

Results Delivery - Outbound (Receiver)

Data Exchange Solution

Implementation Guide

Version 1

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Table of Contents

- Introduction
  - Purpose of Data Exchange Solution
  - Message Content
  - Data Flow
    - Functional Data Flow
- Onboarding
  - Prerequisites
    - Universal Prerequisites
    - Technical Requirements
      - Data Exchange Solution Requirements
      - Other Technical Requirements
  - Provider Based Results Delivery Onboarding Process
  - Technical Connectivity Process
- Specifications
  - Overview
    - Environment
  - General Message Requirements
    - Standard HL7
    - Message Formatting
    - Event Types
    - Provider NPI
  - Specific Segment and Field Definitions
    - OBR-24 Header Requirements
    - OBR-25 Header Requirements
    - Required Segments for ORU and MDM Messaging
    - Specific Segment and Field Definitions
    - Message Header (MSH) Segment
    - Event Type (EVN) Segment
    - Patient Identification (PID) Segment
    - Patient Visit
    - Next of Kin (NK1) Segment
    - Observation/Result (OBX) Segment
    - Observation Request (OBR) Segment
    - Common Order (ORC) Segment
    - Transcription Document Header (TXA)
    - Specimen (SPM)

- Production Support
- Legal Advisory Language
- Appendices

Introduction

Purpose

Supports delivery of real-time clinical results and documents using provider-based routing, allowing timely access to information needed for care coordination and clinical decision-making

Results Delivery is a health information exchange solution that enables the secure, automated routing of clinical diagnostic results from hospitals, health systems, outpatient facilities, etc., to downstream healthcare providers and practices. This solution facilitates timely access to critical patient information, supporting continuity of care and informed clinical decision-making across the care continuum.

The primary purpose of Results Delivery is to streamline the distribution of clinical diagnostic results to healthcare providers who need access to patient information for ongoing treatment and care coordination. By leveraging provider-based routing through the Michigan Health Information Network Shared Services (MiHIN) infrastructure, Results Delivery eliminates manual processes, reduces delays in information sharing, and ensures that healthcare providers receive relevant patient results in a standardized, interoperable format directly into their electronic medical record (EMR) systems.

This solution addresses a fundamental challenge in healthcare delivery: ensuring that providers have timely access to diagnostic information generated at external facilities where their patients receive care. Results Delivery supports improved patient outcomes by enabling providers to make informed clinical decisions based on complete and current diagnostic information.

Results Delivery operates as a hub-and-spoke model where participating hospitals and health systems (sending organizations) transmit clinical results to MiHIN. MiHIN then electronically routes these results to receiving healthcare organizations based on provider National Provider Identifier (NPI) matching logic. This provider-based routing ensures that results are delivered to the appropriate clinical practice or provider group responsible for the patient's ongoing care.

Results Delivery supports the exchange of multiple categories of clinical diagnostic information:

1. **Laboratory Results**
   a. General laboratory tests, cardiology studies, and specialized diagnostic testing
2. **Pathology Results**
   a. Anatomic and clinical pathology reports
3. **Radiology Results**
   a. Diagnostic imaging reports and findings
4. **Transcribed Documents**
   a. Clinical documentation including discharge summaries, progress notes, consultation reports, operative reports, and other narrative clinical content

Message Content

All clinical content is transmitted using Health Level Seven (HL7®) Version 2 messaging standards:

1. **ORU^R01 messages**
   a. Used for laboratory, pathology, radiology, and transcribed clinical documents,
2. **MDM^T02 messages**
   a. Used for transcribed clinical documents

Results may be delivered in multiple formats to accommodate varying EMR capabilities:

1. **Textual results** (preferred)
   a. Human-readable narrative reports formatted as text
2. **Discrete results**
   a. Structured data elements with individual test values, units, and reference ranges
3. **PDF/document-based results**
   a. Formatted documents embedded within HL7 messages

Data Flow



Functional Data Flow

1. A participating organization generates lab results, pathology results, radiology results, transcribed documents, or a combination of these data types and creates an HL7 ORU^R01 or MDM^T02 message containing patient demographics, encounter information, order details, provider NPI, and result data.
2. The source system transmits the message to MiHIN through a supported secure transport method (e.g., LLP over IPsec VPN, REST API, and SFTP).
3. MiHIN receives and processes the message and leverages Provider NPIs to identify the appropriate receiving organization(s) and routing destination.
4. MiHIN routes the applicable result and document data to the designated receiving organization(s) according to their onboarding preferences.
5. The receiving organization receives the routed clinical data and returns an acknowledgment (ACK) through MiHIN to the sending organization.

Onboarding

Prerequisites

Participating organizations must complete legal onboarding prior to beginning the technical onboarding process. Once all required legal agreements are fully executed, the participating organization will proceed to the technical onboarding phase.

Universal Legal Prerequisites

Upon a participating organization indicating interest in onboarding, MiHIN will review the organization's legal status to confirm whether the appropriate agreements are in place. If required legal agreements have not yet been executed, a MiHIN staff member will work with the participating organization to complete the necessary pre-onboarding legal steps.

Prior to initiating technical onboarding, the participating organization must have an executed Participation Agreement or the applicable legacy master data-sharing agreement plus applicable Use Case Exhibits executed. In some cases, execution of a Statement of Work (SOW) may also be required.

To initiate the pre-onboarding legal process, please contact MiHIN's Help Desk by visiting our portal https://mihinhelp.refined.site/portal/50

Data Availability

MiHIN routes results exclusively from organizations that provide data to its system, including lab results, radiology results, pathology results, or transcribed documents. If a participating organization seeks results from a source that is not currently sending data to MiHIN, the organization can request MiHIN to initiate a connectivity request with that source. Establishing the connection remains subject to that organization's willingness and technical ability to exchange data.

Result feeds are consolidated by Health System. MiHIN is unable to implement filters to send results from a specific site within a Health System or grouped feed. This filtering must be managed by the vendor of the participating organization or another designated party.

Lab Compendium

If the participating organization is requesting a lab compendium (or several compendiums), please note that this may extend the onboarding timeline. Furthermore, it is at the discretion of the sending source whether they choose to provide a lab compendium..

Technical Requirements

The following implementation dependencies and technical requirements must be completed for the Results Delivery Data Exchange Solution (DES) to operate in a production environment.

Data Exchange Solution Requirements

Participating organizations are not required to implement additional data exchange solutions beyond Results Delivery. Organizations only need to establish connectivity and meet the technical requirements outlined below.

Other Technical Requirements

Receiving organizations must establish one of two connection types with MiHIN:

1. **IPsec Virtual Private Network (VPN)** — *preferred.* Supports delivery of HL7 messages over Lower Layer Protocol (LLP). The organization completes MiHIN's VPN Connectivity Form, after which MiHIN builds the connection and schedules a connectivity call to bring it up.
2. **Secure File Transfer Protocol (SFTP)** — the organization must provide the file path(s), FTP server and the IP address it resolves to, the port, the username, and the password (transmitted securely).

Results Delivery Onboarding Process

1. Express Interest
    a. Contact MiHIN to express interest in participating in the data exchange solution
2. Legal onboarding
    a. Execute required legal documents (e.g. Participation Agreement, Statement

of Work, etc., if applicable).

3. Kick-off Meeting
    a. Participate in a kick-off meeting with a Customer Success Specialist to review the onboarding process, identify roles and responsibilities of all participating parties, review required documents, address questions, etc.
        i. The participation organization will determine if a lab compendium (or multiple compendiums) is required.
4. Technical/Connectivity documentation exchange
    a. The participating organization will return all required documentation needed to support the onboarding request (e.g. an onboarding contact form, a transport document, etc.).
5. Establish connectivity
    a. The participating organization or vendor will establish connectivity with MiHIN via one of the supported transport mechanisms.
6. Data flow testing
    a. The participating organization or vendor will engage in the exchange of test messages to verify that the message exchange is functioning correctly.
7. Go-Live
    a. Upon successfully completing the testing phase, initiate the transmission of production messages through the MiHIN platform.
8. Two-week post-production monitoring
    a. Following a successful go-live, the participating organization and MiHIN will engage in a two-week post-production monitoring phase. During this period, all parties will observe traffic and other metrics to ensure that data exchanges continue to be successful.
    b. At the end of the two-week post-production monitoring period, any planned changes to message formatting or content that may affect routing or downstream processing should be communicated to MiHIN's Help Desk.

