NHIN Trial Implementations
Use Case Requirements Document

Use Case Title: EHR – Lab Use Case

Workgroup: Provider Perspective

Version: Version 1, April 30, 2008

Description:

This document details the priority information exchanges identified by the Office of the National Coordinator (ONC) for Health Information Technology (HIT) for the Harmonized Use Case for Electronic Health Records (Lab Result Reporting) dated March 19, 2006 and the workflows, key assumptions, triggers and requirements for the exchanges to be successfully demonstrated. Six participants are scheduled to demonstrate this use case, and the document provides a general approach for all participants even though the actual workflows and their implementation will be participant specific.

The priority information flows as outlined by ONC for the EHR-Lab Use Case, focus on the electronic sharing of new laboratory test results with ordering and other providers and the retrieval of historic lab results within and across partner HIEs. Functional pre-conditions must be in place before the start of the use case.
This includes, but is not limited to, patients and clinicians being registered with their local HIE, lab results being available, an established relationship between consumer and clinicians requesting lab results from the HIE, data sharing agreements intra and inter community and the ability for authentication schemes to be negotiated.

A common understanding of the workgroup is that in order to implement the information interchange conforming to the functional specifications put forth in this document, the implementer must ensure that the implementing systems operate within a secure infrastructure that insures the privacy, integrity and availability of all personally identifiable health information as prescribed by HIPAA, all other applicable laws and regulations, and terms of any contracts and agreements. The workgroup also assumes that certain information technology infrastructure and functions are in place. Scenario 1 Information Exchanges #3 and #4 were approved by ONC to be combined as all aspects of their functional requirements are identical.

Additionally, the workgroup's understanding is that for scenario one, the HITSP/C36 Laboratory Result Message Component or the HITSP/C37 Laboratory Report Document Using IHE XD* Lab Component may be used for sending lab results. However, for scenario two, which must be demonstrated across NHIEs, the HITSP/C37 is required.

Priority Information Exchanges:

Page 16, Scenario 1 – Ordering clinician receives results integrated into the EHR; providers of care receive test results or notification of test results

Priority Info. Exchanges	Use Case Description
Information Exchange #1	Lab sends test results to data repository
Information Exchange #3	Data repository sends test results to ordering clinician's EHR (local or remote) or other clinical data system
Information Exchange #4	Data repository sends test results to the providers of care who can accept results in an EHR system (local or remote)

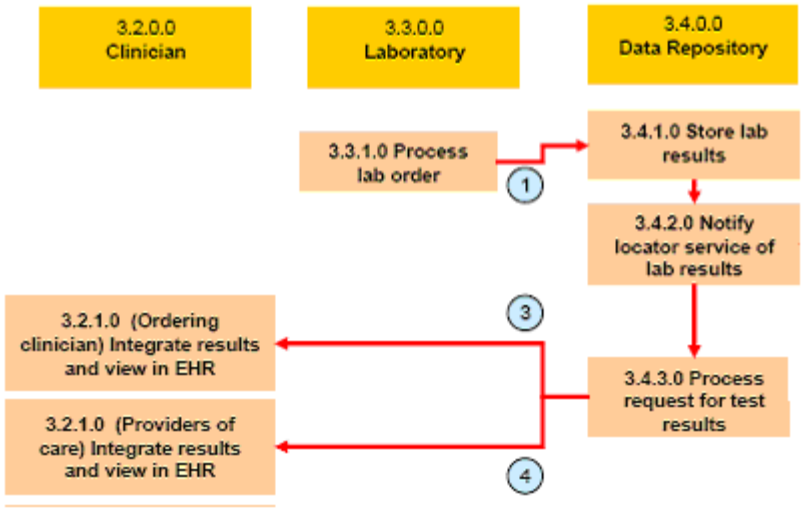
Page 17, Scenario 2 – Clinician queries for historical test results and receives results either integrated into the EHR or viewed using a clinical data system (non-EHR system)

Priority Info. Exchanges	Use Case Description
Information Exchange #1	Clinician queries locator service for patient and relevant test results
Information Exchange #2	Locator service sends to the clinician the location(s) of the test results in the data repository.
Information Exchange #3	The clinician sends a request for test results to the data repository.
Information Exchange #4	The data repository sends the test results to the clinician's EHR (local or remote) or other clinical data system.

ONC would like this scenario to include retrieving multiple historical lab results across NHIEs.

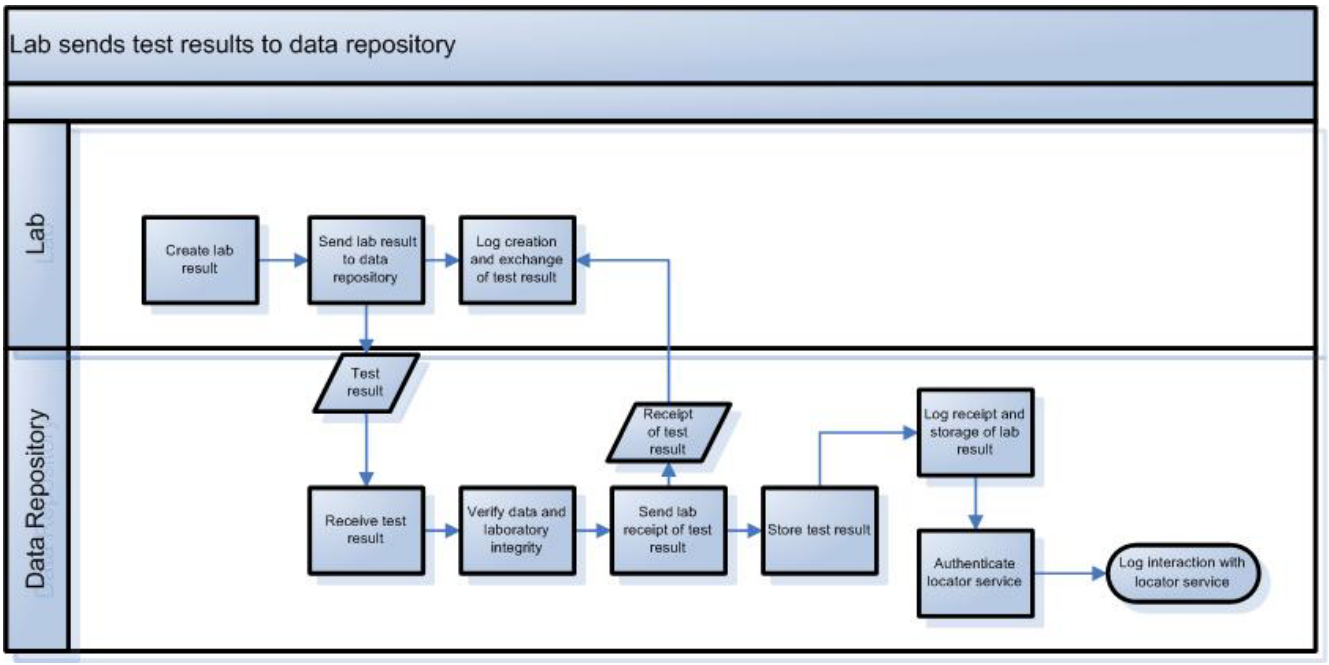
Use Case Scenario: [Scenario 1 – Ordering clinician receives results integrated into the EHR; providers of care receive test results or notification of test results]

Information Exchange #1: [Lab sends test results to data repository: 3.3.1.0, 3.4.1.0 and 3.4.2.0]



1 Information Exchange Workflow

1.1 Workflow Steps and Description



1.2 Use Case References (e.g. Events/Actions)

3.3 Laboratory Organization Perspective

Code	Description	Comment
3.3.1.0	**Event: Process Laboratory Order**	Laboratory creates the test results and sends the results to the data repository for availability to the ordering clinician and other providers of care, if appropriate.
3.3.1.1	**Action:** Create test results	Internal to the lab
3.3.1.2	**Action:** Send results to data repository	The laboratory transmits the results to the data repository with appropriate metadata necessary for indexing and browse/query response The data repository may be within the laboratory, may be a separate entity, or may be part of a community or regional service provider
3.3.1.3	**Action:** Log creation of test results	Internal to the lab

3.4 Data Repository Perspective

Code	Description	Comment
3.4.1.0	**Event: Store laboratory results**	
3.4.1.1	**Action:** Receive test results from laboratory	The laboratory test results as well as any pertinent information necessary for indexing and browse/query should be provided.

