.

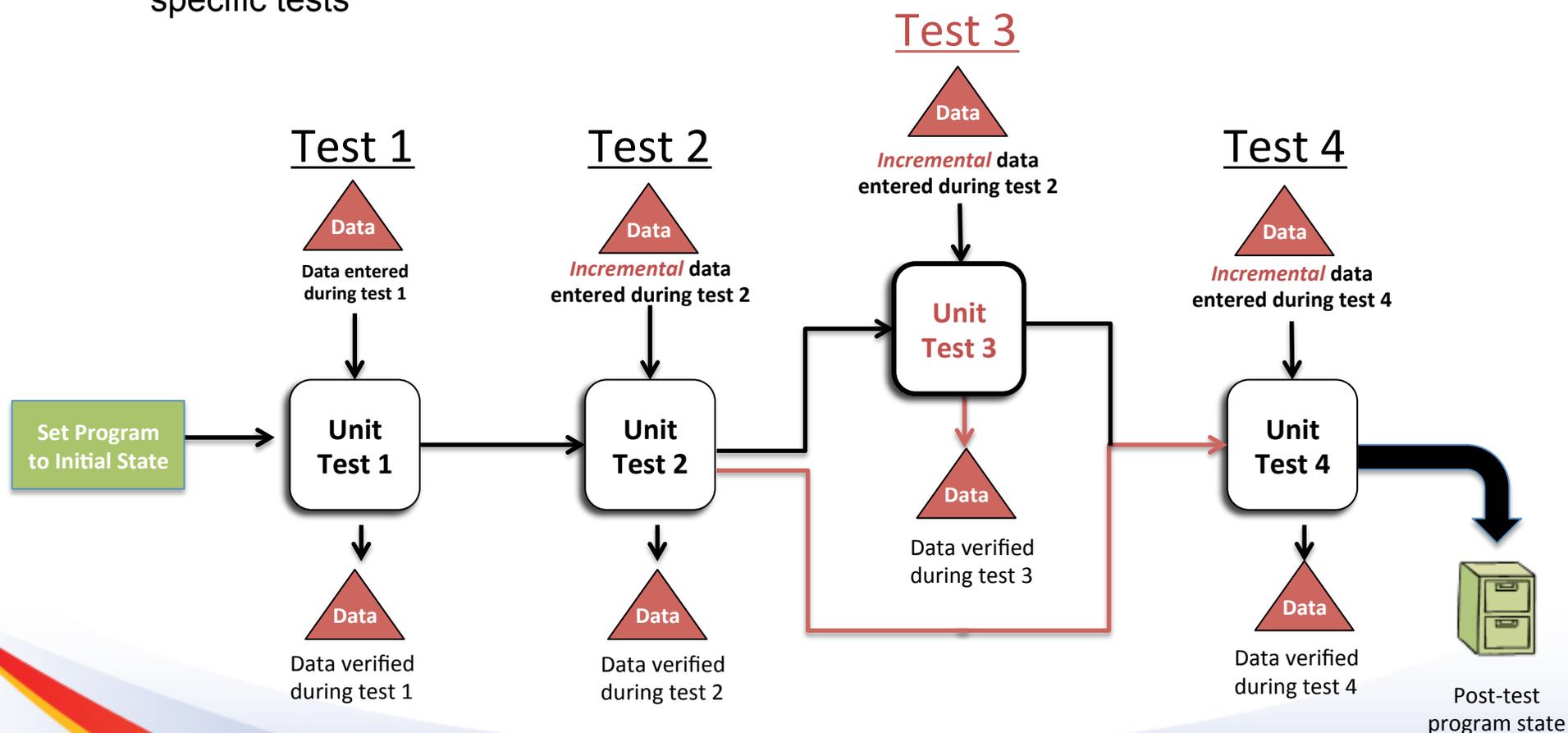


# Scenario-Based Sequence: Optional Tests

Scenarios represent a suggested sequence for testing criteria

In a scenario, unit tests can be added, removed, or rearranged for various reasons, depending on the scenario

- For instance, a scenario can be made setting specific by adding or removing setting specific tests



The flow through data includes not only information that would otherwise be re-entered during subsequent tests, but also other data that might influence the quality of the unit test.