Technical Connectivity Process

MiHIN identifies itself as "transport agnostic," providing various options for organizations to establish technical connectivity for data exchange. Participating organizations should choose one or more connectivity methods to facilitate their data exchange. Currently, MiHIN offers support for the following transport methods:

1. **LLP over IPsec VPN –** Lower-Layer Protocol over Internet Protocol Security

Virtual Private Network

a. The VPN request form from MiHIN needs to be filled out, submitted, and approved by MiHIN. After approval, a pre-shared key will be exchanged between your organization and MiHIN to establish the connection.

2. **SFTP –** Secure File Transfer Protocol
   a. Organizations are required to host an SFTP account, and share File Path(s), FTP Server, IP addresses in test/pre-production and production, ports, username, and password

The following steps detail the technical onboarding process. Additionally, MiHIN will conduct a kick-off meeting with new participating organizations to explore the technical onboarding in greater depth.

1. Before establishing the chosen transport or dispatching any messages (whether for testing or other purposes), onboarding organizations must supply the following information to MiHIN to facilitate a smooth onboarding experience. The required information includes:
   a. Source connectivity information:
      i. LLP over VPN
         1. Source IP (test and production)
      ii. SFTP
         1. File Path(s), FTP server and IP addresses it resolves to in test/pre-production and production, ports, username, and password
   b. A completed Results Delivery Onboarding form
      i. The finalized form will be utilized not only for setup but also to properly configure the result feed(s) based on the receiver's request(s).

2. The participating organization selects one or more transport mechanisms and establishes connectivity, or confirms existing connectivity with MiHIN.
   a. LLP over IPsec VPN
   b. Secure File Transfer Protocol (SFTP)

3. Testing requirements will vary based on the established transport configuration:
   a. LLP over IPsec VPN
      i. Testing will be conducted by having the onboarding facility (or facilities) receive a test message to the pre-production endpoint. MiHIN will monitor outbound traffic for sent messages and return responses will be

sent back to MiHIN upon receipt.

b. SFTP
    i. Testing will be conducted by having the onboarding facility(s) receive a test message to the pre-production endpoint. MiHIN will monitor outbound traffic for sent messages and return responses will be sent back to MiHIN upon receipt.

5. Following successful testing, a go-live will take place. During this phase, configuration settings will be transferred to MiHIN's production environment. This action will trigger a two-week post-production monitoring period.

Specifications

Overview

This section defines the technical specifications for Results Delivery messages received through MiHIN.

Environments

1. MiHIN Pre-Production
    a. **TCP/LLP**
        i. 3.86.61.42

2. MiHIN Production
    a. **TCP/LLP**
        i. 3.230.216.230

We don't host anything for the user for SFTP. They host and we send data to them via SFTP.

Technical Architecture

Routing Methodology

Results Delivery utilizes provider-based routing as the standard and preferred method for directing clinical results to appropriate receiving organizations. The routing logic evaluates National Provider Identifiers (NPIs) contained within result messages and matches them against configured provider-to-practice mappings maintained within the Health Connect platform.

Provider NPIs may be evaluated from multiple fields within HL7 messages, including:

1. Ordering Provider (OBR-16)
2. Attending Provider (PV1-7)
3. Referring Provider (PV1-8)
4. Primary Care Provider (PD1-4)
5. Result Interpreters (OBR-32, OBR-33)
6. Other provider role fields as configured

When a valid provider match is identified, the result becomes eligible for downstream delivery to the associated practice or healthcare organization.

Filtering Customization

The service supports sophisticated filtering capabilities to ensure receiving organizations receive only the result types and categories relevant to their clinical workflows:

1. **Result type filtering**
   a. Organizations can specify which categories of results to receive (lab, pathology, radiology, transcribed documents).
2. **Result status filtering**
   a. Filtering based on result lifecycle status (preliminary, final, corrected, cancelled).
3. **Patient class filtering**
   a. Routing based on encounter setting (inpatient, outpatient, emergency).
4. **Diagnostic service section filtering**
   a. Granular filtering by result subcategories (microbiology, general lab, specific imaging modalities).

Facility-Level Filtering

Results Delivery operates at the health system or organizational feed level and cannot filter results to specific individual facilities within a multi-facility health system. For example, if a receiving organization requests laboratory results from a Health system, they cannot selectively receive results only from a specified hospital while excluding other facilities.

Receiving organizations or their EMR vendors must implement any facility-specific filtering requirements on their end if they need to route, display, or suppress results based on the specific sending facility. Organizations should discuss facility-level filtering requirements with their EMR vendor during the implementation planning phase to ensure their system can accommodate any necessary downstream filtering logic.

Vendor Fees

Please note that MiHIN will not provide financial support for any vendor fees incurred by the participating organizations.

System and Vendor Considerations

During implementation, certain technical or workflow considerations associated with a participating organization's electronic medical record (EMR) or vendor-managed environment may affect configuration, data availability, or implementation timelines. The considerations below reflect known system behaviors and should be reviewed during planning to help ensure appropriate expectations and implementation readiness.

1. Result Data Encoding
    a. Certain receiving systems may only accept Base64 as the value in OBX-5.1 within TRANS result messages and may not support other values.
2. Result Formatting and Special Characters
    a. Certain receiving systems may not properly interpret the \~ delimiter within result messages, which may affect how result information is displayed or processed within the EMR.
3. Field Length Limitations
    a. Certain receiving systems may have field-length limitations that prevent them from accepting values exceeding 30 characters in the PID segment or other specified message fields. For example, a Common Key may exceed the receiving system's supported field length.

These considerations should be evaluated during implementation to determine whether the receiving system's configuration supports the applicable data elements and message formatting.

General Message Requirements

This section defines the technical specifications for Provider-Based Delivery messages transmitted through the MiHIN platform. All messages must conform to HL7 version 2.x standards and include the required segments and fields as specified below.

Standard HL7

All messages must be in standard HL7 following guidelines of formatting depending on which version of HL7 is being sent (2.3, 2.5, 2.5.1, etc.). Messages must adhere to HL7 specifications for:

1. Proper segment delimiters (carriage return)

2. Field delimiters (pipe |)
3. Component delimiters (caret ^)
4. Repetition delimiters (tilde ~)
5. Escape characters (backslash)
6. Sub-component delimiters (ampersand &)

All messages must follow standard HL7 message structure with segments in the proper order as defined by the HL7 specification for the message type being transmitted.

Specific Segment and Field Definitions

This section outlines the specific specifications related to the Results Delivery data exchange solution. It encompasses details on message headers, definitions and parameters for data elements, as well as the specific event or field requirements that apply to submitted messages.

OBR-24 Header Requirements

MiHIN requires all potential values to be transmitted in OBR-24 for every type of result. These values will be converted to the MiHIN standard based on the result type and subsequently placed in the MSH-3 field. The translated values will consist of:

1. "LAB"
2. "LAB-MB"
    a. Indicates Microbiology
3. "LAB-BB"
    a. Indicates Blood Bank
4. "LAB-PATH"
    a. Indicates Pathology
5. "RAD"
6. "TRANS"

OBR-25 Header Requirements

MiHIN requires all potential values to be transmitted in OBR-24 for every type of result. These values will be converted to the MiHIN standard based on the result type. The translated values will consist of:

1. “F”
2. “P”
3. “C”
4. “X”
5. “AU”

PV1-2 Header Requirements

MiHIN requires all potential values to be transmitted in PV1-2 for every type of result. These values will be converted to the MiHIN standard based on the result type. The translated values will consist of:

1. “I”
2. “O”
3. “E”
4. “R”
5. “P”

Required Segments for ORU and MDM Messaging

ORU^R01 (Laboratory, Radiology, and Transcription Results)

Segment	Name	Description
MSH	Message Header	Information explaining how to parse and process the message, including message delimiters, sending and receiving applications, message type, timestamp, and control information
PID	Patient Identification	Patient identifying and demographic information
PV1	Patient Visit	Visit information

		associated with the patient encounter, when applicable
ORC	Common Order	Common order information, including order control, placer and filler order numbers, ordering provider, and order status, when applicable

OBR	Observation Request	Information describing the diagnostic study or laboratory order, including ordering provider, universal service identifier, specimen or exam details, and result status. This segment is repeatable.
OBX	Observation/Result	Clinical observations, laboratory test results, radiology findings, transcription content, or other diagnostic result information. This segment is repeatable.