		Proper action should be taken when results updates are sent for error correction, completeness, etc.
3.4.1.2	**Action:** Verify authenticity of laboratory and lab test result file contents	Verify integrity of test result (file) contents and that the results came from the identified source. The test results should contain appropriate patient information and other information per agreed to standards and policies. Providers of care should be known.
3.4.1.3	**Action**: Acknowledge receipt of test lab results	Send acknowledgment to laboratory that integrity, authenticity and completeness of results are found.
3.4.1.4	**Action:** Store test lab results	Store lab results in data repository system and note any restrictions for use (e.g., providers of care list, patient consent restrictions, or sensitivity restrictions).
3.4.1.5	**Action:** Transmit lab test results to ordering clinician and other providers of care if appropriate	
3.4.1.6	**Action:** Log receipt and storage of lab test results	Internal to HIE
3.4.2.0	**Event: Notify locator service of laboratory results**	
3.4.2.1	**Action:** Authenticate to locator service	
3.4.2.2	**Action:** Send result location and related information to locator service	This should contain appropriate patient information and other information per agreed to standards and policies. Restrictions for use should also be provided by data repository (from laboratory) if not provided through supporting community or regional services.
3.4.2.3	**Action:** Log interaction with locator system	

1.3 Key Assumptions (These assumptions will apply to all information flows)

1. Established network and policy infrastructure to enable consistent, appropriate, and accurate information exchange across clinician systems, laboratories, data repositories and locator services. This includes, but is not limited to:
    a. methods to identify and authenticate users;
    b. methods to identify and determine providers of care;
    c. methods to enforce data access authorization policies;
    d. methods to ensure the veracity of data; and
    e. methods to correctly match patients across systems.

2. Clinicians have registered with the HIE and consumer access consents have been established.

3. Clinicians securely access lab test results either through an EHR system (local or remote) or a clinical data system.

4. Security and privacy policies, procedures and practices are commonly implemented to support acceptable levels of patient privacy and security.

5. Appropriate standards protocols; patient identification methodology; consent; privacy and security procedures; coding, vocabulary and normalization standards have been agreed to by all relevant participants.

6. Legal and governance policies regarding data access authorizations, data ownership, and data use are in effect.

7. Secure electronic transport and consent as defined by the HITSP security and privacy constructs is assumed between sender(s) and receiver(s)

2 Information Exchange Requirements

2.1 Triggers

The trigger for the transmission of a result is that it is deemed as releasable.

2.2 Data Content Requirements

This HITSP IS01 specification combines all of the Transaction Packages, stand-alone Transactions, and Components that comprise the solution set for the EHR Use Case. The core Transaction Packages are:

The Send Laboratory Result Message Transaction Package includes all the data definitions and interactions for the Health Level Seven (HL7) V2.5.1 Laboratory Result Message. It relies on two Components:

- The Laboratory Result Message Component (HITSP/C36) specifies constraints on the HL7 V2.5.1 message and the EHR Laboratory Result Terminology Component (HITSP/C35) describes the vocabulary constraints.

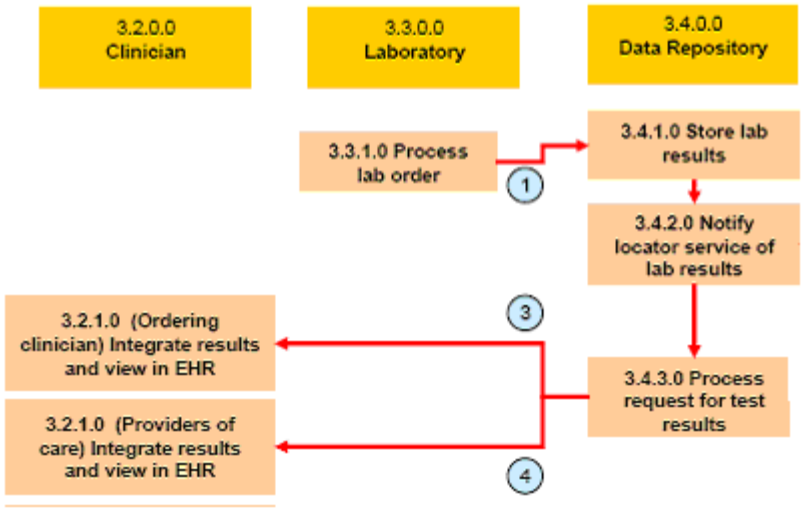
The Manage Sharing of Documents Transaction Package is a generic document-sharing paradigm that can be used for any electronic document. For this specification, the document of interest is the HL7 Clinical Document Architecture (CDA) specification based on the Integrating the Healthcare Enterprise (IHE) Laboratory Technical Framework XD*-LAB.

- The HITSP/C37 Laboratory Report Document Using IHE XD* Lab Component describes the Laboratory CDA document and the HITSP/C35 EHR Laboratory Result Terminology Component describes the vocabulary constraints.

