Minnesota Electronic Laboratory Reporting HL7 2.5.1 Implementation Guide

DEPARTMENT OF HEALTH

Minnesota Electronic Laboratory Reporting HL7 2.5.1 Implementation Guide

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Version 2

Contents

Introduction

Purpose

The purpose of this document is to provide guidance on Health Level 7 (HL7) 2.5.1 for organizations interested in reporting electronic laboratory data to the Minnesota Electronic Disease Surveillance System (MEDSS). HL7 is a standard messaging protocol used to exchange data between health care data systems. Trading Partners (TPs) interested in ELR reporting must follow the MEDSS HL7 specifications outlined in this guide in addition to the HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1 (US Realm), adopted by the Centers for Disease Control and Prevention (CDC) for all lab reporting. This implementation guide is available for a nominal fee at HL7 V2.5.1 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=98).

Laboratories must submit HL7 version 2.5.1. Hospitals seeking Promoting Interoperability (formerly Meaningful Use) Program (PIP) attestation must submit messages in HL7 version 2.5.1.

Legal Authority

Minnesota Rules Chapter 4605, COMMUNICABLE DISEASE RULE, requires physicians, health care facilities, medical laboratories, and in certain circumstances, veterinarians and veterinary medical laboratories to report disease to the Minnesota Department of Health (MDH). Unless previously reported, every other licensed health care provider who provides care to any patient who has, is suspected of having, or has died from a reportable disease is required to report. Any reference laboratories are also obligated to report to MDH. In addition, any person in charge of any institution, school, childcare facility or camp is required to report communicable diseases to MDH.

For additional information about the rule, please see Communicable Disease Rule (http://www.health.state.mn.us/divs/idepc/dtopics/reportable/rule/rule.html) and Communicable Disease Rule Definitions (http://www.health.state.mn.us/divs/idepc/dtopics/reportable/rule/rule.pdf).

The Minnesota state lead statue section 144.9502 of the Lead Poisoning Prevention Act requires that facilities performing blood lead analyses must report all results to MDH. The statute covers blood lead analyses performed at hospitals, clinics, laboratories, and other facilities on both capillary and venous specimens.

For additional information about the rule, please see MDH Lead Laws and Rules (https:/www.health.state.mn.us/communities/environment/lead/rules/index.html).

Onboarding

Registration

All TPs interested in reporting electronic laboratory data with MDH for MEDSS should follow the instructions on MDH Interoperability and Public Health Reporting (https://www.health.state.mn.us/data/interoperability/index.html) for registration.

Once registered, a confirmation email is sent to the contact person. The TPs are then placed in the waiting queue.

Pre-testing

The MDH will reach out to TPs in the waiting queue when MDH has available resources for onboarding. The ELR Data Exchange Pre-Testing Worksheet will be sent to the TP contact indicated in the MDH Interoperability and Public Health Reporting registration. The information should be filled out and returned to MDH within one month of initial contact. MDH understands that some of the documentation will be in progress, such as the Lab Code and Specimen lists.

Pre-testing involves preparing items to get ready for testing. These include:

- Prepare the Facilities Participating in ELR Onboarding Process worksheet (for organizations with multiple facilities)
- Preparing the PIP Lab Code and Specimen worksheet
- Generating HL7 messages
- Validation HL7 messages through the NIST validator (NIST ELR Validation Testing)

MDH will prioritize TPs with large volumes of reportable diseases.

MDH will provide documentation on reportable diseases and is summarized in the “Labs Reportable by ELR” spreadsheet.

Preparing the Facilities Participating in ELR Onboarding Process Worksheet for Organizations with Multiple Facilities

MDH asks that TPs that submit on behalf of multiple facilities fill out the Facilities Participating in the ELR Onboarding Process worksheet. This is a companion document to the ELR Data Exchange Pre-Testing Worksheet. TPs that are not submitting on behalf of multiple facilities do not need to fill this form out.

List the facility names as they appear on the PIP registration. Provide the address and CLIA number for each facility along with the primary contact information. Complete forms should be returned to MDH with the ELR Data Exchange Pre-Testing Worksheet.

This will be on the ELR Data Exchange Pre-Testing Worksheet, underneath the Interface Information Section, question F.

Preparing MU Lab Code and Specimen Worksheet

MDH requires a complete Lab Code list from each TP. This is a detailed mapping table from a TP of all the test codes and text and the associated reportable test result code and text that will be coming from your lab system. The table must contain a list of the LOINC codes for the lab test codes, the LOINC Long Name for the text, a SNOMED-CT code for the result code and the SNOMED-CT Fully Specified Name for the test result. MDH expects every result that is not a value to have a SNOMED-CT code and the Fully Specified Name for the text. For every test in the table that is not a numeric value there must be at least one result. Minnesota Department of Health is looking for test/result pairs and those pairs are then associated to a reportable disease.

If the result is a value, then a SNOMED-CT code will not be included in your Lab Code list, but the LOINC codes are still required to be on the Lab Code list. Examples would include:

- Titers should always be ratios
- Ratios in lab results are demonstrated by using a colon
- Units/volume will always be numbers with decimal points

MDH realized that many TPs are only using local codes and local text and because of this will need to do some extensive mapping on the TP's side to provide the appropriate information in their HL7 message. Use of local codes and text is allowed to be sent in conjunction with standard codes, but must only be sent in the 2nd triplet of OBR.4 (Universal service identifier), OBX.3 (Test Name), OBX.5 (Test Result), SPM.4 (Specimen Source), or SPM.8 (Specimen Site) fields. OBX.5 (Test Result) field will only contain coded values when the data type indicated it is coded (CWE or CE).

This worksheet should also include a comprehensive list with both specimen sources and specimen types including SNOMED-CT codes and the SNOMED-CT Fully Specified Name.