MDM^T02 (Medical Document Notification)

Segment	Name	Description
MSH	Message Header	Information explaining how to parse and process the message, including message delimiters, sending and receiving applications, message type, timestamp, and control information
EVN	Event Type	Trigger event information for the receiving application
PID	Patient Identification	Patient identifying and demographic information
PV1	Patient Visit	Visit information associated with the patient encounter, when applicable
TXA	Transcription Document Header	Metadata describing the clinical document, including document type, activity date/time, originator, authenticator, document status, and unique document

		identifier
OBX	Observation/Result	Clinical document content or discrete observations associated with the document. This segment is repeatable, when applicable.

Specific Segment and Field Definitions

Usage indicates whether the message element (segment, segment group, field, component, or subcomponent) is required, optional, or conditional in the corresponding message element.

R = Required RA
RA = Required Information if Available
CR = Conditionally Required
O = Optional

Message Header (MSH) Segment

The MSH Segment is used to define the intent, source, destination, and some specifics of the syntax of the message. This segment includes identification of message delimiters, sender, receiver, message type, timestamp, etc.

Field	Name	Requirements
MSH:1	Field Separator	R
MSH:2	Encoding Character	R
MSH:3	Sending Application	O

MSH:3.1	ADT Message Sending Application ID	O
MSH:3.2	Sending Application Universal ID	O
MSH:4.1	Sending Facility ID	CR
MSH 4.2	Sending Facility OID	CR
MSH:5	Receiving Application	O
MSH:6	Receiving Facility	O
MSH:7	Date/Time of Message	R
MSH:8	Security	O
MSH:9	Message Type	R
MSH:9.1	Message Type - Type	R
MSH:9.2	Message Type - Event	R
MSH:10	Message Control ID	R
MSH:11	Processing ID	R
MSH:12	Version ID	R
MSH:13	Sequence Number	O
MSH:14	Continuation Number	O

MSH:15	Ack Type	O
MSH:16	Application Ack Type	O

Event Type (EVN) Segment

The EVN segment is used to communicate trigger event information to receiving applications.

Field	Name	Requirements
EVN:1	Event Type Code	O
EVN:2	Recorded Date/Time	R
EVN:3	Date/Time Planned Event	O
EVN:4	Event Reason Code	O
EVN:5	Operator ID	O
EVN:5.1	ID Number	O
EVN:5.2	Last Name	O
EVN:5.3	First Name	O
EVN:6	Event Occurred	O
EVN:7	Event Facility	O

Patient Identification (PID) Segment

The PID Segment is used as the primary means of communicating patient identification information. This segment contains pertinent patient identifying and

demographic information.

Segment	Name	Requirements
PID:1	Sequence Number	R
PID:2	Patient ID	RA
PID:3.1	Patient ID (Internal ID)	R
PID:3.2	Patient Identifier List Check Digit	O
PID:3.3	Patient Identifier List Code identifying check digit	O
PID.3.4	Patient Identifier MRN Assigning Authority (Identifier System)	R
PID.3.5	Patient Identifier MRN Identifier Type Code	R
PID.3.6	Patient Identifier MRN Assigning Facility	O
PID.4.1	Alternate Patient ID- PID	O
PID.4.4	Patient MRN (Alt Patient ID) Assigning Authority	O
PID.4.6	Patient MRN (Alt Patient ID) Assigning Facility	O

PID:5	Patient Name	R
PID:5.1	Patient Name Last (Family)	R
PID:5.2	Patient Name First (Given)	R
PID:5.3	Patient Name Middle (Second and Further Given)	O
PID:5.4	Patient Name Suffix	O
PID:5.5	Patient Name Prefix	O
PID:5.6	Patient Name Degree	O
PID:6	Mother's Maiden Name	O
PID:7	Date/Time of Birth	R
PID:8	Administrative Sex	R

PID:9	Patient Alias	O
PID:10	Race	RA
PID:11	Patient Address	R
PID:11.1	Address Line 1	R
PID:11.2	Address Line 2	RA

PID:11.3	City	R
PID:11.4	State	R
PID:11.5	ZIP Code	R
PID:11.6	Country	O
PID:11.7	Type	O
PID:11.8	Other Geographic Designation	O
PID:11.9	County	O
PID:11.10	Census Tract	O
PID:12	County Code	O
PID:13	Phone Number- Home	RA
PID:13.1	Telephone Number	O
PID:13.2	Telecommunication use code	O
PID:13.3	Telecommunication Equipment Type	O
PID:13.4	Email Address	O
PID:13.5	Country Code	O

PID:13.6	Area/City Code	O
PID:13.7	Home Phone Number	O
PID:13.8	Home Extension	O
PID:13.9	Home Any Text	O
PID:13.10	Extension Prefix	O
PID:13.11	Speed Dial Code	O
PID:13.12	Unformatted Telephone Number	O
PID:14	Phone Number – Business	O
PID:14.1	Telephone Number	O
PID:14.2	Telecommunication use code	O
PID:14.3	Telecommunication Equipment Type	O
PID:14.5	Country Code	O
PID:14.6	Area/City Code	O

PID:14.7	Business Phone Number	O

PID:14.8	Business Extension	O
PID:14.9	Business Any Text	O
PID:14.10	Extension Prefix	O
PID:14.11	Speed Dial Code	O
PID:14.12	Unformatted Telephone Number	O
PID:15	Primary Language	O
PID:16	Marital Status	O
PID:17	Religion	O
PID:18	Patient Account Number	O
PID:19	SSN Number - Patient	RA
PID:20	Driver's License Number - Patient	O
PID:21	Mother's Identifier	O
PID:22	Ethnic Group	RA
PID:23	Birthplace	O
PID:24	Multiple Birth Indicator	O

PID:25	Birth Order	O

PID:26	Citizenship	O
PID:27	Veterans Military Status	O
PID:28	Nationality	O
PID:29	Patient Death Date/Time	RA
PID:30	Patient Death Indicator	RA
PD1:1	Living Dependency	O
PD1:2	Living Arrangement	O
PD1:3	Patient Primary Facility	O
PD1:4	Patient Primary Care Provider	RA
PD1:4.1	ID	RA
PD1:4.2	Last Name	RA
PD1:4.3	First Name	RA
PD1:5	Student Indicator	O
PD1:6	Handicap	O
PD1:7	Living Will Code	O

PD1:8	Organ Donor Code	O
PD1:9	Separate Bill	O
PD1:10	Duplicate Patient	O
PD1:11	Publicity Code	O
PD1:12	Protection Indicator	O

3.4.4 Patient Visit (PV1)

The PV1 segment communicates information about the encounter during which the result was ordered or performed. In addition to visit-level detail such as patient class and assigned patient location, this segment carries several of the provider fields MiHIN evaluates when determining downstream delivery — including attending (PV1-7), referring (PV1-8), consulting (PV1-9), admitting (PV1-17), and other healthcare provider (PV1-52).