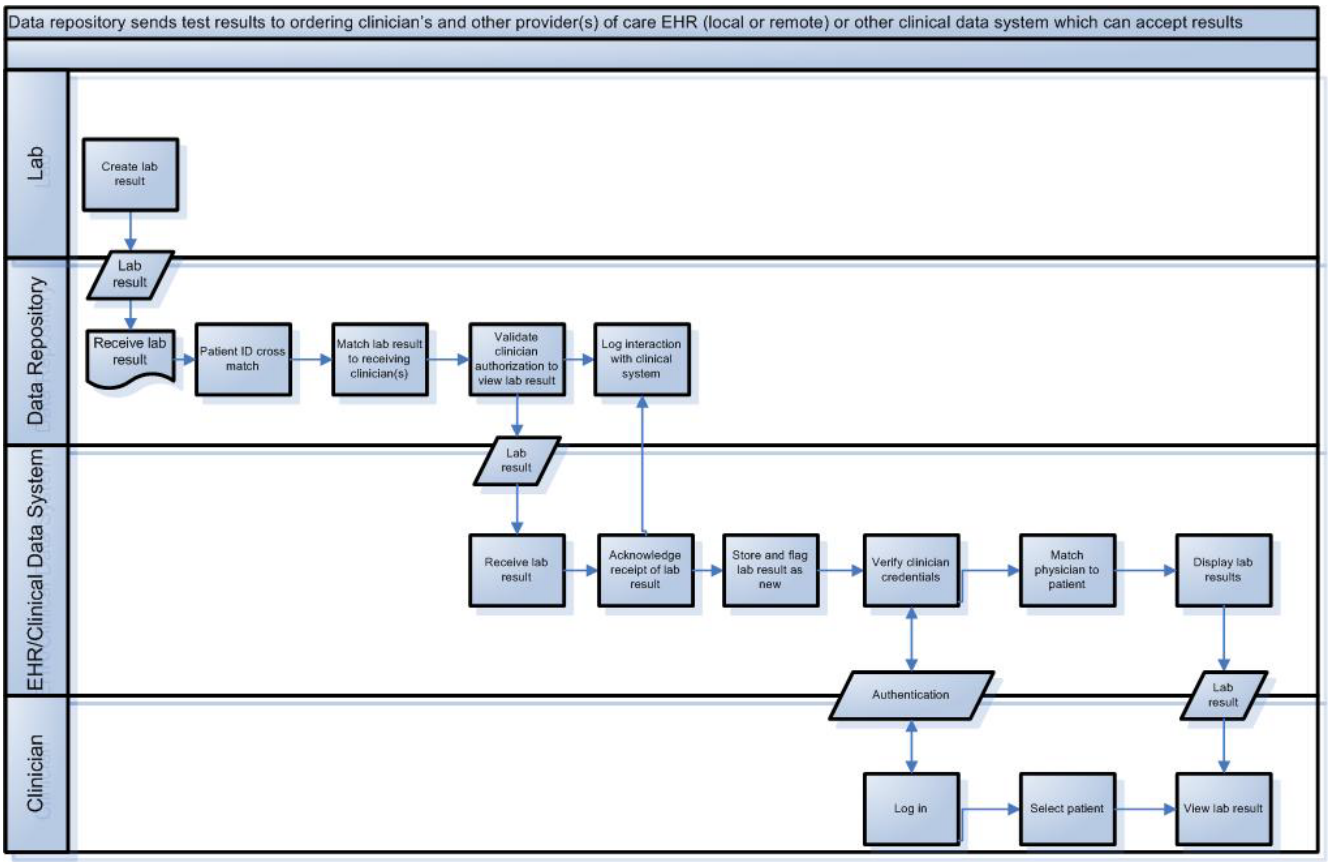
2.3 Other unique requirements

Labs must have identifying information of the ordering clinician's repository.

Information Exchange #3 and #4: [Data repository sends test results to ordering clinician's and other provider's of care EHR (local or remote) or other clinical data system which can accept results: 3.4.3.0 and 3.2.1.0]



1 Information Exchange Workflow



1.1 Use Case References (e.g. Events/Actions)

3.4 Data Repository Perspective

3.4.3.0	**Event: Process Request for Laboratory Test Results**	The data repository receives a request for test result content and verifies the authenticity of the clinician, the integrity of the request, and any restrictions for use. The data repository either sends the test results for integration into the clinician's EHR, or sends the content to another clinical data system for viewing. The secrecy of the content is maintained during transmission.
3.4.3.1	**Action:** Receive and validate the query request	Parse, validate, and acknowledge received data query requests.
3.4.3.2	**Action:** Authenticate and verify as ordering clinician or provider of care	May include provider identification and validation of credentials, privileges and/or other authorization. Authentication and verification may be provided through community or regional services. This may include a trust relationship whereby the clinician is authenticated and authorized once by the community or regional service. The

		authentication and verification is then carried through the query/retrieval processes.
3.4.3.3	**Action:** Authorize release of laboratory test results	Test results released to clinician based on verification as ordering clinician or provider of care status and other appropriate restrictions for use.
3.4.3.4	**Action:** Transmit lab results of an identified patient to an ordering clinician or provider of care	The means of transport will vary depending on whether an EHR system is available to receive the results, or if a web application is used.
3.4.3.5	**Action:** Log interaction	

3.2 Clinician Perspective

Code	Description	Comment
3.2.1.0	**Event: Integrate results and view in EHR**	
3.2.1.1	**Action:** Receive lab test result as ordering clinician or provider of care	New test results, upon completion, may be sent directly to the clinician's EHR system (local or remote) without an intermediate request action.
3.2.1.1a	**Alternate Action:** Send request for historical lab test result content to data repository(ies)	The clinician selects data repository(ies) from which to retrieve lab test results and sends a request(s). The request may be sent from the EHR system or via web application.
3.2.1.1b	**Alternate Action:** Submit authentication information to the data repository	
3.2.1.2	**Action:** Confirm data integrity of received results	Upon receiving the test result set (messages), the EHR system confirms that the message was received in a complete and unchanged format.
3.2.1.3	**Action:** Parse and validate results content	The EHR system opens and parses each electronic result. Individual records are checked for appropriate information, completeness, proper codes, and patient identifying information.
3.2.1.4	**Action:** Merge data into EHR	The EHR aggregates patient data from each data repository. Each received record is processed and correlated to a patient in the EHR system. Where new results cannot be unequivocally matched with a patient, an exception list should be produced to allow human resolution
3.2.1.5	**Action:** New results are flagged within EHR	The EHR system should provide a clear indicator as to the status the review process of all results by clinicians
3.2.1.6	**Action:** Acknowledge receipt of lab results	A message is sent to the lab data repository indicating which results were successfully processed and indicates any results that were undeliverable and unprocessed.

3.2.1.7	**Action:** Log receipt of lab test results	Include patient consent information in log.
3.2.1.7a	**Alternate Action:** Produce exception list of errors	Where inbound lab results records cannot be unequivocally matched with the EHR, an exception list is produced to allow human resolution

1.2 Key Assumptions (In addition to general assumptions stated in Scenario 1 - Information flow #1)

1. The laboratory has sent the laboratory result document to the repository and the repository has notified the locator service of the document location.
2. Meta data for the lab result has been recorded in the registry

2 Information Exchange Requirements

2.1 Triggers

1. There is a clinical need for the patient laboratory result(s)
2. Processing request for results by the repository is initiated by query from clinician's clinical data system or web application.
3. Lab – HIE transmissions are triggered by results messages originating from Lab source system(s).
4. HIE – clinical data system interactions are triggered by pull (from clinical data system) or push (to clinical data system)
5. Clinician notification will vary by EHR system. Common notification schemes include e-mail 'ticklers', EHR inbox messaging, etc.