# 2014 Edition Test Scenarios - Quick Facts

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## Components

- 2014 Edition Test Method
- Consistent and threaded data

## Scope

- Focused
- Clinically plausible workflow

## Specificity

- Not setting or test data specific
- Setting determined by unit test (i.e. add/remove tests depending on setting)
- Scenario details determined by patient test data (e.g. pediatric vs. geriatric)

## Documentation

- Test scenario diagram
- Test scenario procedure (contains the test scenario narrative)
- Test scenario data

# Test Scenario Introduction: EHR Interoperability: Intake

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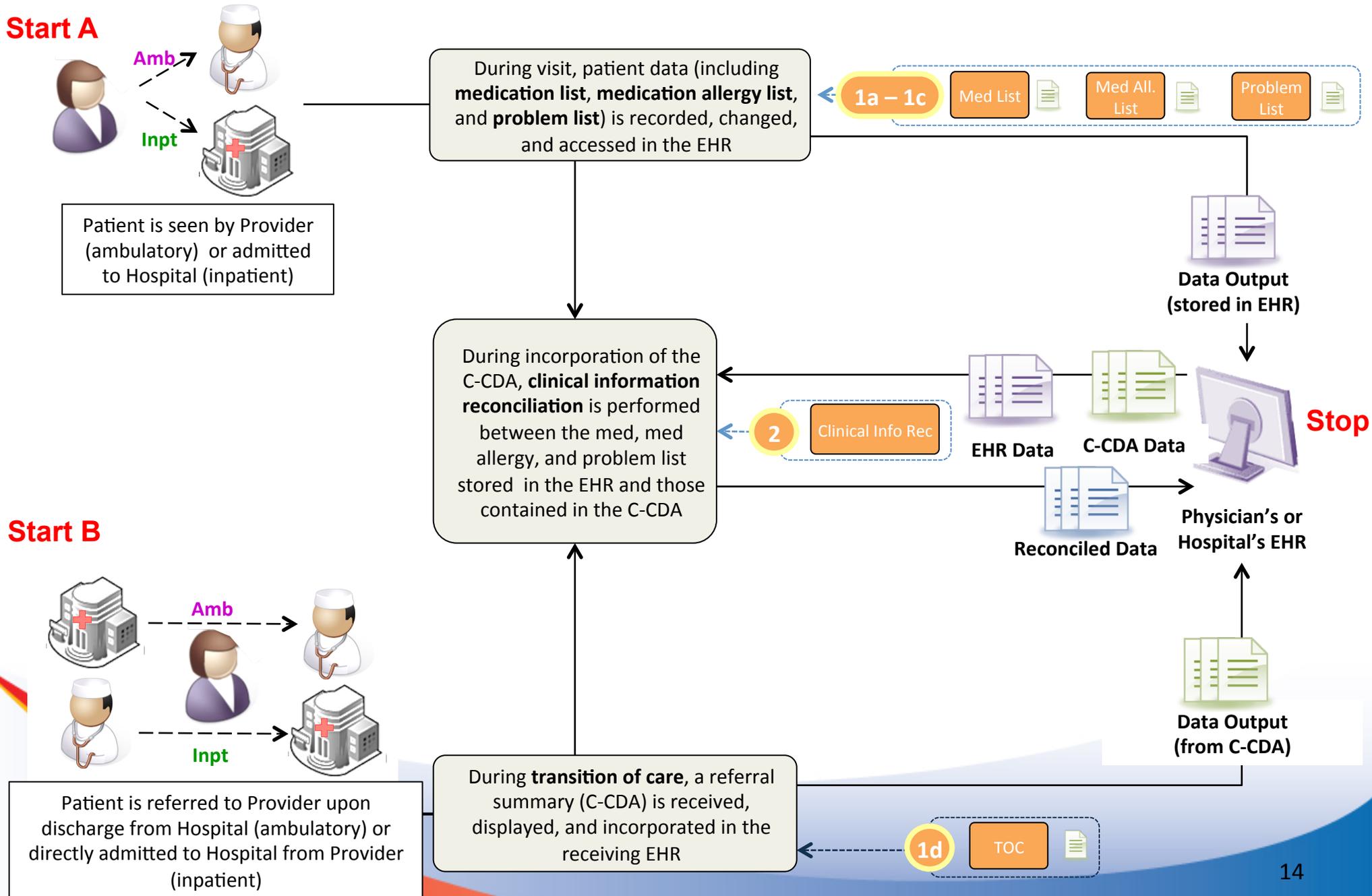
ONC has made the first draft Test Scenario Procedure available on its website:

