athenahealth

HL7 Clinical Results

Implementation Guide

athenahealth, Inc.
Version 15.7 Published: July 2015

Table of Contents

1. Overview

athenahealth is excited to begin our electronic data exchange partnership with your lab! To ensure that we have all the information we need to best serve your facility and our client's providers, please take the time to review our Clinical Results Interface specifications, detailed in this document. If you have questions please contact your athenahealth Project Manager and refer to our data exchange specifications at: http://www.athenahealth.com/interfaces

2. Implementation Fees

Clinical Results Interfaces are a value---add service offering from athenahealth and therefore are presented at no cost to you or to your ordering providers.

3. Product Description

Clinical Document Interfaces support the electronic transmission of clinical results from a third-party information system into athenaClinicals. This class of interface is designed to allow the unattended transfer and real-time processing of interface messages from a remotely located trading partner system to athenaNet, via the athenaNet Message Exchange (MX) engine. The athenaNet MX engine implements all necessary aspects of message queuing and message processing logic.

The following sections describe what data and processes the athenaNet MX engine is capable of handling, how the athenaNet MX engine handles them, and customer responsibilities, including workflow, maintenance and infrastructure.

Clinical Documents Interface Workflow:

Performing Facility → Lab Results → athenaNet
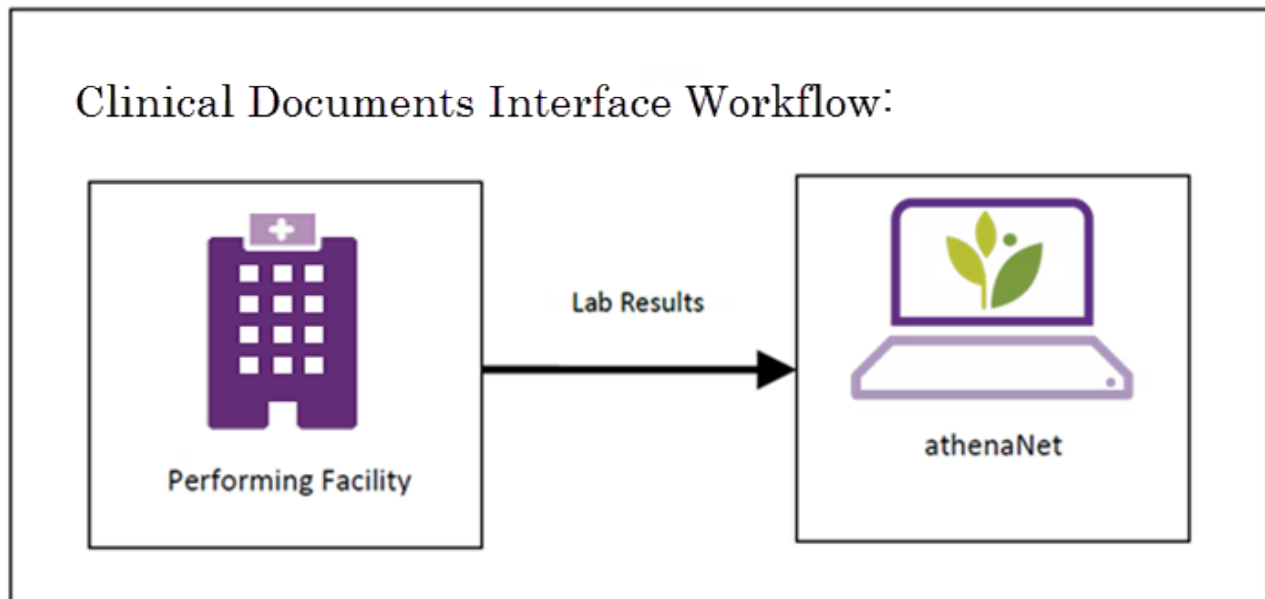
- The direction of the message data transfer is outbound from a third---party trading partner inbound to athenaNet.
- The format of the message data is HL7v2.3.1 ORU, R01, or R03 messages.
- Connectivity is by TCP/IP socket.

- Encryption is by SSH or VPN.

4. Global Architecture

athenahealth develops Clinical Results Interfaces along a "global" message exchange paradigm to leverage our cloud---based software architecture. An interface from your facility delivers messages to our single---instance, multi---tenant messaging engine. Our messaging engine subsequently routes messages to your ordering providers.

In practical terms, this means that your facility can send results to all of your ordering providers who use athenaNet over a single interface. Adding additional providers or practices to an existing interface requires no development or testing.

To implement a global interface, your facility must standardize the following three MSH fields in all HL7 messages. Your facility should identify each separate practice that receives results from with a unique MSH---6 value.

4.1. Global MSH Specs

- **MSH|3** – Sending Application
  - o Used by athenaNet MX Engine to identify the type of result
  - o This can be LAB, PATH, MICRO – any identifier that best describes the type of result
- **MSH|4** – Sending Facility
  - o Used by athenaNet MX Engine to identify the clinical trading partner
  - o For example: Bubbling Brooke Hospital Lab could send "BBROOKELAB"
- **MSH|6** – Receiving Facility
  - o Used by athenaNet MX Engine to identify the ordering provider's practice
  - o Our preferred identifier is the ordering provider's athenaNet context ID, a unique practice---specific numeric value provided by your athenahealth Interface Project Manager.
  - o We can also accommodate your facility's practice---specific identifier (typically the ordering provider's account number at your facility).

