Blood Lead Results
Implementation Guide

Version 1
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Document History

Date	Version	Sections Revised	Description	Modifier
12/7/2024	1	ALL	New Document	A. Pacheco, D, Al-Hussain, M, Allen
7/18/2025	1	All	Updated all sections with the latest information and to conform with current onboarding processes.	M. Allen, T. Fite, M. Gibbs, D. Al-Hussain
8/28/25	1	All	General editing	S. Denhof

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1. Introduction

1.1 Purpose of Data Exchange Solution

> *The Blood Lead Results Data Exchange Solution (DES) enables a Michigan Blood Lead HL7 messaging standard to be used for statewide exchange of Blood Lead information.*

The Blood Lead Results Data Exchange Solution (DES) enables a Michigan Blood Lead Health Level Seven® (HL7®) messaging standard to be used for statewide exchange of blood Lead information. Through this data exchange solution, the Michigan Department of Health and Human Services (MDHHS) will benefit from more timely and complete reporting, improving lead poisoning outcomes and prevention.

By law, the State of Michigan requires what is known as "Universal Blood Lead Testing," wherein all children at 12 and 24 months of age, as well as at other intervals based on exposure risk, undergo blood lead testing. The Public Health Code was updated with these stipulations by adding MCL333.5474d and amending MCL 333.9206. Additionally administrative rules for implementation of the law were made official on April 30, 2025, via R 330.301-304.

This data exchange solution describes the transmission of reportable laboratory findings to local and State health agencies using the HL7 2.5.1 ORU^R01message, specifically for blood lead results, thereby assisting with the execution of the state laws listed above.

1.2 Message Content

Message content is defined for this data exchange solution as an Observation Results (ORU) along with any associated Acknowledgements (ACKs) that conform to HL7 2.5.1 standards.

The current message formats supported are HL7 v2.5.1 (preferred) and HL7 v2.3.1.

1.3 Data Flow

The participating sending organization sends MiHIN an HL7 ORU. MiHIN routes the HL7 ORU message to the Michigan Disease Surveillance System (MDSS) via the State Data Hub at MDHHS.

1.3.1 Functional Data Flow

1.3.1.1 Blood Lead Results Submitter Data Flow

Figure 1. Data Flow for Organizations Submitting Blood Lead Lab HL7 ORUs

1. A participating organization collects blood lead test results from individuals and sends that data to MiHIN in an HL7 ORU Message.
2. MiHIN receives the HL7 ORU and routes it to the State Data Hub and returns an acknowledgement (ACK) to the sending participating organization.
3. The State Data Hub receives the HL7 ORU Message and routes it to the Michigan Disease Surveillance System (MDSS).

1.3.2 Actors

- *Actor:* Participating Organization
  - *Role: The p*articipating organization generates a HL7 ORU and sends it to the Health Information Network (HIN). Receives and ingests Acknowledgement from HIN upon successful receipt of HL7 ORU message.

- *Actor:* State Data Hub (MDHHS)

  - *Role:* Receives HL7 ORU from HIN (MiHIN) and sends it to the Michigan Disease Surveillance System (MDSS).
- *Actor:* HIN (MiHIN)
  - *Role:* Receives HL7 ORU messages from participating organization and generates and returns Acknowledgement (ACK). Routes HL7 ORU messages to the State Data Hub.

You can contact MiHIN at www.mihin.org/requesthelp for more information.

2. Onboarding

2.1 Prerequisites

Participating organizations should begin two parallel onboarding tracks simultaneously:

- Obtain, review, and execute legal agreements, and
- Establish technical transport and testing

2.1.1 Universal Legal Prerequisites

The following legal documentation will need to be executed prior to any connectivity being established between MiHIN and participating organizations:

- Statement of Work (SOW), where applicable
- MiHIN's Exhibit A Agreement (Found on the MiHIN Legal Portal)
- Participant Agreement (Found on the MiHIN Legal Portal)
- Must select the appropriate data exchange solution on the MiHIN Legal Portal in addition to the above agreements

To initiate the legal onboarding contact, email help@mihin.org.