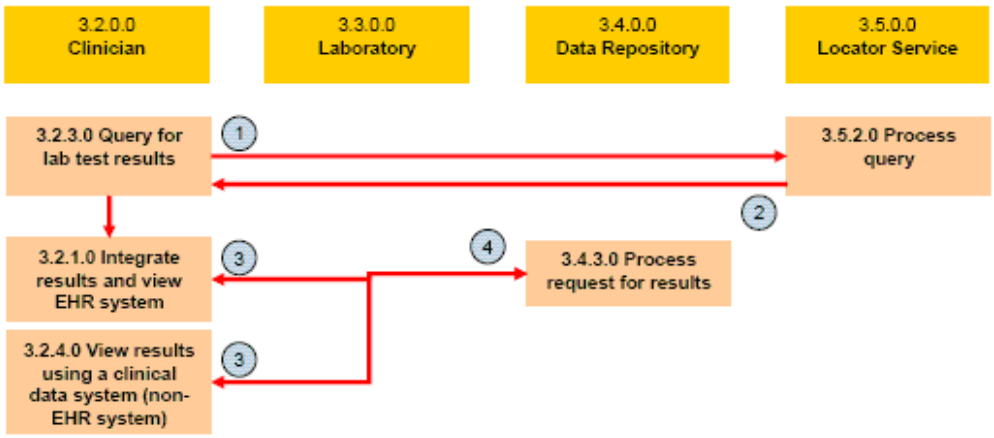
2.2 Data Content Requirements

Refer to Scenario #1 – Information Flow #1

2.3 Other unique requirements

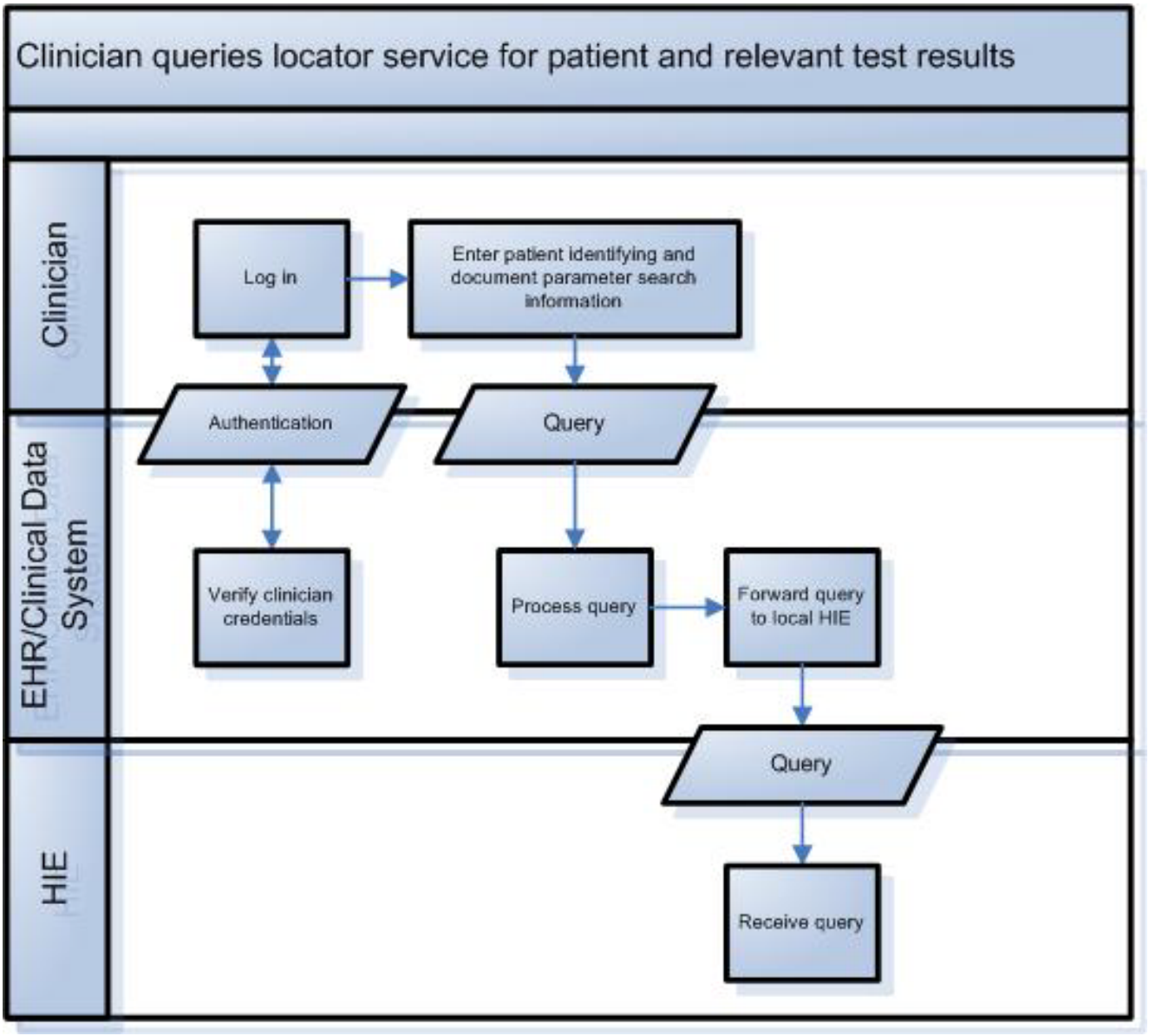
Use Case Scenario: [Scenario 2 – Clinician queries for historical test results and receives results either integrated into the EHR or viewed using a clinical data system (non-EHR system)]

Information Exchange #1: [Clinician queries locator service for patient and relevant test results: 3.2.3.0]



1 Information Exchange Workflow

1.1 Workflow Steps and Description



1.2 Use Case References (e.g. Events/Actions)

3.2 Clinician Perspective

3.2.3.0	**Event: Query for laboratory (historical) test results**	The clinician queries the locator service for the availability and location of lab test results for a specified patient and receives the location of the results. Queries to the locator service could be accomplished either through the EHR user interface directly or through another clinical data system.
3.2.3.1	**Action:** Submit authentication	Establish clinician's identity and verify whether clinician is a provider of care

3.2.3.0	**Event: Query for laboratory (historical) test results**	The clinician queries the locator service for the availability and location of lab test results for a specified patient and receives the location of the results. Queries to the locator service could be accomplished either through the EHR user interface directly or through another clinical data system.
	information to locator system	Note that the clinician may be an individual, an organization or "system". The nature of the identification/authentication will be different in each case. One of many authentication methods could be used (biometrics, card, token or user ID and password, cryptographic techniques).
3.2.3.2	**Action:** Clinician and locator system agree on patient identity through patient trait matching	The clinician and locator system must verify that they are interacting about the same patient. Patient identity may be agreed upon by a number of means including demographic information, agreed-to mapping of patient IDs, or shared patient ID. The means is dependent on whether the locator service is provided by a third-party, or part of available community or regional services. A set of traits (such as name, DOB, gender, etc.) may be used by a locator service to perform a probabilistic match. Business rules could be established across a community or region to determine minimum acceptable combinations of traits (for example, name-only searches not allowed without a DOB). Alternate Actions 3.2.3.2a-b provides the functionality for a priori agreed to identifiers by the clinician and locator service and lab data repository.
3.2.3.2a	**Alternate Action:** Clinician and locator system agree on patient identity based on shared MPI	If the entity to which the clinician is affiliated (hospital, HMO, private physician practice, etc.) has already registered the patient internally and uploaded the entry into a shared MPI, the provider can capture and submit the entity's internal identifier for that patient (e.g., the patient's medical record number for that hospital) to a locator service. In this case, the provider would not need to manually enter demographic traits (name, date of birth [DOB], etc.) since that data are already present in the MPI.
3.2.3.2b	**Alternate Action:** Clinician and locator system agree on patient identity based on patient identifier matching	The locator system matches the patient identifiers supplied by the clinician with patient identifiers known within the locator service.
3.2.3.3	**Action:** Transmit request for specific lab test results based on order	The clinician may request specific test results based on a unique identification number, eliminating the need for browsing through all available test results. This can be