- The [Draft Test Scenario](#) materials include
  - [Draft Test Scenario Procedure: EHR Interoperability: Intake](#)
    - Includes the following criteria:
      - (a)(4) Problem list
      - (a)(5) Medication list
      - (a)(6) Medication allergy list
      - (b)(4) Clinical information reconciliation
      - (b)(1) Transitions of care: receive, display, and incorporate
  - Draft Test Scenario Data: EHR Interoperability: Intake

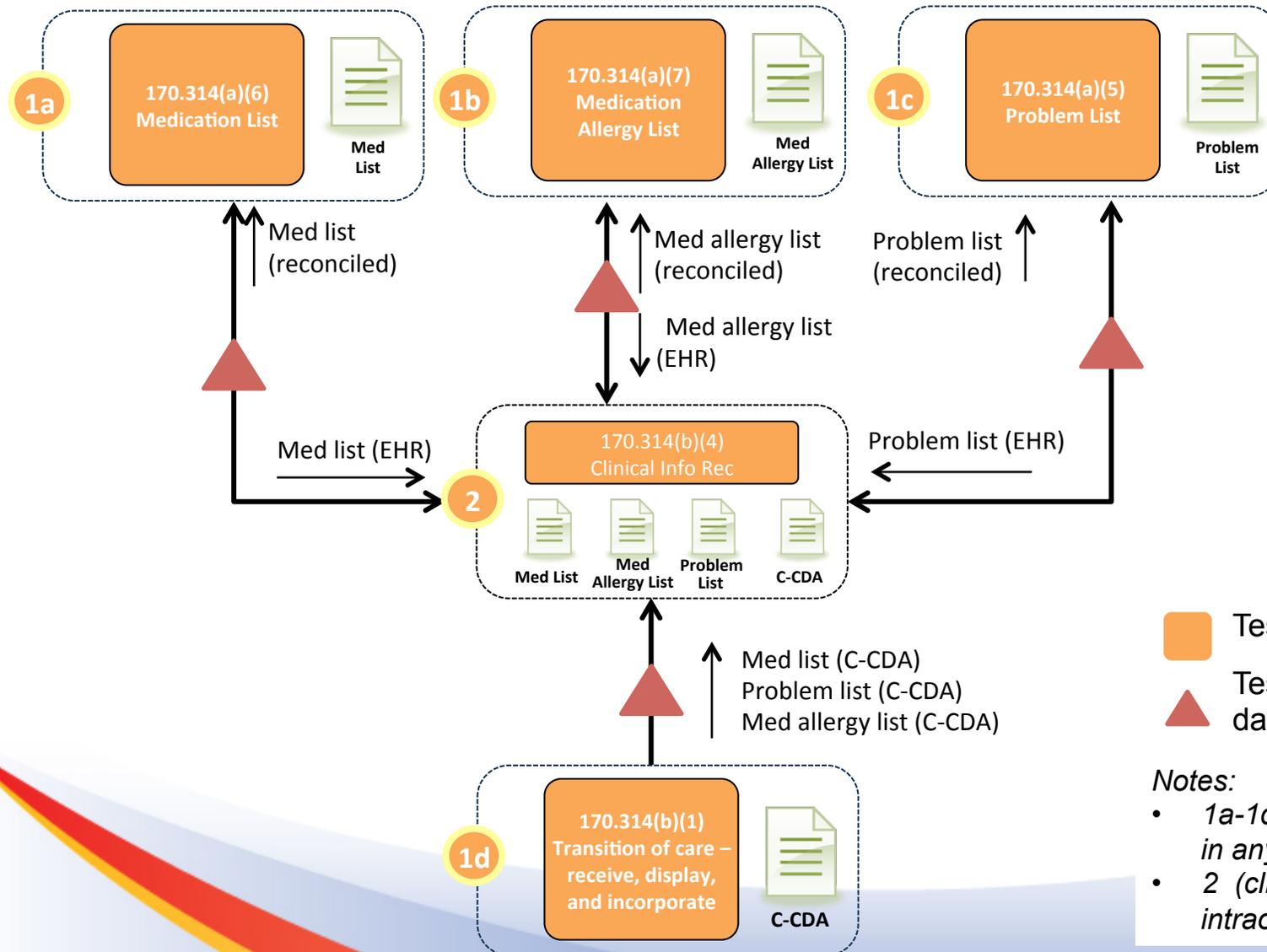
[Overview materials](#) for the draft Test Scenario Procedure are also available.