5. Message Handling

5.1. Overview

Our standard Clinical Results interface can support the below result types:

- **Clinical Documents –** Provides can receive electronic clinical documents from external trading partnres. This result type can include History & Physical, PreOP Notes, Consultations, Discharge Summary, CDU Admission notes, etc.
- **Clinical Documents with Embedded PDF –** athenaNet can also support Base 64 Embedded PDFs

5.2. Message Formats

The athenaNet MX engine is capable of parsing interface messages formatted

according to the HL7 specification (currently, version 2.3.1 and 2.5 are supported; see *athenaNet MX Native HL7 Interface Specifications* for detailed message specifications).

The athenaNet MX engine can process R01, R03, and ORU messages.

5.3. Sample Messages and Specification

Sample messages are a critical part of scoping an interface and are required to proceed with the scoping of this interface. We expect the sample set will include messages that represent all scenarios this interface will handle. We prefer that the sample messages be pulled from a real operational system, and thus contain real data.

If your sample messages contain PHI, please contact your athenahealth Interface Manager and request that they generate an encrypted email for the exchange of the messages.

5.4. Minimum Requirements

The athenaNet MX engine requires at least the following within the HL7 message to successfully create a result document in athenaNet:

- A practice identifier (see section 4.1)
- Patient information (see section 4.1)
- Provider information (see section 4.1)
- A result order type (OBR.4) and actual result values (OBXs)

5.5. Message Processing: Inbound Messages

5.5.1. Routing Results to athenaNet Departments

Inbound results must be routed to a department ("ordering facility" or physical practice location) enabled on athenaClinicals. The athenaNet MX engine has two options for mapping results to a department:

- Based on the provider in the message. The athenaNet client will need to supply a list of the primary department for each provider (username).
- The sending facility will send a location identifier in the message, and this identifier should be used to route results to the appropriate athenaNet department.

5.5.2. Routing Results to Providers

Based on the provider information sent in the message, the athenaNet MX engine will route results documents to an athenaClinicals provider. The engine will sequentially examine up to eight fields to attempt to match a result to the appropriate ordering provider:

1. OBR-16: Ordering Provider
2. ORC-12: Ordering Provider

3.   OBR-28 : Results Copy To
4.   PV1-7: Attending Doctor
5.   PV1-8: Referring Doctor
6.   PV1-9: Consulting Doctor
7.   PV1-17: Admitting Doctor
8.   PV1-52: Other Healthcare Provider

Each provider is required to have a unique identifier that is included within the sending facilities messages (for example: |ProviderNPI^ProviderLastName^ProviderFirstName|). The preferred provider identifier is NPI number. If your facility is unable to identify providers by their NPI number, athenahealth will require a list of all provider identifiers.

If the athenaMX engine cannot establish a match using the eight fields above, the result will route to a shared username at the practice (STAFF) and be placed into a HOLD status that indicates that practice staff must manually pick an ordering provider.

5.5.3. Patient Matching

The athenaMX engine matches results to a patient based on the below criteria. For automated patient matching to occur, the below three fields in the HL7 message must be identical to the data in the patient's athenaClinicals chart:

- Patient last name (PID-5.1)
- Patient first name (PID-5.2)
- Patient date of birth (PID-7)

If a result does not match to a patient in athenaNet, it will go into a HOLD status in the department staff bucket for the practice to review.

5.5.4. Order Type Mapping – Compendium

athenahealth will request a list of the clinical trading partner's orderable lab test names and the corresponding order codes for each test (the values standardly sent in OBR 4.1 [order code] and OBR 4.2 [local test name]). These order codes and local test names will be matched to an athena Order Type by an outside consultant with clinical lab order expertise. This will facilitate the Tie to Order process (described in 5.3.5) and assure that results are named correctly within athenaNet.

5.5.5. Result Tie-To-Order Requirements

athenahealth will attempt to match inbound clinical results to an open lab order. For results to tie to an order, the following criteria must hold:

1.   The first name, last name and date of birth of the patient in the result must match a patient registered at the practice.
2.   athenaNet must be able to recognize the result type in the message. This means that the order code on the result (OBR---4.1) must be mapped to an athenaClinicals order type.

If both criteria are met, the athenaNet MX engine will attempt to locate a single order to

tie to the inbound result. If it cannot find an open order, the engine will mark the result as unsolicited.

5.5.6. Superseding Logic Requirements

The athenaNet MX engine will process preliminary and final results, as well as corrected results and specimen---rejected messages.