Field	Name	Requirement
PV1:1	Sequence Number	O
PV1:2	Patient Class	R
PV1:3	Assigned Patient Location	O
PV1:4	Admission Type	RA
PV1:5	Preadmit Number	O
PV1:6	Prior Patient Location	O

PV1:7	Attending Doctor	RA
PV1:7.1	ID	RA
PV1:7.2	Last Name	RA
PV1:7.3	First Name	RA

PV1.7.14	Attending Physician Location ID	RA
PV1:8	Referring Doctor	RA
PV1:8.1	ID	RA
PV1:8.2	Last Name	RA
PV1:8.3	First Name	RA
PV1.8.14	Referring Physician Location ID	RA
PV1:9	Consulting Doctor	RA
PV1:9.1	ID	RA
PV1:9.2	Last Name	RA
PV1:9.3	First Name	RA
PV1.9.14	Consulting Physician Location ID	RA

PV1:10	Hospital Service	RA
PV1:11	Temporary Location	O
PV1:12	Preadmit Test Indicator	O
PV1:13	Re-admission Indicator	O
PV1:14	Admit Source	RA
PV1:15	Ambulatory Status	O

PV1:16	VIP Indicator	O
PV1:17	Admitting Doctor	RA
PV1:17.1	ID	RA
PV1:17.2	Last Name	O
PV1:17.3	First Name	O
PV1:17.14	Admitting Provider Location ID	RA
PV1:18	Patient Type	RA
PV1.19.1	Visit Number (Unique Encounter Code)	R
PV1.19.2	Visit Number check digit	O

PV1.19.3	Visit Number check digit scheme	O
PV1.19.4	Visit Number Identifier System (Assigning authority)	O
PV1.19.5	Visit Number Identifier Type - 'VN'	O
PV1:20	Financial Class	O
PV1:21	Charge Price Indicator	O
PV1:22	Courtesy Code	O

PV1:23	Credit Rating	O
PV1:24	Contract Code	O
PV1:25	Contract Effective Date	O
PV1:26	Contract Amount	O
PV1:27	Contract Period	O
PV1:28	Interest Code	O
PV1:29	Transfer to Bad Debt Code	O
PV1:30	Transfer to Bad Debt	O

	Date	
PV1:31	Bad Debt Agency Code	O
PV1:32	Bad Debt Transfer Amount	O
PV1:33	Bad Debt Recover Amount	O
PV1:34	Delete Account Indicator	O
PV1:35	Delete Account Date	O
PV1:36	Discharge Disposition	RA
PV1:37	Discharge To Location	RA
PV1:38	Diet Type	O
PV1:39	Servicing Facility	O

PV1:40	Bed Status	O
PV1:41	Account Status	R
PV1:42	Pending Location	O
PV1:43	Prior Temporary Location	O
PV1:44	Admit Date/Time	RA

PV1:45	Discharge Date/Time	RA
PV1:46	Current Patient Balance	O
PV1:47	Total Charges	O
PV1:48	Total Adjustment	O
PV1:49	Total Payments	O
PV1:50	Alternate Visit ID	O
PV1:51	Visit Indicator	O
PV1:52	Other Healthcare Providers	RA
PV1:52.1	ID	RA
PV1:52.2	Last Name	RA
PV1:52.3	First Name	RA
PV1:52.14	Other Provider Location ID	RA

Next of Kin (NK1) Segment

The NK1 segment communicates information about parties associated with the patient, including next of kin, emergency contacts, and other related persons — name, relationship to the patient, address, and telephone number.

Field	Name	Requirement
NK1:1	Set ID	O

NK1:2	Next of Kin Name	O
NK1:2.1	Last Name	O
NK1:2.2	First Name	O
NK1:2.3	Middle Name	O
NK1:3	Next of Kin Relationship to Patient	O
NK1:4	Next of Kin Address	O
NK1:4.1	Address Line 1	O
NK1:4.2	Address Line 2	O
NK1:4.3	City	O
NK1:4.4	State	O
NK1:4.5	ZIP Code	O
NK1:4.6	Country	O

NK1:4.7	Type	O
NK1:4.8	Other Geographic	O
NK1:4.9	County/Parish	O
NK1:4.10	Census Tract	O

NK1:5	Next of Kin Phone Number	O
NK1:6	Next of Kin Employer Phone Number	O
NK1:7	Contact Role	O
NK1:8	Start Date	O
NK1:9	End Date	O
NK1:10	Next of Kin Job Title	O
NK1:11	Next of Kin Job Code/Class	O
NK1:12	Next of Kin Employee Number	O
NK1:13	Organization Name	O
NK1:14	Marital Status	O
NK1:15	Sex	O
NK1:16	Date of Birth	O
NK1:17	Living Dependency	O

NK1:18	Ambulatory Status	O
NK1:19	Citizenship	O

NK1:20	Primary Language	O
NK1:21	Living Arrangement	O
NK1:22	Privacy Type	O
NK1:23	Protection Indicator	O
NK1:24	Student Indicator	O
NK1:25	Religion	O
NK1:26	Mother’s Maiden Name	O
NK1:27	Nationality	O
NK1:28	Ethnic Group	O
NK1:29	Contact Reason	O
NK1:30	Contact Person Name	O
NK1:31	Contact Phone	O
NK1:32	Contact Address	O
NK1:33	NK1 Identifiers	O
NK1:34	Job Status	O
NK1:35	Race	O
NK1:36	Handicap	O

NK1:37	Contact Person Social Security Number	O
NK1:38	Next of Kin Birth Place	O
NK1:39	VIP Indicator	O

Observation/Result (OBX) Segment

The OBX segment carries the clinical observation itself (the result content) as a single observation or observation fragment, and repeats for each observation reported in the message. It may be followed by one or more NTE segments containing additional notes or comments about the observation. Because this segment holds the result content, it is where the distinction between textual and discrete results is expressed.

Field	Name	Requirement
OBX:1	Set ID	O
OBX:2	Value Type	RA
OBX-3.1	Observation Identifier Code	O
OBX-3.2	Observation Identifier Display	O
OBX-3.3	Observation Identifier System	RA
OBX:4	Observation Sub-ID	O
OBX:5	Observation Value	RA

OBX:6	Units	O
OBX:7	References Ranges	O
OBX:8	Abnormal Flags	O
OBX:9	Probability	O
OBX:10	Nature of Abnormal Test	O
OBX:11	Observation Results Status	RA
OBX:12	Effective Date of Reference Range	O
OBX:13	User Defined Access Checks	O
OBX:14	Date/Time of the Observation	O
OBX:15	Producer's ID	O
OBX:16	Responsible Observer	O
OBX:17	Observation Method	O
OBX:18	Equipment Instance Identifier	O
OBX:19	Date/Time of Analysis	O

OBX:20	Observation Site	O
OBX:21	Observation Instance Identifier	O
OBX:22	Mood Code	O
OBX:23	Performing Organization Name	O
OBX:24	Performing Organization Address	O
OBX:25	Performing Organization Medical Director	O

Observation Request (OBR) Segment

The OBR segment serves as the report header for each result reported in the message and contains information about the order being fulfilled, including the order number, the service or test ordered, and the associated request and observation date/times.

Field	Name	Requirement
OBR-1	Set ID - OBR	R
OBR-2	Placer Order Number	RA
OBR-3	Filler Order Number	RA
OBR-4	Universal Service ID	R

OBR-7	Observation Date/Time	R
OBR-8	Observation End	O

	Date/Time	
OBR-9	Collection Volume	O
OBR-10	Collector Identifier	O
OBR-11	Specimen Action Code	O
OBR-12	Danger Code	O
OBR-13	Relevant Clinical Information	O
OBR-14	Specimen Received Date/Time	O
OBR-15	Specimen Source	O
OBR-16	Ordering Provider	RA
OBR-17	Order Callback Phone Number	O
OBR-22	Results Rpt/Status Change Date/Time	RA
OBR-24	Diagnostic Service Section ID	R

OBR-25	Result Status	R
OBR-26	Parent Result	O
OBR-28	Result Copies To	RA
OBR-32	Principal Result	RA
	Interpreter	
OBR-33	Assistant Result Interpreter	RA
OBR-34	Technician	RA
OBR-35	Transcriptionist	RA
OBR-36	Scheduled Date/Time	O
OBR-37	Number of Sample Containers	O
OBR-38	Transport Logistics of Collected Sample	O
OBR-39	Collectors Comment	O
OBR-40	Transport Arrangement Responsibility	O
OBR-41	Transport Arranged	O
OBR-42	Escort Required	O

OBR-44	Procedure Code	O
OBR-45	Procedure Code Modifier	O

Common Order (ORC) Segment

The ORC segment carries order-level information common to the order as a whole, including the order control code, the placer and filler order numbers, order status, transaction date/time, and the ordering provider. It accompanies the OBR for each order reported in the message.