2.1.2 Technical Requirements

- A participating organization must be able to send an HL7 ORU message to MiHIN. Furthermore, the HL7 ORU must be HL7 v2.3 or higher.
- Organizations must be equipped to receive message acknowledgments.
- Organizations connecting to MiHIN for the first time will need to be able to establish a Virtual Private Network (VPN) connection with MiHIN.
- Organizations already connected to MiHIN's HIE Platform for any other non-public health related data exchange solutions via VPN will need to be able to maintain an additional VPN connection:
  - The first VPN connection is to support their participation on the HIE Platform (ITP).
  - The second VPN is specifically used for public health reporting data exchange solutions.
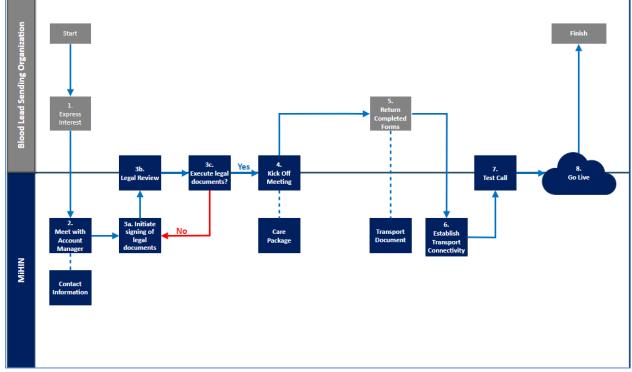
2.2 Blood Lead Results Onboarding Process

Figure 22. Blood Lead Results Onboarding Workflow Diagram for Senders

For participating organizations who will be sending lab results, the onboarding steps are as follows:

- Express interest in participating in the data exchange solution
- Meet with Account Manager
  - Exchange contact information
- Execute legal documents
- Kick Off Meeting with Customer Success Team
  - Blood Lead Results Care Package
- Exchange required documents
  - Transport Document
    - VPN Request Form
- Establish transport method/connectivity (VPN)
- Test Call
  - Test Lab Orders/Results
- Complete Data Quality Assurance (DQA) Process with MDHHS
- Go Live

2.3 Technical Connectivity Process

MiHIN considers itself "transport agnostic" and offers multiple options for organizations to establish technical connectivity to transport data to the HIN. Organizations should select one or more connectivity methods for message transport based on their technical capabilities and should communicate the selection(s) to www.mihin.org/requesthelp early in the onboarding process. Currently the ONLY transport methods MiHIN accepts are:

- **LLP over IPsec VPN** – Lower-Layer Protocol over Internet Protocol Security Virtual Private Network

For VPN connectivity, two VPNs are required. A primary VPN will facilitate regular traffic. A secondary will be established for fail-over purposes.

The following steps describe the technical onboarding process. However, MiHIN typically conducts an "onboarding kickoff" meeting with new organizations to go through each of these steps in detail and answer any questions.

1. The organization selects one or more supported transport methods and establishes connectivity with MiHIN. This step varies based on the method selected:

    a. LLP over IPsec VPN – MiHIN's site-to-site VPN request form must be completed, sent, and approved by MiHIN. Send a request via www.mihin.org/requesthelp to obtain the VPN request form. A pre-shared key is then exchanged between the organization and MiHIN to initialize the connection. The LLP over IPsec VPN is the most efficient transport for very high volumes of messages.

1. Test messages are sent by the participating organizations and routed onto the State Data Hub (MDHHS) in the following manner:
    b. All test messages must have a "T" in the Message Header – Field 11
    c. Test traffic routes via MiHIN to the appropriate destination are defined as follows:
        i.   MSH-5 = MDSS
        ii. MSH-6 = MDCH
2. The end-destination (State Data Hub) monitors for inbound test traffic and confirms receipt with MiHIN via applicable Acknowledgements (ACKs).
3. Once organizations have successfully sent test messages to MiHIN and receive corresponding acknowledgements, testing is considered complete and successful.

4. For the Blood Lead Results Data Exchange Solution, MDHHS deems the sending facility to have entered Data Quality Assurance Status (DQA) once they have successfully received a properly formatted message from the sending organization.
   a. Until the completion of the DQA process, sending facilities should continue to dually send their blood lead results through MiHIN as well as continuing to send using any current method.
5. MDHHS declares the sending facility to be at Production Status after another period of successful testing and existing DQA status.
   a. At this time, the sending facility may then send production messages through the organization to MiHIN. The sending facility now places a "P" (for Production) value in the MSH-11 instead of the "T" used during testing.

3 Specifications

3.1 Overview

3.1.1 Environments

- **Production**
  - Private Rhapsody PROD IP: 172.16.5.125
- **Test**
  - Private Rhapsody TEST IP: 172.16.5.95

3.1.2 Message Trigger Events

The HL7 message type for Blood Lead Results is an ORU and the trigger event is ORU^R01^ORU_R01.

3.2 General Message Requirements

For general rules that apply to the entire message, refer to the MDSS Testing and Submission Guide, located at: https://michiganhealthit.org/wp-content/uploads/MDSS-Testing-and-Submission-Guide.pdf

3.3 Specific Segment and Field Definitions

3.3.1 Segment 1 – Message Header

The definitions in the table below shall be conformed to by all HL7 messages communicating the message header (MSH) segment.