3.2.3.0	**Event: Query for laboratory (historical) test results**	The clinician queries the locator service for the availability and location of lab test results for a specified patient and receives the location of the results. Queries to the locator service could be accomplished either through the EHR user interface directly or through another clinical data system.
	number or other unique test result identification	performed through a web application or through a standards-based query request from the clinician's EHR.
3.2.3.3a	**Alternate Action:** Browse, select and confirm the relevant test results for the correct patient and transmit request	Based on the patient information provided by the clinician (either the entity identifier or demographic traits), a list of candidate patient matches will be retrieved from the locator service. This list should contain demographic data that will help the clinician determine which of the potential matches actually corresponds to the patient. From the list of candidates previously retrieved, the clinician will select and confirm the entry or entries that correspond to the patient and those applicable to reason for query (e.g. date range, test groups, etc.). The clinician may also determine that none of the candidates in the list are correct matches.
3.2.3.4	**Action:** Receive the data repository location where the test results are stored	The locator service provides pointer (i.e., links) to the location(s) where the test result(s) are stored. The clinician uses these locations to retrieve the test results.
3.2.3.5	**Action:** Log interaction with locator service	

2.4 Key Assumptions (In addition to general assumptions stated in Scenario 1 - Information flow #1):

Preconditions:

1. Patient consent has been obtained;
2. Clinician should have proper identification/authorization to access patient-specific information everywhere such information exists;
3. Clinician should be able to uniquely identify patient for which information has been requested;
4. Clinician request will return ALL information available for the specific patient; and
5. Record locator service should have lab data locations for the specific patient.

Post-conditions:

6. Locations of lab results should be known to record locator service;
7. Clinician should be able to retrieve more than 1 record at a time; and
8. Clinician should have proper identification/authorization to access and review patient-specific information.

9.

2 Information Exchange Requirements

2.1. Triggers

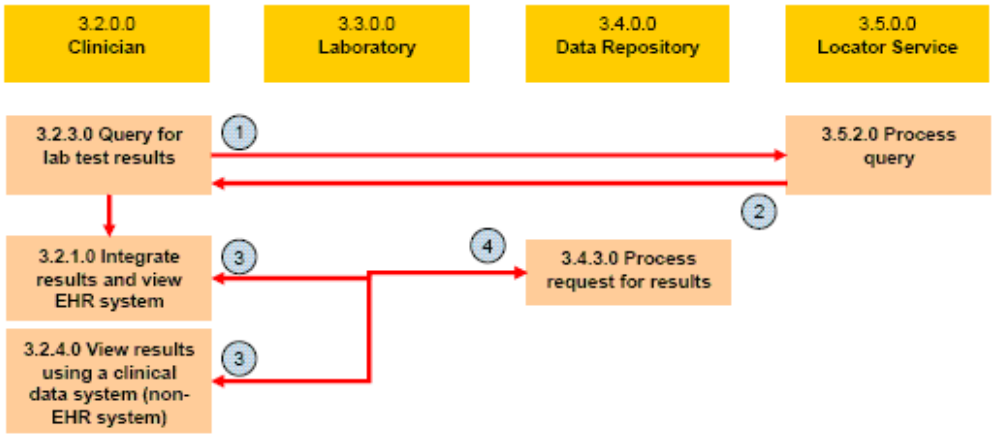
Patient encounter, either primary care (front desk or nurse might request labs) or emergency department, or where there is a clinical need for pertinent information.

Data Content Requirements

Refer to Scenario #1 – Information Flow #1

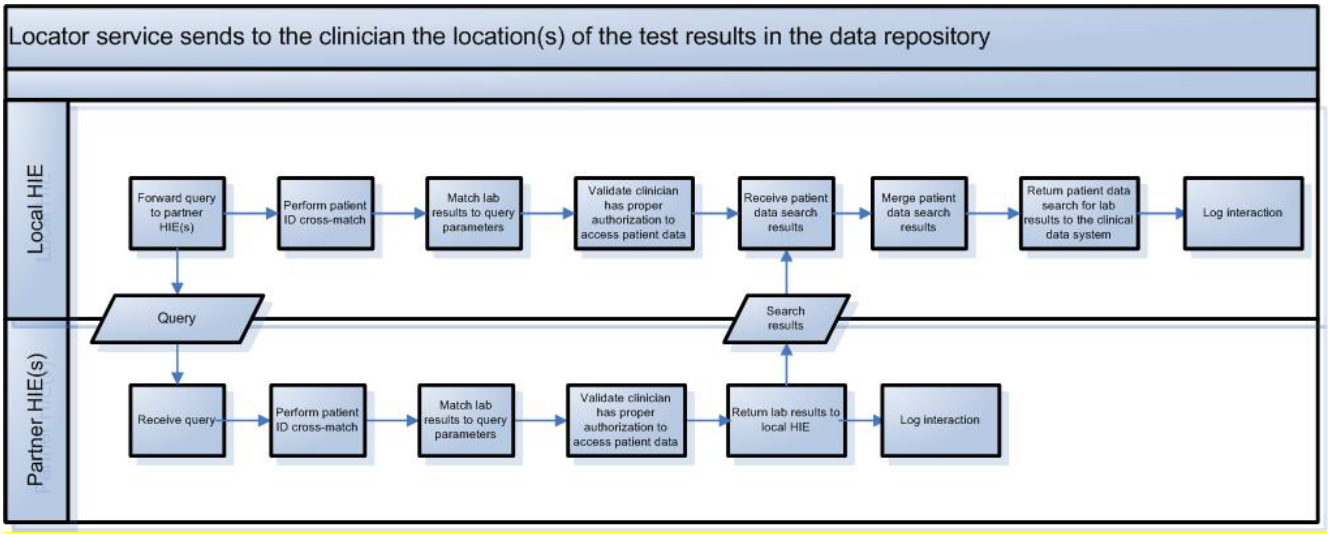
2.2 Other unique requirements

Information Exchange #2: [Locator service sends to the clinician the location(s) of the test results in the data repository: 3.5.2.0



1 Information Exchange Workflow

1.1 Workflow Steps and Description



1.2 Use Case Reference (e.g. Events/Actions)

3.5 Locator Service

3.5.2.0	**Event: Process query to provide laboratory test result location(s)**	
3.5.2.1	**Action:** Authenticate clinician requesting laboratory test results	Establish clinician's identity and verify status as ordering clinician or provider of care. Note that the clinician may be an individual, an organization or "system." The nature of the identification/authentication will be different in each case. One of many authentication methods could be used (biometrics, card, token or user ID and password, cryptographic techniques).
3.5.2.2	**Action:** Clinician and locator system agree on patient identity	The clinician and locator system must verify that they are interacting about the same patient. Patient identity may be agreed upon by a number means including demographic information, agreed-to mapping of patient IDs, or shared patient ID. The means is dependent on whether the locator service is provided by a third-party, or part of available community or regional services. A set of traits (such as name, DOB, gender, etc.) may be used by a locator service to perform a probabilistic match. Business rules could be established across a community or region to determine minimum acceptable combinations of traits (for example, name-only searches not allowed without a DOB).
3.5.2.3	**Action:** Receive request for lab test results based on lab order number or other unique lab test identifier	The clinician may request specific test results based on a unique identification number, eliminating the need for browsing through all available test results. This can be performed through a web application or through a standards-based query request from the clinician's EHR.
3.5.2.3a	**Alternate Action:** Provide lab result availability information based on clinician query/browse	
3.5.2.4	**Action:** Authorize data release	Test result information released to clinician based on verification as ordering clinician or provider of care status and other appropriate restrictions for use.
3.5.2.5	**Action:** Send lab result location (links) pointers to authorized clinician.	The location pointers will be used by the clinician to retrieve the lab test results for either viewing or integration into the EHR.
3.5.2.6	**Action:** Log interaction with clinician	