Field	Name	Requirement
ORC-1	Order Control	R
ORC-2	Placer Order Number	R
ORC-3	Filler Order Number	RA
ORC-4	Placer Group Number	O
ORC-5	Order Status	RA
ORC-6	Response Flag	O
ORC-7	Quantity/Timing	O
ORC-8	Parent Order	O
ORC-9	Date/Time of Transaction	RA
ORC-10	Entered By	O

ORC-11	Verified By	O
ORC-12	Ordering Provider	R
ORC-13	Enterer's Location	O
ORC-14	Call Back Phone Number	O
ORC-15	Order Effective Date/Time	O
ORC-16	Order Control Code Reason	O
ORC-17	Entering Organization	O
ORC-18	Entering Device	O
ORC-19	Action By	O
ORC-20	Advanced Beneficiary Notice Code	O
ORC-21	Ordering Facility Name	O
ORC-22	Ordering Facility Address	O
ORC-23	Ordering Facility Phone Number	O
ORC-24	Ordering Provider Address	O

ORC-25	Order Status Modifier	O
ORC-26	Advanced Beneficiary Notice Override Reason	O
ORC-27	Filler's Expected Availability Date/Time	O
ORC-28	Confidentiality Code	O
ORC-29	Order Type	O
ORC-30	Enterer Authorization Mode	O

Transcription Document Header (TXA)

The TXA segment carries header information for a transcribed document, including the document type, activity date/time, completion and availability status, and the unique document number and appears in MDM messages only.

For MDM messages, TXA5 should follow the same provider formatting convention used for other provider fields.

Example: 1234567890^SMITH^JOHN

Field	Name	Requirement
TXA-1	Set ID - TXA	R
TXA-2	Document Type	R
TXA-3	Document Content Presentation	R
TXA-4	Activity Date/Time	R

TXA-5	Primary Activity Provider	RA
TXA-5.1	Primary Activity Provider - ID	RA
TXA-5.2	Primary Activity Provider - Last Name	RA
TXA-5.3	Primary Activity Provider - First Name	RA
TXA-5.4	Primary Activity Provider - Middle Name	RA
TXA-5.7	Primary Activity Provider - Identifier Type	RA

TXA-6	Origination Date/Time	R
TXA-7	Transcription Date/Time	O
TXA-8	Edit Date/Time	O
TXA-9	Originator Code/Name	O
TXA-10	Assigned Document Authenticator	RA

TXA-10.1	Authenticator - ID	RA
TXA-10.2	Authenticator - Last Name	RA
TXA-10.3	Authenticator - First Name	RA
TXA-11	Transcriptionist	O
TXA-12	Unique Document Number	R
TXA-12.1	Unique Document Number - ID	R
TXA-12.2	Unique Document Number - Assigning Authority	RA
TXA-13	Parent Document Number	RA
TXA-14	Place Order Number	O
TXA-15	Filler Order Number	O
TXA-16	Unique Document File Name	O
TXA-17	Document Completion Status	R
TXA-18	Document	O

	Confidentiality Status	
TXA-19	Document Availability Status	O
TXA-20	Document Storage Status	O
TXA-21	Document Change Reason	O
TXA-22	Authentication Person, Time Stamp	O
TXA-23	Distributed Copies (Code and Name of Recipients)	RA

Specimen (SPM)

The SPM segment carries information about the specimen a result was produced from, including the specimen identifier, specimen type, and specimen collection date and time. It repeats when a result covers more than one specimen. Organizations sending the SPM must follow the HL7 2.5.1 standard.

Field	Definition	Requirements
SPM-1	Set ID - SPM	O
SPM-2	Specimen ID	O
SPM-3	Specimen Parent IDs	O

SPM-4	Specimen Type	R
SPM-5	Specimen Type Modifier	O
SPM-6	Specimen Additives	O
SPM-7	Specimen Collection Method	O
SPM-8	Specimen Source Site	O
SPM-9	Specimen Source Site Modifier	O
SPM-10	Specimen Collection Site	O
SPM-11	Specimen Role	O
SPM-12	Specimen Collection Amount	O
SPM-13	Grouped Specimen Count	RA
SPM-14	Specimen Description	O
SPM-15	Specimen Handling Code	O
SPM-16	Specimen Risk Code	O
SPM-17	Specimen Collection Date/Time	O

SPM-18	Specimen Received Date/Time	O

SPM-19	Specimen Expiration Date/Time	O
SPM-20	Specimen Availability	O
SPM-21	Specimen Reject Reason	O
SPM-22	Specimen Quality	O
SPM-23	Specimen Appropriateness	O
SPM-24	Specimen Condition	O
SPM-25	Specimen Current Quantity	O
SPM-26	Number of Specimen Containers	O
SPM-27	Container Type	O
SPM-28	Container Condition	O
SPM-29	Specimen Child Role	O

Production Support

	Severity 1	Severity 2	Severity 3	Severity 4
Description	A critical production system is down or does not function at all, and there is no circumvention or workaround for the problem; a significant number of users are affected, and a production business system is inoperable.	More than 90% of messages received and delivered successfully, but some messages are not delivered/received with required accuracy. Service component severely restricted in one of the following ways: • High impact risk or actual occurrence of patient care affected or operational impairment • Business critical service has a partial failure for multiple TDSOs • A critical service is online however, is operating in a degregated state and having a significant impact on multiple TDSOs	Service component restricted in one of the following ways: • A component is not performing as documented or there are unexpected results • Business critical service has failed for a two or more TDSOs • A critical service is usable however, a workaround is available, or less significant features are unavailable	No operational impact to MiHIN. A non-critical service component is malfunctioning, causing minimal impact, or a test system is down.
Initiation Method	**Call** (844) 454-2443 and **submit** a ticket online at www.mihin.org/requesthelp	**Call** (844) 454-2443 and **submit** a ticket online at www.mihin.org/requesthelp	**Submit** a ticket online at www.mihin.org/requesthelp	**Submit** a ticket online at www.mihin.org/requesthelp
Acknowledgement Communication	Within **30 minutes**	Within **30 minutes**	Within **3 business hours**	Within **6 business hours**
Resolution Goal	**<2** hours Restore Time from 8 am – 5 pm ET Monday-Friday and **<4** hours nights, weekends and holidays	**<4** hours Restore Time from 8 am - 5 pm ET Monday-Friday and **<8** hours nights, weekends and holidays	**<12** hours Restore Time from 8 am - 5 pm ET Monday–Friday and **<24** hours nights, weekends and holidays	Within **5 business days**

If you have questions, please contact the MiHIN Help Desk:

- www.mihin.org/requesthelp (preferred)
- Phone: 844-454-2443
- Monday – Friday 8:00 AM – 5:00 PM (Eastern Time)

Legal Advisory Language

This reminder applies to all use cases covering the exchange of electronic health information:

The Data Sharing Agreement (DSA) establishes the legal framework under which participating organizations can exchange messages through the MiHIN Platform, and sets forth the following approved reasons for which messages may be exchanged:

1. By health care providers for Treatment, Payment and/or Health Care Operations consistent with the requirements set forth in HIPAA
2. Public health activities and reporting as permitted by HIPAA and other Applicable Laws and Standards
3. To facilitate the implementation of "Meaningful Use" criteria as specified in the American Recovery and Reinvestment Act of 2009 and as permitted by HIPAA
4. Uses and disclosures pursuant to an Authorization provided by the individual who is the subject of the Message or such individual's personal representative in accordance with HIPAA
5. By Data Sharing Organizations for any and all purposes, including but not limited to pilot programs and testing, provided that such purposes are consistent with Applicable Laws and Standards
6. or any additional purposes as specified in any use case, provided that such purposes are consistent with Applicable Laws and Standards

Under the DSA, "***Applicable Laws and Standards***" means all applicable federal, state, and local laws, statutes, acts, ordinances, rules, codes, standards, regulations and judicial or administrative decisions promulgated by any governmental or self-regulatory agency, including the State of Michigan, the Michigan Health Information Technology Commission, or the Michigan Health and Hospital Association, as any of the foregoing may be amended, modified, codified, reenacted, promulgated or published, in whole or in part, and in effect from time to time. "Applicable Laws and Standards" includes but is not limited to HIPAA; the federal Confidentiality of Alcohol and Drug Abuse Patient Records statute, section 543 of the Public Health Service Act, 42 U.S.C. 290dd-2, and its implementing regulation, 42 CFR Part 2; the Michigan Mental Health Code, at MCLA §§ 333.1748 and 333.1748a; and the Michigan Public Health Code, at MCL § 333.5131, 5114a.

It is each participating organization's obligation and responsibility to ensure that it

is aware of Applicable Laws and Standards as they pertain to the content of each message sent, and that its delivery of each message complies with the Applicable Laws and Standards. This means, for example, that if a use case is directed to the exchange of physical health information that may be exchanged without patient authorization under HIPAA, the participating organization must not deliver any message containing health information for which an express patient authorization or consent is required (e.g., mental or behavioral health information).