Sequence	Length	DT	Usage	Cardinality	TBL#	RPT/#	Element Name	Comments
1	1..1	ST	R	1..1		1	Field Separator	
2	4..5	ST	R	1..1		1	Encoding Characters	
3	227	HD	R	1..1	0361	1	Sending Application	
4	227	HD	R	1..1	0362	1	Sending Facility	CLIA number

Sequence	Length	DT	Usage	Cardinality	TBL#	RPT/#	Element Name	Comments
5	227	HD	R	1..1	0361	1	Receiving Application	MDSS
6	227	HD	R	1..1	0362	1	Receiving Facility	MDCH
7	26	TS	R	1..1		1	Date/Time of Message	
8	1..40=	ST	O	0..1		1	Security	
9	15	MSG	R	1..1		1	Message Type	ORU^R01^0RU_R01
10	1..199=	ST	R	1..1		1	Message Control ID	
11	3	PT	R	1..1		1	Processing ID	**P** when in production, **T** for testing
12	60	VID	R	1..1		1	Version ID	
13	15	NM	O	0..1		1	Sequence Number	
14	1..180=	ST	O	0..1		1	Continuation Pointer	
15	2..2	ID	CE	0..1	0155	1	Accept Acknowledgment Type	

16	2..2	ID	CE	0..1	0155	1	Application Acknowledgment Type	
17	2..2	ID	O	0..1		1	Country Code	
18	5..15	ID	O	0..*	211	*	Character Set	
19	250	CE	O	0..1		1	Principal Language of Message	
20	3..13	ID	O	0..1	356	1	Alternate Character Set Handling Scheme	
21	427	EI	R	[1..*]		*	Message Profile Identifier	

3.3.2 All Remaining Segments

The message header is the only segment which MiHIN requires to be formatted in a specific way. MiHIN does not evaluate or verify any other part of the message. For all remaining segments and fields, follow MDSS standards, which can be retrieved here: https://michiganhealthit.org/wp-content/uploads/MDSS-Testing-and-Submission-Guide.pdf

4. Production Support

	Severity Levels			
	1	*2*	*3*	*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, operating in a degraded 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 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
Initial Response	Within **30 minutes**	Within **30 minutes**	Within **3 business hours**	Within **6 business hours**
Resolution Goal	**<2** hours Restore Time from 7 am – 6 pm EST Monday-Friday and **<4** hours nights, weekends and holidays	**<4** hours Restore Time from 7 am- 6 pm EST Monday-Friday and **<8** hours nights, weekends and holidays	**<12** hours Restore Time from 7 am -6 pm EST 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
- Phone: (884) 454-2443
- Monday – Friday 8:00 AM – 5:00 PM (Eastern)

5. 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:

a. By health care providers for Treatment, Payment and/or Health Care Operations consistent with the requirements set forth in HIPAA
b. Public health activities and reporting as permitted by HIPAA and other Applicable Laws and Standards
c. To facilitate the implementation of "Meaningful Use" criteria as specified in the American Recovery and Reinvestment Act of 2009 and as permitted by HIPAA
d. 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
e. 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
f. For 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 is current as of the date of the latest revision in the Document History of 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.

6. Appendices

6.1 Appendix A – Message Examples

6.1.1 Message Header Example:

MSH|^~\&|Lab1^1234^CLIA| Hospital X^23D0000000^CLIA|MDSS^
2.16.840.1.114222.4.3.2.2.3.161.1.6377^ISO|
MDSS^2.16.840.1.114222.4.3.2.2.3.161.1.6377^ISO |20160223134754-
0500||ORU^R01^ORU_R01|20160223134754000008|P^T|2.5.1|||NE|NE|USA|||
|PHLabReportAck^^2.16.840.1.114222.4.10.3^ISO

7. Acronyms and Abbreviations Guide

ACK	HL7 Acknowledgment message
DQA	Data Quality Assurance
EHR	Electronic Health Record
FHIR	Fast Healthcare Interoperability Resources
HIE	Health Information Exchange
HIN	Health Information Network
HL7	Health Level Seven
MDHHS	Michigan Department of Health and Human Services
MiHIN	Michigan Health Information Network
OID	Object Identifier
ORU	Observation Result
PO	Participating Organization
SOM	State of Michigan
VPN	Virtual Private Network

8. Definitions

Conforming Message. A message that is in a standard format that strictly adheres to the implementation guide for its applicable use case.