1.3 Key Assumptions (In addition to general assumptions stated in Scenario 1 – Information flow #1):

1. All pre-conditions and activities defined in Scenario #1 have been fulfilled
2. The laboratory has registered the laboratory result document in the repository and the repository has notified the locator service of the document location

2. Information Exchange Requirements

2.1 Triggers

Clinician submits a query for lab results

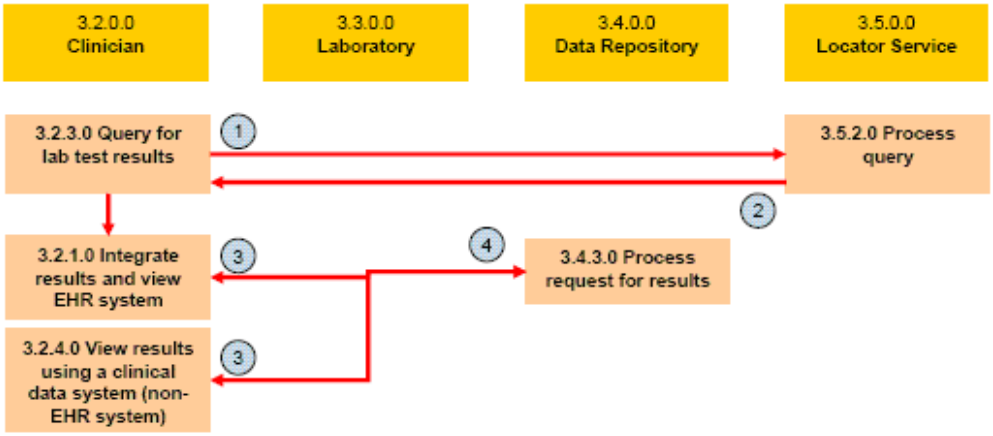
2.2 Data Content Requirements

Refer to Scenario #1 – Information Flow #1

2.3 Other unique requirements

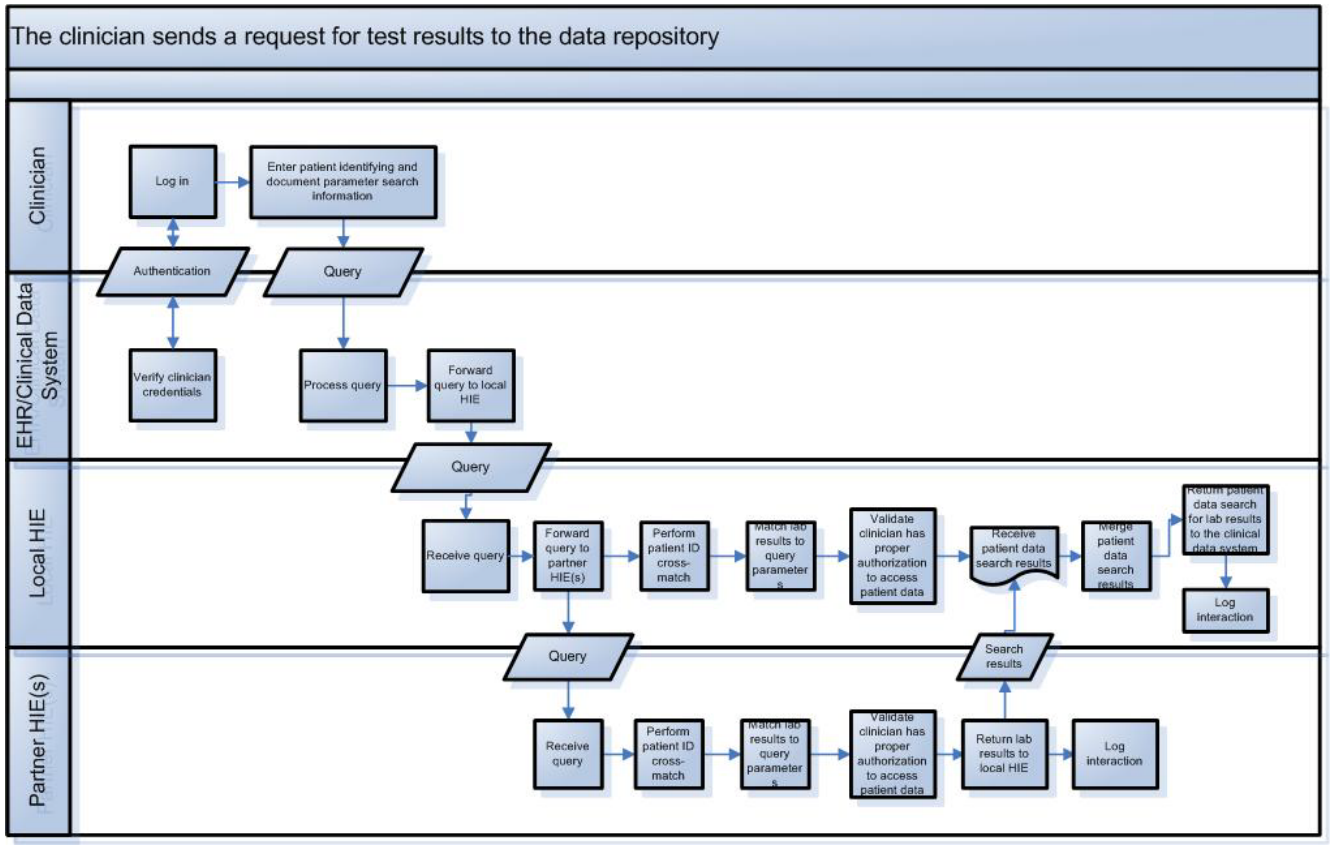
The local repository should return ALL patient data search results so the clinician is not required to send out multiple requests to individual locations for results.

Information Exchange #3: [The clinician sends a request for test results to the data repository (3.2.3.0 and 3.4.3.0)]



1 Information Exchange Workflow

1.1 Workflow Steps and Description



2..1. Use Case Reference (e.g. Events/Actions)