Disclaimer: The information contained in this implementation guide was current as of the date of the latest revision in the Document History in this guide. However, Medicare and Medicaid policies are subject to change and do so frequently. HL7 versions and formatting are also subject to updates. Therefore, links to any source documents have been provided within this guide for reference. MiHIN applies its best efforts to keep all information in this guide up-to-date. It is ultimately the responsibility of the participating organization and sending facilities to be knowledgeable of changes outside of MiHIN's control.

Appendices

This section contains supplemental reference information, examples, and supporting documentation related to the requirements and processes described in this Implementation Guide.

Appendix A – Lab and Results Compendiums

Some receiving EMRs require a compendium from the sending organization to map and display incoming orders and results correctly. Compendiums are provided and maintained by the sending organization. MiHIN does not create, maintain, or use compendiums for routing but may facilitate their exchange during onboarding.

Appendix B – Message Examples

CBC LAB Test

MSH|^~\&|LIS|MET|NOVO|MET|20250411140930|MHLABBG|ORU^R01|1578|P|2.3|||||||| PID|1||272850^^^MET^MR||BEAKER^SENDOUT||19690119|F|||1337 TAMRIEL BLVD^^GRANDVILLE^MI^49418^US^^^KENT||||||2200021028|546-54-5186|||||||||| PV1|1|O|^^^^^^^^^^|||1548224728^OWENS^LANCE^M^^^^^NPI^^^^NPI|||||||||||O/P|26188521|||||||||||||||||||||||||20250411104801|||||||| OBR|1|222669^|25T-HE1010001^Beaker|LABCBCDIFF^CBC WITH DIFF^^^CBC WITH DIF||20250411|20250411140352|||SALISBRN^SALISBURY^RACHELLE^^||||20250411140606|BLOOD|1548224728^OWENS^LANCE^MContinuing from where I left off:

^M^^^^^NPI^^^^NPI|||||20250411140926||Lab|F||1^^^20250411^^14^^|||||||||20250411|||||||||||||LABCBC^CBC WITH DIFF ORDER PANEL^^^CBC WITH DIF

NTE|1||Release to patient->Immediate|Q|

OBX|1|ST|WC4^WBC^ULTRALRR||15.0|K/uL|4.0-11.0|H|||F||12||8|

OBX|2|ST|RC4^RBC^ULTRALRR||5.00|Million/uL|3.90-5.20||||F||12||8|

OBX|3|ST|HB4^HEMOGLOBIN^ULTRALRR||11.0|g/dL|12.0-16.0|L|||F||12||8|

OBX|4|ST|ht2^HEMATOCRIT^ULTRALRR||35.0|%|36.0-47.0|L|||F||12||8|

OBX|5|ST|MV4^MCV^ULTRALRR||77.0|fL|80.0-99.0|L|||F||12||8|

OBX|6|ST|MH4^MCH^ULTRALRR||26.0|pg|27.0-33.0|L|||F||12||8|

OBX|7|ST|MC4^MCHC^ULTRALRR||31.0|g/dL|32.0-35.5|L|||F||12||8|

OBX|8|ST|RW4^RDW^ULTRALRR||10.0|%|11.0-15.0|L|||F||12||8|

OBX|9|ST|PL4^PLATELET COUNT^ULTRALRR||500|K/uL|135-400|H|||F||12||8|

OBX|10|ST|3510^MPV^ULTRALRR||13.0|fL|7.0-12.0|H|||F||12||8|

OBX|11|ST|4225^NEUTROPHILS % - AUTOMATED^ULTRALRR||60|%|||||F||12||8|

OBX|12|ST|4226^LYMPHOCYTES % - AUTOMATED^ULTRALRR||30|%|||||F||12||8|

OBX|13|ST|4231^MONOCYTES % - AUTOMATED^ULTRALRR||9|%|||||F||12||8|

OBX|14|ST|4232^EOSINOPHILS % - AUTOMATED^ULTRALRR|||||||F||12||8|

OBX|15|ST|4233^BASOPHILS % - AUTOMATED^ULTRALRR|||||||F||12||8|

OBX|16|ST|3597^NEUTROPHILS ABSOLUTE - AUTOMATED^ULTRALRR||9.0|K/uL|1.5-7.7|H|||F||12||8|

OBX|17|ST|3598^LYMPHOCYTES ABSOLUTE - AUTOMATED^ULTRALRR||6.0|K/uL|0.8-5.0|H|||F||12||8|

OBX|18|ST|3599^MONOCYTES ABSOLUTE - AUTOMATED^ULTRALRR||1.0|K/uL|0.1-1.1||||F||12||8|

OBX|19|ST|EO4^EOSINOPHILS ABSOLUTE - AUTOMATED^ULTRALRR||0.0|K/uL|<=0.5||||F||12||8|

OBX|20|ST|3600^BASOPHILS ABSOLUTE - AUTOMATED^ULTRALRR||0.0|K/uL|<=0.2||||F||12||8|

OBX|21|ST|5031^IMMATURE GRANULOCYTES ABSOLUTE - AUTOMATED^ULTRALRR||1.0|K/uL|<=0.1|H|||F||12||8|

OBX|22|ST|5030^IMMATURE GRANULOCYTES % - AUTOMATED^ULTRALRR||1.0|%|||||F||12||8|

OBX|23|ST|7231^NRBC % - AUTOMATED^ULTRALRR|||||||F||12||8|

OBX|24|ST|5058^NRBC ABS^ULTRALRR||0.00|K/uL|<1.00||||F||12||8|

CT Head RAD Test

MSH|^~&|EPIC|2.16.840.1.113883.3.5139^1.3.6.1.4.1.32898.1.4|GLHC|EPIC|20260304084103|020216|ORU^R01|20260304084108589|T|2.3|||AL|NE|||||||||

PID|1|21750465^^^SHCPI^CPI|^^^||EPICTST^FERNANDO^^||19851225|M||K|5450 FORT ST^^TRENTON^MI^48183-4625^US^^^82|82|(734)555-

1212^^PH||FAS|Single||100151682494^^^SH||||2||||||||

PD1|||BHMG RL 6770 DIXIE HWY CLARKSTON
MI^^1002600|1609873496^SAWKA^MARK^W^^^^^^^^^NPI|||||||||||||||||

PV1|1|O-OUTPATIENT|1002151062^^^BHTN4^^^^^BHTN IMAG
CT^^|||||1609873496^SAWKA^MARK^W^^^^^^^^^NPI||||||||||100151682494||||||
||||||||||||||||||20260304090000|||||||V|||

ORC|RE|1189004094^EPC|13026052||CM
Final||^^^20260304083418^20260304083641^3||20260304084103|||1609873496^SAWK
A^MARK^W^^^^^^^^^NPI|1002151062^^^1002151^^^^^BHTN IMAG CT|(734)675-
1280|||||

OBR|1|1189004094^EPC|13026052|IMG182^CT HEAD WITH IV
CONTRAST|3|20260304083348|20260304084052||||Anc
Perform|||||1609873496^SAWKA^MARK^W^^^^^^^^^NPI|(734)675-
1280|1002151062^^^BHTN4^^^^^BHTN IMAG CT||||20260304084052|||CM
Final||||||1699715144^CONN^DONALD^J^^^^^^^^^NPI||026521^LEZOTTE^LAUREN^P^
|103869^YARZA^FERNANDO^O^|20260304090000|||||||70460|

OBX|1|ST|INTERPRETATION|1|A CT Head was performed following intravenous
administration of contrast ||||||CM
Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|2|ST|INTERPRETATION|1|medication.||||||CM
Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|3|ST|INTERPRETATION|1|||||||CM
Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|4|ST|INTERPRETATION|1|No bleed noted. Recommend CT Head follow up in 6
months.||||||CM Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|5|ST|INTERPRETATION|1|||||||CM
Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|6|ST|INTERPRETATION|1|Impression: See Above.||||||CM
Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|7|ST|INTERPRETATION|1|||||||CM
Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|8|ST|NarSuf|2|Exam Begin YARZA, FERNANDO O on Wed Mar 4, 2026 8:34:25 AM
EST||||||CM Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|9|ST|NarSuf|2|Exam End YARZA, FERNANDO O on Wed Mar 4, 2026 8:36:58 AM
EST||||||CM Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|10|ST|NarSuf|2|Transcribed YARZA, FERNANDO O on Wed Mar 4, 2026 8:39:07 AM EST||||||CM Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