Data Exchange Solution Implementation Guide (IG). The document providing technical specifications related to message content and transport of message content between participating organization, MiHIN, and other TDSOs. Data Exchange Solution implementation guides are made available via URLs in exhibits.

Data Exchange Solution Summary. The document providing the executive summary, business justification and value proposition of a data exchange solution. Data Exchange Solution summaries are provided by MiHIN upon request and via the MiHIN website at www.mihin.org.

Data Quality Assurance (DQA). The systematic process of ensuring data is accurate, complete, consistent, and reliable to support informed decision-making and reliable business operations.

Electronic Medical Record or Electronic Health Record (EMR/EHR). A digital version of a patient's paper medical chart.

Electronic Service Information (ESI). All information is reasonably necessary to define an electronic destination's ability to receive and use a specific type of information (e.g., discharge summary, patient summary, laboratory report, query for patient/provider/healthcare data). ESI may include the type of information (e.g. patient summary or query), the destination's electronic address, the messaging framework supported (e.g., SMTP, HTTP/SOAP, XDR, REST, FHIR), security information supported or required (e.g., digital certificate) and specific payload definitions (e.g., CCD C32 V2.5). In addition, ESI may include labels that help identify the type of recipient (e.g., medical records department).

End Point. An instance of an electronic address or ESI.

Health Level 7 (HL7). An interface standard and specifications for clinical and administrative healthcare data developed by the Health Level Seven organization and approved by the American National Standards Institute (ANSI). HL7 provides a method for disparate systems to communicate clinical and administrative information in a normalized format with acknowledgement of receipt

Health Information. Any information, including genetic information, whether oral or recorded in any form or medium, that (a) is created or received by a health provider, public health authority, employer, life insurer, school or university, or

healthcare clearinghouse; and (b) relates to the past, present, or future physical or mental health or condition of an individual; the provision of health care to an individual; or the past, present, or future payment for the provision of health care to an individual.

Health Information Network (HIN). An organization or group of organizations responsible for coordinating the exchange of protected health information (PHI) in a region, state, or nationally.

Health Provider means facilities/hospitals, health professionals, health plans, caregivers, pharmacists/other qualified professionals, or any other person or organization involved in providing healthcare.

Message. A mechanism for exchanging message content between the participating organization to MiHIN services, including query and retrieve.

Message Content. Information, as further defined in an Exhibit, which is sent, received, found or used by a participating organization to or from MiHIN services. Message content includes the message content header.

Message Header ("MSH") or Message Content Header. The MSH segment is present in every HL7 message type that defines the Message's source, purpose, destination, and certain syntax specifics such as delimiters (separator characters) and character sets. It is always the first segment in the HL7 message, with the only exception being HL7 batch messages.

Michigan Health Information Network Shared Services. The MiHIN for the State of Michigan.

MiHIN Services. The MiHIN infrastructure services and additional services and functionality provided by MiHIN allowing the participating organizations to send, receive, find, or use information to or from MiHIN as further set forth in an exhibit.

Negative Acknowledgment (NAK or NACK). "Not acknowledged" and is used to negatively acknowledge or to reject previously received message content or to indicate an error.

Notice. A message transmission that is not message content and which may include an acknowledgement of receipt or error response, such as an ACK or NACK.

Patient Data. Any data about a patient or a consumer that is electronically filed in a participating organization or participating organization participant's systems or repositories. The data may contain protected health information (PHI), personal credit information (PCI), and/or personal identifiable information (PII).

Person Record. Any record in a MiHIN infrastructure service that primarily relates to a person.

Send / Receive / Find / Use (SRFU). Means sending, receiving, finding, or using message content. Sending involves the transport of message content. Receiving involves accepting and possibly consuming or storing message content. Finding means querying to locate message content. Using means any use of the message content other than sending, receiving and finding. Examples of use include consuming into workflow, reporting, storing, or analysis. Send/Receive/Find/Use (SRFU) activities must comply with Applicable Laws & Standards or State Administrative Code as that term is defined in this agreement and the data sharing agreement.

Service Interruption. A party is unable to send, receive or find message content for any reason, including the failure of network equipment or software, scheduled or unscheduled maintenance, general Internet outages, and events of force majeure.

Source System. A computer system, such as an electronic health record system, at the participating organization, that sends, receives, finds, or uses message content or notices.

Transactional Basis. The transmission of message content or a notice within a period receiving message content or notice from a sending or receiving party as may be further set forth in a specific exhibit.

Use Case Exhibit. The legal agreement is attached as an exhibit to the master use case agreement that governs participation in any specific use case.