3.2.3.0	**Event: Query for laboratory (historical) test results**	The clinician queries the locator service for the availability and location of lab test results for a specified patient and receives the location of the results. Queries to the locator service could be accomplished either through the EHR user interface directly or through another clinical data system.
3.2.3.1	**Action:** Submit authentication information to locator system	Establish clinician's identity and verify whether clinician is a provider of care Note that the clinician may be an individual, an organization or "system". The nature of the identification/authentication will be different in each case. One of many authentication methods could be used (biometrics, card, token or user ID and password, cryptographic techniques).
3.2.3.2	**Action:** Clinician and locator system agree on patient identity through patient trait matching	The clinician and locator system must verify that they are interacting about the same patient. Patient identity may be agreed upon by a number of means including demographic information, agreed-to mapping of patient IDs, or shared patient ID. The means is dependent on whether the locator service is provided by a third-party, or part of available community or regional services. A set of traits (such as name, DOB, gender, etc.) may be used by a locator service to perform a probabilistic match. Business rules could be established across a community or region to determine minimum acceptable combinations of traits (for example, name-only searches not allowed without a DOB). Alternate Actions 3.2.3.2a-b provides the functionality for a priori agreed to identifiers by the clinician and locator service and lab data repository.
3.2.3.2a	**Alternate Action:** Clinician and locator system agree on patient identity based on shared MPI	If the entity to which the clinician is affiliated (hospital, HMO, private physician practice, etc.) has already registered the patient internally and uploaded the entry into a shared MPI, the provider can capture and submit the entity's internal identifier for that patient (e.g., the patient's medical record number for that hospital) to a locator service. In this case, the provider would not need to manually enter demographic traits (name, date of birth [DOB], etc.) since that data are already present

		in the MPI.
3.2.3.2b	**Alternate Action:** Clinician and locator system agree on patient identity based on patient identifier matching	The locator system matches the patient identifiers supplied by the clinician with patient identifiers known within the locator service.
3.2.3.3	**Action:** Transmit request for specific lab test results based on order number or other unique test result identification	The clinician may request specific test results based on a unique identification number, eliminating the need for browsing through all available test results. This can be performed through a web application or through a standards-based query request from the clinician's EHR.
3.2.3.3a	**Alternate Action:** Browse, select and confirm the relevant test results for the correct patient and transmit request	Based on the patient information provided by the clinician (either the entity identifier or demographic traits), a list of candidate patient matches will be retrieved from the locator service. This list should contain demographic data that will help the clinician determine which of the potential matches actually corresponds to the patient. From the list of candidates previously retrieved, the clinician will select and confirm the entry or entries that correspond to the patient and those applicable to reason for query (e.g. date range, test groups, etc.). The clinician may also determine that none of the candidates in the list are correct matches.
3.2.3.4	**Action:** Receive the data repository location where the test results are stored	The locator service provides pointer (i.e., links) to the location(s) where the test result(s) are stored. The clinician uses these locations to retrieve the test results.
3.2.3.5	**Action:** Log interaction with locator service	
3.4.3.0	**Event: Process Request for Laboratory Test Results**	The data repository receives a request for test result content and verifies the authenticity of the clinician, the integrity of the request, and any restrictions for use. The data repository either sends the test results for integration into the clinician's EHR, or sends the content to another clinical data system for viewing. The secrecy of the content is maintained during transmission.
3.4.3.1	**Action:** Receive and validate the query request	Parse, validate, and acknowledge received data query requests.
3.4.3.2	**Action:** Authenticate and verify as ordering clinician or provider of care	May include provider identification and validation of credentials, privileges and/or other authorization. Authentication and verification may be provided through community or regional services. This may include a trust relationship whereby the clinician is

		authenticated and authorized once by the community or regional service. The authentication and verification is then carried through the query/retrieval processes.
3.4.3.3	**Action:** Authorize release of laboratory test results	Test results released to clinician based on verification as ordering clinician or provider of care status and other appropriate restrictions for use.
3.4.3.4	**Action:** Transmit lab results of an identified patient to an ordering clinician or provider of care	The means of transport will vary depending on whether an EHR system is available to receive the results, or if a web application is used.
3.4.3.5	**Action:** Log interaction	

a. Key Assumptions (In addition to general assumptions stated in Scenario 1 - Information flow #1)

1. The laboratory has sent the laboratory result document to the repository and the repository has notified the locator service of the document location.
2. Meta data for the lab result has been recorded in the registry

2. Information Exchange Requirements

a. Triggers

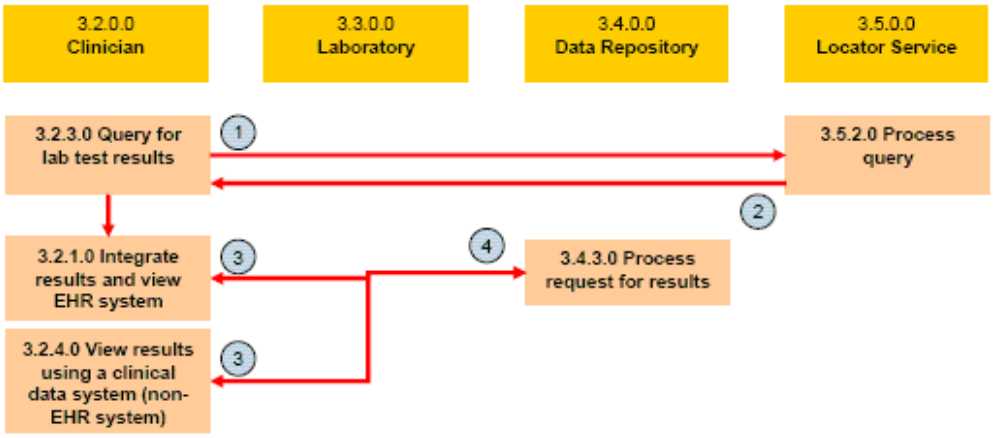
1. There is a clinical need, or other authorized use, for the patient laboratory result(s)
2. Lab – HIE transmissions are triggered by results messages originating from Lab source system(s).
3. HIE – clinical data system interactions are triggered by pull (from clinical data system) or push (to clinical data system)
4. Clinician notification will vary by clinical data system. Common notification schemes include e-mail 'ticklers', clinical data system inbox messaging, etc.

b. Data Content Requirements

Refer to Scenario #1 – Information Flow #1

c. Other unique requirements

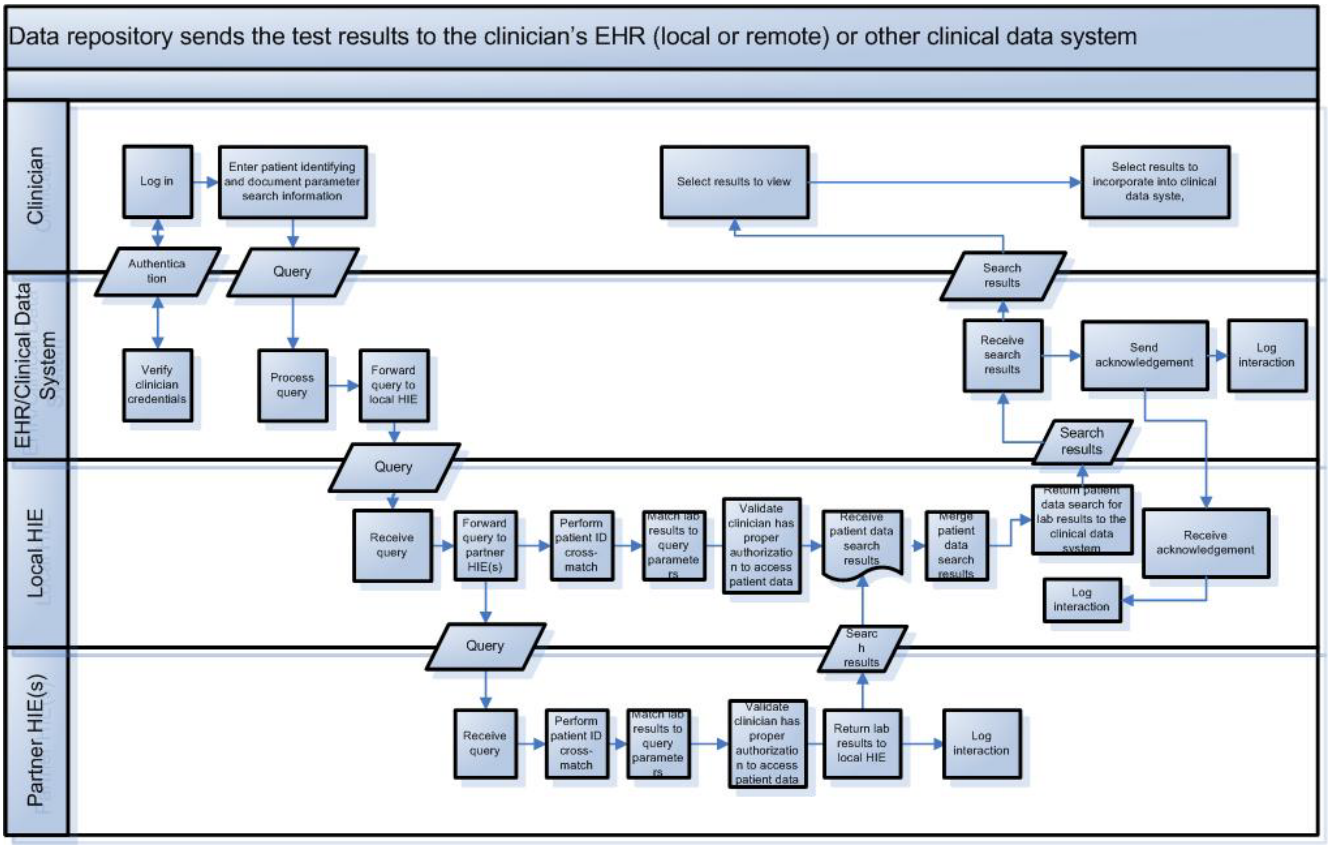
Information Exchange #4: [Data repository sends the test results to the clinician's EHR (local or remote) or other clinical data system: 3.4.3.0, 3.2.1.0 and 3.2.4.0]