OBX|11|ST|AddSuf|2|Signed by: Donald J Conn, MD on 3/4/2026 8:40 AM||||||CM Final|||||026521^LEZOTTE^LAUREN^P^|||||||||||||

Discharge Summary ORU TRANS Test

MSH|^~&|HNAM|HH|ECW|HH|20260310084750||ORU^R01|Q470595707T501734403||2.3|||||8859/1

PID|1|32026|32026|32026|XXTEST^CLINDOC SIX DONOTUSE||19450205|F||R|602 MICHIGAN AVE^^HOLLAND^MI^494234918^USA^^^OTTAWA|OTTAWA|~(646)476-6868^CP||EA|S||7004427|582905830|||U|||0

PD1|||^^0|1790071652^Sumners^Kristen^^DO^^^^^^^^NPI

PV1|1|I|5W^502^1^Holland Hosp|3|||^TEST^P2 Physician Hospitalist 3^^^^^^^^^^NPI|^^^^^^^^^^^^NPI|^^^^^^^^^^^^NPI|MED||||2|||^TEST^P2 Physician Hospitalist 3^^^^^^^^^^NPI|OB||P|||||||||||||||||||Holland Hosp||A|||20260309115231

ORC|RE||f9409089-df49-422c-bdc9-c0a4480056a6^HNAM_CEREF~1640830647^HNAM_EVENTID|||||20260310084749|

OBR|1||f9409089-df49-422c-bdc9-c0a4480056a6^HNAM_CEREF~1640830647^HNAM_EVENTID|10408^Discharge Summary^^^Hospitalist Discharge Note|||20260310084450|20260310084450|||||||||||||20260310084749||MDOC|F|||||||&TEST&P2 Physician Hospitalist 3||&TEST&P2 Physician Hospitalist 3

OBX|1|FT|10408^Discharge Summary||Admission Date.br\ Admit Date: 03/09/2026 11:52 .br\ Day: 0.br\Discharge Date.br\ 3/10/2026.br\Admission Diagnosis.br\ COPD with acute exacerbation.br\ Afib with RVR, unknown chronicity.br\Discharge Diagnosis.br\ Chronic obstructive pulmonary disease with acute exacerbation as evidenced by wheezing, shortness of breath, and hypoxia SpO2 85-88% on room air, possibly due to acute viral infection.br\ -Admit to telemetry.br\ -Chest x-ray negative for acute cardiopulmonary process.br\ -IRPAN pending.br\ -COVID antigen negative.br\ -Supplemental oxygen to maintain SpO2 greater than 90%.br\ -Schedule nebulizer treatments.br\ -Albuterol nebulizers as needed for increased wheezing, shortness of breath, chest tightness.br\ -Continue Spiriva.br\ -Prednisone 40 mg x 5 days.br\ -Cardiopulmonary consult.br\ -Encourage pulmonary hygiene with incentive spirometry and chest physiotherapy.br\ -Strongly encouraged smoking cessation, NRT offered.br\ .br\ Leukocytosis; WBCs 14.4 with left shift.br\ -Trend CBC with differential daily.br\ .br\ Fever, possibly due to viral

etiology.br\ -IRPAN pending, COVID antigen negative.br\ -Received IV Rocephin and Zithromax in the ED empirically, will hold off on further IV antibiotics for now.br\ -Trend CBC as above.br\ .br\ Atrial fibrillation with rapid ventricular rate.br\ -Telemetry monitoring.br\ -Received 10 mg IV diltiazem and 1 L LR in the ED.br\ -Continue Eliquis.br\ -Continue metoprolol with hold parameters.br\ .br\ Coronary artery disease.br\ -Continue aspirin.br\ -Continue prasugrel.br\ -Continue metoprolol with hold parameters as above.br\ -Continue nitroglycerin as needed.br\ .br\ Hypertension.br\ -Continue metoprolol as above.br\ -Continue losartan with hold parameters.br\ -Continue bumetanide and spironolactone with hold parameters.br\ .br\ Chronic diastolic heart failure.br\ -Continue bumetanide.br\ -Continue spironolactone.br\ -Continue metoprolol with hold parameters.br\ .br\ Hyperlipidemia.br\ -Continue atorvastatin.br\ .br\ Type 2 diabetes that is non-insulin-dependent. Current blood glucose 180. Last hemoglobin A1c 8.8 March 2024.br\ -Hold metformin while inpatient.br\ -Gluco scans before meals at bedtime.br\ -Caloric control diet.br\ -Begin basal/bolus insulin pathway.br\ -Diabetic education as needed.br\ -Hemoglobin A1c pending.br\ .br\ Neuropathy.br\ -Continue gabapentin.br\ -Continue Celexa.br\ .br\ Code Status: Code A; full.br\ DVT prophylaxis: Eliquis.br\ GI prophylaxis: Not indicated.br\ Telemetry: Atrial fibrillation with RVR.br\ Gtt: Not indicated.br\ ABX: Not indicated.br\ Foley Catheter: Not indicated.br\ This patient has an anticipated stay of less than 2 midnights for the evaluation and management of the above diagnoses and therefore will be admitted observation status. .br\Procedures Performed.br\ No qualifying data available..br\Hospital Course.br\ HPI: 80 year old Caucasian female with a past medical history of Chronic Obstructive Pulmonary Disease, restrictive lung disease, atrial fibrillation (on Eliquis), coronary artery disease status post PCI LAD August 2023, chronic diastolic heart failure, type 2 diabetes mellitus, hypertension, hyperlipidemia, morbid obesity who presents to Holland Hospital emergency department for evaluation of shortness of breath and generalized weakness since yesterday. Patient reports onset of fever, chills, nonproductive cough, shortness of breath started yesterday. Patient reports shortness of breath persisted through today prompting her to come to the emergency department for evaluation. Patient reports cough is nonproductive but is congested feeling. Patient denies sore throat, sinus congestion, or other upper respiratory symptoms. Patient denies chest pain, palpitations, lower extremity edema, syncope. Patient reports she is normally on 2 L nasal cannula during the day and 3 L nasal cannula at night at baseline at home. Patient denies recent sick contacts. Patient reports 1 episode of nausea and vomiting yesterday, denies none today. Patient denies diarrhea or bloody stools. Patient reports chronic dysuria which she attributes to being on Jardiance, denies hematuria. Discussed plan with patient for admission for observation,treatment with IV antibiotics empirically, treatment of Chronic Obstructive Pulmonary Disease exacerbation, and atrial fibrillation with RVR. Patient in agreement with plan, all questions answered, no further concernsContinuing from where I left off:

at this time.\.br\Allergies\.br\ No active allergies\.br\Discharge Medications\.br\ Prednisone 40 mg daily for 3 additional days\.br\ Azithromycin 250 mg daily for 2

additional days\.br\ Toprol XL from prior 25 mg daily to 50 mg daily \.br\Discharge Instructions\.br\ Follow up with PCP in one week.\.br\Disposition\.br\ Stable\.br\Condition on Discharge\.br\ Stable, back to prior O2 requirements\.br\
\.br\||||||F|||20260310084749||^TEST^P2 Physician Hospitalist 3^^^^^^^PRSNL
NTE|1|SIGN_LINE|Electronically Signed on 03/10/2026 08:47 AM
EDT\.br_____\.br\TEST, P2 Physician Hospitalist 3 Provider Train