**The next three slides explore the structure and narrative of the EHR Interoperability: Intake Draft Test Scenario Procedure in more detail.**

# Clinically Plausible Workflow – EHR Interoperability: Intake



# Test Scenario Diagram – EHR Interoperability: Intake



- Tests unit test procedure
- Tests ability to automatically use data already stored in the EHR

**Notes:**

- 1a-1d are unit tests and can be tested in any order
- 2 (clinical info rec) tests intraoperability

# Test Scenario Narrative – EHR Interoperability: Intake



1a – 1c

## (a)(6) Medication list, (a)(7) Medication allergy list, (a)(5) Problem list

**Ambulatory:** Patient is seen by Provider. During this ambulatory visit, a medication, medication allergy, and problem list are recorded, changed, and accessed in the Provider's EHR.

**Inpatient:** Patient is admitted to Hospital. During this hospitalization, a medication, medication allergy, and problem list are recorded, changed, and accessed in the Hospital's EHR.

med, med allergy, and problem list stored in the EHR are pulled to do clinical information reconciliation

2

## (b)(4) Clinical information reconciliation

**Ambulatory/Inpatient:** During incorporation of the referral summary (C-CDA), clinical information reconciliation is performed between the medication, medication allergy, and problem list stored in the EHR and those contained in the C-CDA. Upon completion of the clinical information reconciliation, the reconciled medication, medication allergy, and problem list are stored in the EHR.

reconciled med, med allergy, and problem list are stored in the EHR



Physician's or Hospital's EHR

1d

## (b)(1) Transitions of care – receive, display, and incorporate

**Ambulatory:** Patient is referred to Provider upon discharge from Hospital. During transition of care, a referral summary (C-CDA) is received, displayed, and incorporated in the Provider's EHR.

**Inpatient:** Patient is directly admitted to Hospital from an ambulatory visit with Provider. During transition of care, a referral summary (C-CDA) is received, displayed, and incorporated in the Hospital's EHR.

med, med allergy, and problem list stored in the C-CDA are pulled to do clinical information reconciliation

# Summary

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## Purpose of Scenarios

- Make clinically plausibility
- Ensure use of data store in the EHR
- Increase value, efficiency, and consistency of testing

## Unit-Based Testing

- Currently implemented (required)
- Individual unit tests and data
- 2011 and 2014 Edition test procedures

## Scenario-Based Testing

- Future implementation (optional)
- Linked unit tests and threaded data
- First test scenario – EHR Interoperability: Intake
- Requesting public input



# Glossary

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<b>Unit Test or Unit Test Procedure*</b>	A unit test or unit test procedure evaluates the conformance of EHR technology to a single certification criterion
<b>Unit-Based Testing</b>	Use of unit tests to evaluate the conformance of EHR technology to a certification criterion or criteria
<b>Scenario-Based Testing</b>	Use of test scenarios to evaluate the conformance of EHR technology to a certification criterion or criteria
<b>Test Scenario</b>	Broad term used to describe the “linking” of unit tests to represent a clinically relevant workflow
<b>Test Scenario Diagram</b>	Visual representation of a test scenario to illustrate the “linked” unit tests
<b>Test Scenario Procedure (TSP)</b>	“Linked” unit test procedures/scripts to provide testing instructions specific to a test scenario
<b>Test Scenario Data (TSD)</b>	Data used within the TSP during testing (consistent with all testing, the data is independent of the TSP to allow for multiple test cases)
<b>Test Scenario Narrative</b>	Description of possible sequence of events associated with the clinically plausible workflow represented by the test scenario procedure (this is within the TSP)

\*Typically, a “test procedure,” without a “unit” or “scenario” modifier, refers to a unit test procedure