1 Information Exchange Workflow

1.1 Workflow Steps and Description

Note: The inter-HIE enactment of this flow requires querying across-HIE partners for historic lab results vs. direct messaging to an EHR with a new lab result. Therefore, the workflow is the same for an EHR, web browser or other clinical data system. These systems will collectively be referred to as the "clinical data system".



1.2 Use Case References (e.g. Events/Actions)

3.4 Data Repository Perspective

Code	Description	Comment
3.4.3.0	**Event: Process Request for Laboratory Test Results**	The data repository receives a request for test result content and verifies the authenticity of the clinician, the integrity of the request, and any restrictions for use. The data repository either sends the test results for integration into the clinician's EHR, or sends the content to another clinical data system for viewing. The secrecy of the content is maintained during transmission.
3.4.3.1	**Action:** Receive and validate the query request	Parse, validate, and acknowledge received data query requests.
3.4.3.2	**Action:** Authenticate and	May include provider identification and validation of

	verify as ordering clinician or provider of care	credentials, privileges and/or other authorization. Authentication and verification may be provided through community or regional services. This may include a trust relationship whereby the clinician is authenticated and authorized once by the community or regional service. The authentication and verification is then carried through the query/retrieval processes.
3.4.3.3	**Action:** Authorize release of laboratory test results	Test results released to clinician based on verification as ordering clinician or provider of care status and other appropriate restrictions for use.
3.4.3.4	**Action:** Transmit lab results of an identified patient to an ordering clinician or provider of care	The means of transport will vary depending on whether an EHR system is available to receive the results, or if a web application is used.
3.4.3.5	**Action:** Log interaction	

3.2 Clinician Perspective

Code	Description	Comment
3.2.1.0	**Event: Integrate results and view in EHR**	
3.2.1.1	**Action:** Receive lab test result as ordering clinician or provider of care	New test results, upon completion, may be sent directly to the clinician's EHR system (local or remote) without an intermediate request action.
3.2.1.1a	**Alternate Action:** Send request for historical lab test result content to data repository(ies)	The clinician selects data repository(ies) from which to retrieve lab test results and sends a request(s). The request may be sent from the EHR system or via web application.
3.2.1.1b	**Alternate Action:** Submit authentication information to the data repository	
3.2.1.2	**Action:** Confirm data integrity of received results	Upon receiving the test result set (messages), the EHR system confirms that the message was received in a complete and unchanged format.
3.2.1.3	**Action:** Parse and validate results content	The EHR system opens and parses each electronic result. Individual records are checked for appropriate information, completeness, proper codes, and patient identifying information.
3.2.1.4	**Action:** Merge data into EHR	The EHR aggregates patient data from each data repository. Each received record is processed and correlated to a patient in the EHR system. Where new results cannot be unequivocally matched with a

		patient, an exception list should be produced to allow human resolution
3.2.1.5	**Action:** New results are flagged within EHR	The EHR system should provide a clear indicator as to the status the review process of all results by clinicians
3.2.1.6	**Action:** Acknowledge receipt of lab results	A message is sent to the lab data repository indicating which results were successfully processed and indicates any results that were undeliverable and unprocessed.
3.2.1.7	**Action:** Log receipt of lab test results	Include patient consent information in log.
3.2.1.7a	**Alternate Action:** Produce exception list of errors	Where inbound lab results records cannot be unequivocally matched with the EHR, an exception list is produced to allow human resolution

Code	Description	Comment
3.2.4.0	**Event:** View results using another clinical data system (non-EHR system)	Not all clinicians will initially have an EHR to view lab test results. The clinician may view lab test results using a clinical data system (non-EHR).
3.2.4.1	**Action:** Send request for lab test result content to data repository(ies)	The clinician selects data repository(ies) from which to retrieve lab test results and sends a request(s). The request is sent via a web application, or other clinical data system.
3.2.4.2	**Action:** Submit authentication information to data repository	Establish clinician's identity and authorization. Note that clinician may be an individual, an organization or "system." The nature of the identification/authentication will be different in each case. One of many authentication methods could be used (biometrics, card, token or user ID and password, cryptographic techniques).
3.2.4.3	**Action:** Receive and view laboratory test results	Lab results are viewed through a web application or other clinical data system.
3.2.4.3a	**Alternate Action:** Print lab results	
3.2.4.3b	**Alternate Action:** Save lab results in local system for viewing at a later time	This action assumes that no EHR system is available. The clinician may wish to save lab results to the local system to review at a later time. This is distinct from importing the data into the EHR.
3.2.4.4	**Action:** Verify correct patient identity and correctness of lab results and error correct if necessary	Upon review of the result, a clinician may see suspect data (e.g. that should be confidential, or may be erroneous). Error correction communication is a manual process.
3.2.4.5	**Action:** Acknowledge receipt of lab results	Upon receipt of the lab result the clinical data system sends an acknowledgement to the NHIE.
3.2.4.6	**Action:** Log interaction with data repository	

1.3 Key Assumptions (In addition to general assumptions stated in Scenario 1 – Information flow #1)

1. All pre-conditions and activities defined in Scenario #1 have been fulfilled.

2. The laboratory has registered the result document in the repository and the repository has notified the locator service of the document location.

3. The NHIE has sent the clinician's request for documents to other NHIEs and has returned to the clinician a list of locations from which to select a lab result to view and or incorporated into their EHR.

2 Information Exchange Requirements

2.1 Triggers

There is a clinical need, or other authorized use for the patient laboratory result(s)

2.2 Data Content Requirements

Refer to Scenario #1 – Information Flow #1

2.3 Other unique requirements