The superseding logic in the engine determines when to overlay new results messages over a previous message. To determine whether a result document will supersede a previously received document, the engine examines OBR---3 (External Accession ID), OBR---4 (Order Code and Name), and the sending facility fields. Individual athenaNet practices may disable superseding logic functionality at the practice level.

athenaNet can also identify result documents that are an exact duplicate of each other and automatically close all but one result. The following criteria must identical for two or more documents to be considered exact duplicates:

- External Accession Identifier
- Tie-to-Order Document ID
- Clinical Provider ID (sending facility)
- Provider username that the documents were sent to

5.5.7. Embedded PDF Requirements

The athenaNet MX Engine can process clinical results messages with embedded PDFs that meet the following requirements:

- PDF encoded in Base---64 and sent using *encapsulated data* datatype (OBX---2 should contain 'ED').
- Each message corresponds to a single result, and contains exactly two OBR segments:
  - The first OBR segment contains discrete analyte values in as many OBX segments as required.
  - The second OBR segment contains a single OBX segment with PDF data in OBX---5.5
  - Both OBR segments have the same accession identifier (OBR---2) and order type (OBR---4).
- For pathology studies – or other result types with textual findings for which there is no discrete data – it is acceptable to send a single OBR segment containing PDF data.

Example OBX segment (OBX---2 contains 'ED', OBX---5.5 contains the embedded PDF data):
OBX| 1| ED| PDF^PDF^ADTX| | ADTX^Img^PDF^Base64^JVBERi0xLjcgCiXi48| | | | | | | | | 20130 204095100|

5.5.8. Result Code Sets

The athenaNet MX Engine uses a standardized set of observation abnormal flags and result statuses derived from the CDC's published code sets. Please refer to the

athenaNet Inbound Global Tables support document on our data exchange specifications
website: http://www.athenahealth.com/_doc/interfaces/athenaNet_Global_Tables_(Inbound).xlsx

6. Message Queue Maintenance

athenahealth's Interface Operations team monitors and maintains the athenaNet message queue, a database that stores messages during interim steps in the parsing and routing process. Message parsing and routing occurs in near---real time; the delay between receipt of a message by the MX Engine and delivery of that message to your ordering providers is typically several seconds.

7. Physical Architecture Requirements

Please refer to the athenahealth Connectivity Guide for any questions regarding the architecture of this interface.

8. Project Plan

8.1. Phase One: Scoping and Connectivity

A kick---off call will be scheduled by athenahealth for this project. The external trading partner's IT and Network contacts are required on this call (if an interface vendor will be used, that contact is also required). The athenahealth Interface Project Manager will work with the external contact(s) to scope the interface and to answer any questions. Once the call has concluded, the athenahealth Interface Project Manager will send the external trading partners an email with the next required actions. If the interface will utilize a VPN connection, the athenahealth Network Team will reach out to the external Network contact after the receipt of the completed athenahealth Connectivity Worksheet.

Action Items:

- athenahealth Interface Implementation Worksheet
- athenahealth Connectivity Worksheet
- Sample HL7 messages
- Compendium

Timeline: Two weeks, after the kick-off call

8.2. Phase Two: Code

Once a connection has been established between athenahealth and the external trading partner, the athenahealth developers will code the interface to the specifications from the **athenahealth Interface Implementation Worksheet**. During this phase, the finalizing of athenaNet table builds, data imports and other general athenaNet tasks will be completed and the interface will be ready to test with real data.

Action Items: The external trading partner should be readily available to answer any questions that the athenahealth developers may have when coding the interface.

Timeline: One week – the athenahealth Interface Project Manager will inform the external trading partner of a target date for coding completion.

8.3. Phase Three: Testing

The athenahealth developer will load the interface to the client's testing environment which athenahealth refers to as Preview. The Interface Project Manager will request that the external trading partner send multiple test results to the Preview environment to validate the interface. The Interface Project Manager will then return 5---10 result copies that should be verified by the external trading partner.

Action Items:

- The external trading partner will send test results into athenahealth's Preview region.
- The Interface Project Manager will return result copies
- The external trading partner will verify that the result copies are satisfactory.

Timeline: One week

8.4. Phase Four: Go Live

Once the interface has been tested and approved by both the athenahealth Interface Project Manager and the external trading partner, the final version of the interface, from Preview, is loaded into Production.

Timeline: 2 business days, barring any unforeseen issues reported by athenahealth or the external trading partner.

8.5. Summary

Phase	Activity	Estimated
Phase One	Scoping and	Two Weeks
Phase Two	Code	One Week
Phase Three	Testing	One Week
Phase Four	Go Live	Two days

Total – 30 days

9. Interface Support

The external trading partner should contact the athenahealth Interface Network Management team to report any suspected interface issues. The athenahealth Interface Network Management team can be reached at InterfaceNetworkManagement@athenahealth.com

10. Appendix A: Scheduled Downtime

The athenaNet MX engine is subject to the same maintenance windows as the

general athenaNet application. Currently, 1:00 --- 4:00 am Eastern Time is reserved every morning for maintenance. By default, all interfaces are shut---off during this time window, and also remain disabled until 6:00 am Eastern Time.

11. Appendix B: Changelog

v1.2.1: Changes to MSH header descriptions.

v1.2.2: Added details on code sets for observation abnormal flag and

result status. v1.2.3: Added detail on result routing.

v1.2.4: Added detail on embedded PDF

requirements. v.1.2.5: Added clarification on

embedded PDF requirements.

v.15.5.12: Rebranded.