GYN Report PATH Test

MSH|^~\&|POWERPATH|PATHOLOGY|||202601121144||ORU^R01|20260112114438|T|2.3|||||
PID|1||031736^^^HH||XXTEST^CODINGLABWRITTENORDERS^LEAH||19980908|F||R|602 MICHIGAN AVE^^HOLLAND^MI^49423-4918^USA|||||S||7003861|245028509||||||||||N
PV1|1|O|HCHO||||1295828820^SMITH^TIMOTHY^V.^^^MD^^^^^^NPI|^^^^^^^^^^^^NPI|^^^^^^^^^^^^NPI|||||||^^^^^^^^^^^^NPI|LAB|7003861|||||||||||||||||||OH||||||202601091111|202601091142 ORC|RE|1195880509|C26-06701||F||||202601121144|SS||1295828820^SMITH^TIMOTHY^V.^^^MD^^^^^^NPI
OBR|1|1195880509|C26-06701|P10012^Gyn Report|||202601091140||||||202601120000|Liquid based Pap smear - Automated screening method|1295828820^SMITH^TIMOTHY^V.^^^MD^^^^^^NPI|||HH
PAP|||202601121144|||F||||||| OBX|1|FT|GYN^|1|CASE: C26-06701|||||F|||202601121144|HLAB OBX|2|FT|GYN^|2|PATIENT: CODINGLABWRITTENORDERS XXTEST|||||F|||202601121144|HLAB
OBX|3|FT|GYN^|3|COLLECTION/SCREENING METHOD: A. Liquid based Pap smear - Automated|||||F|||202601121144|HLAB OBX|4|FT|GYN^|4|screening method|||||F|||202601121144|HLAB OBX|5|FT|GYN^|5|SOURCE: Ectocervical/Endocervical|||||F|||202601121144|HLAB OBX|6|FT|GYN^|6|# OF SLIDES: 1|||||F|||202601121144|HLAB OBX|7|FT|GYN^|7|LMP: None|||||F|||202601121144|HLAB
OBX|8|FT|GYN^|8|||||||F|||202601121144|HLAB
OBX|9|FT|GYN^|9|||||||F|||202601121144|HLAB
OBX|10|FT|GYN^|10|||||||F|||202601121144|HLAB OBX|11|FT|GYN^|11|SPECIMEN ADEQUACY:|||||F|||202601121144|HLAB OBX|12|FT|GYN^|12|Satisfactory for evaluation; insufficient transformation zone component|||||F|||202601121144|HLAB
OBX|13|FT|GYN^|13|present.|||||F|||202601121144|HLAB
OBX|14|FT|GYN^|14|||||||F|||202601121144|HLAB
OBX|15|FT|GYN^|15|INTERPRETATION-RESULT:|||||F|||202601121144|HLAB
OBX|16|FT|GYN^|16|Negative for intraepithelial lesion or malignancy, reactive cellular|||||F|||202601121144|HLAB OBX|17|FT|GYN^|17|changes are present.|||||F|||202601121144|HLAB

OBX|18|FT|GYN^|18|||||||F|||202601121144|HLAB
OBX|19|FT|GYN^|19|||||||F|||202601121144|HLAB
OBX|20|FT|GYN^|20|||||||F|||202601121144|HLAB OBX|21|FT|GYN^|21|Pap smear testing is subject to both false positive and false negative|||||F|||202601121144|HLAB OBX|22|FT|GYN^|22|results as evidenced by published reports. Your patient's test results|||||F|||202601121144|HLAB OBX|23|FT|GYN^|23|should be interpreted in this context, together with the history and|||||F|||202601121144|HLAB
OBX|24|FT|GYN^|24|clinical findings. Periodic pap smear examination can reduce the|||||F|||202601121144|HLAB OBX|25|FT|GYN^|25|chances of false negative results.|||||F|||202601121144|HLAB
OBX|26|FT|GYN^|26|||||||F|||202601121144|HLAB OBX|27|FT|GYN^|27|This specimen has been analyzed by the ThinPrep imaging system|||||F|||202601121144|HLAB OBX|28|FT|GYN^|28|(Hologic), an automated imaging and review system, which assists the|||||F|||202601121144|HLAB
OBX|29|FT|GYN^|29|laboratory in evaluating cells on ThinPrep pap tests. Following|||||F|||202601121144|HLAB OBX|30|FT|GYN^|30|automated imaging, selected fields from every slide are reviewed by the|||||F|||202601121144|HLAB
OBX|31|FT|GYN^|31|cytotechnologist and/or pathologist.|||||F|||202601121144|HLAB
OBX|32|FT|GYN^|32|||||||F|||202601121144|HLAB
OBX|33|FT|GYN^|33|||||||F|||202601121144|HLAB OBX|34|FT|GYN^|34|Final Diagnosis performed by Test Pathologist Electronically signed|||||F|||202601121144|HLAB OBX|35|FT|GYN^|35|01/12/2026 11:44:15 AM|||||F|||202601121144|HLAB

Obstetrics MDM TRANS Test

MSH|^~\&|HNAM|HH|ECW|HH|20260310084750||MDM^T02|Q470595707T501734403||2.3|||||8859/1 EVN|T02|20260310084750
PID|1|32026|32026|32026|XXTEST^CLINDOC SIX DONOTUSE||19450205|F||R|602 MICHIGAN AVE^^HOLLAND^MI^494234918^USA^^^OTTAWA|OTTAWA|~(646)476-6868^CP||EA|S||7004427|582905830|||U|||0 PV1|1|I|5W^502^1^Holland Hosp|3|||^TEST^P2 Physician Hospitalist 3^^^^^^^^^^NPI|^^^^^^^^^^^^NPI|^^^^^^^^^^^^NPI|MED||||2|||^TEST^P2 Physician Hospitalist 3^^^^^^^^^^NPI|OB||P|||||||||||||||||Holland Hosp||A|||20260309115231 TXA|1|DS^Discharge Summary|TX|20260310084450|1790071652^TEST^P2 Physician Hospitalist 3^^^^^^^NPI|20260310084450|20260310084749|||||f9409089-df49-422c-bdc9-c0a4480056a6^HNAM_CEREF||||||DO|||||1790071652^TEST^P2 Physician Hospitalist 3^^^^^^^NPI OBX|1|FT|10408^Discharge Summary||Admission Date\.br\ Admit Date: 03/09/2026 11:52 \.br\ Day: 0\.br\Discharge Date\.br\ 3/10/2026\.br\Admission Diagnosis\.br\ COPD with acute exacerbation\.br\ Afib with RVR, unknown

chronicity\.br\Discharge Diagnosis\.br\ Chronic obstructive pulmonary disease with acute exacerbation as evidenced by wheezing, shortness of breath, and hypoxia SpO2 85-88% on room air, possibly due to acute viral infection\.br\|||||F|||20260310084749||^TEST^P2 Physician Hospitalist 3^^^^^^^PRSNL

CPM LAB Test

MSH|^~\&|CERNER|2.16.840.1.113883.3.4376.100^2.16.840.1.113883.3.4376|LAB|FLT|20260318040151||ORU^R01|Q2708312375T31797303|P|2.3|||||LAB|8859/1
PID|1|310004758756^^^CERN_|310004758756^^^CERN_MRN^MR||ZZTEST^KCITWO||19740917|F||OTHER_RACE|4785 TEST^^DETROIT^MI^48201^US^Home^^Wayne|Wayn|||eng|S|Foursquare Church|71000014386410^^^CERN_FIN|000-00-0000|||UNKNOWN|||0 PV1|1|O|FT12 INF^^^FT12^^Ambulatory(s)^FT12|7|||1871092213^Cerner Test^Physician - Oncologist^Cerner^^^^^NPI||^Cerner Test^Phys OncLAN|IFS||||2|||1871092213^Cerner Test^Physician - Oncologist^Cerner^^^^^NPI|OP||BLUECROSS|||||||||||||||1|||FT||Di|||20260317142522|20260317235959
ORC|RE|8755078294^HNAM_ORDERI|8755078294^HNAM_ORDERI|8755078294^HNAM_ORDERI|CM||1^^^^^R||20260318040143|^SYSTEM^SYSTEM^Cerner||^Cerner Test^Phys OncLAN|MR||20260318040143||||^SYSTEM^SYSTEM^Cerner||MR Laboratory^L^^^^CLIA^CLIA^^A^23D0374006|401 S. Ballenger Hwy^^Flint^MI^48532^USA^B OBR|1|8755078294^HNAM_ORDERI||CMP^Comprehensive Metabolic Panel|||||||||Blood&Blood|^Cerner Test^Phys OncLAN||||0006520260770000001^HNA_ACCN~19238809^HNA_ACCNID||20260318040143||GLB|F||1^Once^0^20260318060000^^S~^^^^^ST - Stat|||||||20260318060000|||||||||Laboratory^Laboratory^^Chemistry^Chemistry
OBX|2|TX|COMMENT^Comment|1|ORDER CANCELLED|||||F|||20260318040143|MR^MR Laboratory|||||||MR Laboratory^^^^^^CLIA