MDH will require a completed Lab Code list once the facility starts the onboarding process. MDH will not test/validate messages until this is complete as MDH will upload these codes into our system for testing.

Assistance with LOINC and SNOMED-CT lists can be found utilizing the resources indicated in the Helpful Resources section.

Generating HL7 Messages

HL7 is short for Health Level 7, which refers to a set of standards for creating a message to send health information from one health organization to another. Example HL7 message can be found in Appendix D. HL7 messages are divided up into segments. Segments are logical groupings of data fields. Each segment is named and is identified by a segment ID that is a three-character code. The MDH obtains information from the following HL7 ELR segments:

- FHS – File Header Segment
- BHS – Batch Header Segment
- MSH – Message Header Segment
- SFT – Software Segment
- PID – Patient Identification Segment
- NK1 – Next of Kin Segment

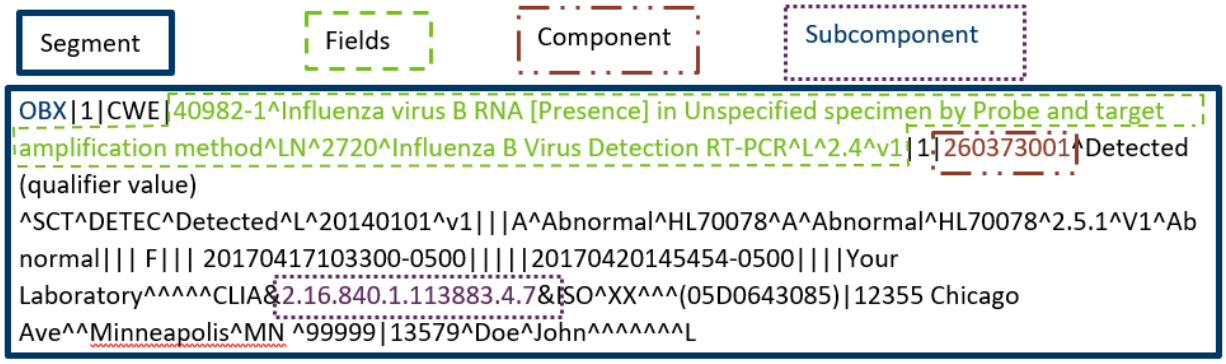
- PV1 – Patient Visit Information
- ORC – Common Order Segment
- OBR – Observation Request Segment
- OBX – Observation/Result Segment
- SPM – Specimen Segment
- NTE – Notes and Comments Segment
- BTS – Batch Trailer Segment
- FTS – File Trailer Segment

Segments are composed of fields, which are a string of characters. Fields are logical groupings of items that comprise the contents of a coded or composite field. Fields are separated by pipes (|).

Fields are composed of components. Within a field having several components, not all components are necessarily required to be populated. If a component is not required, but the next component is, a component delimiter is required to indicate an empty field and to move onto the next field. Component delimiters are carets (^).

Components can be composed of subcomponents. Not all subcomponents are necessarily required to be populated. If a subcomponent is not required, but the next subcomponent is, a subcomponent separator is required to indicate an empty subcomponent. Subcomponent separators are ampersands (&).

Image 1 indicates the different parts of a single segment.



If a field, component, or subcomponent requires the use of a HL7 special character, an escape character in the table below must be used instead.

HL7 character	Escape character to replace
| (field separator)	\F\
^ (component separator)	\S\
& (subcomponent separator)	\T\
~ (repetition separator	\R\
\ (escape character)	\E\

For example, if the facility's name is "Johnson & Doe", the HL7 message text is as followed: Johnson \T\ Doe. This is also true in comment fields if a user is attempting to use the repetition separator to substitute the word, approximate. "The parasitemia value is ~ 0.7%" should be sent as "The parasitemia value is approximately 0.7%" or "The parasitemia value is \R\ 0.7%".

Segments must end with a carriage return at the end of every segment. Carriage returns are sent as \r.

Validation of HL7 messages through NIST validator

The National Institutes of Standards and Technology (NIST) ELR validation tool is the recommended and preferred tool used by MDH for message validation (See Helpful Resources). The NIST tool can provide detailed feedback on test messages to instruct TPs on proper message construction. Test messages should be constructed according to the specification identified in HL7 version 2.5.1 Implementation Guide. Please note that the NIST tool is a general tool for all states to use and is not Minnesota specific.

A feature of this website allows for a pre-validation (both structural and vocabulary/content validation) of standard HL7 messages. A PDF report documenting the errors in the HL7 message can be downloaded. MDH will request the PDF reports from TPs once the onboarding process begins indicating that the first steps in constructing messages have been achieved. Use of the NIST tool allows TPs to achieve a high-level of compliance with the HL7 message standard as quickly as TP resources allow, without requiring feedback from MDH.

Any TP pursing PIP for ELR is directed to use the NIST ELR validation tool as the initial step before contacting MDH for test message validation. TPs can review and correct errors in the EHR generating the test message or changes can be made directly to the message in the Message Content window to clarify the meaning of the error message, if necessary. Test messages sent to MDH should not be manually manipulated in the Message Content window, but re-generated from the TP's information system.

MDH will not test/validate ELR messages until NIST errors are below fifteen errors per message. Once messages are below fifteen errors, download the PDF formatted report and submit to MDH via email. Reports can be emailed to health.ElectronicDiseaseReporting@state.mn.us.

A more extensive test and validation of messages will be done by MDH during the onboarding process.

Testing/Validation

During this step, MDH will invite TPs to onboard and work with them toward achieving ongoing submission of production data. Laboratories connect to MDH's secure transport, send test messages, connect their test systems to the MDH test system, complete the Lab Code and Specimen Lists, and review feedback provided by MDH on daily message submission. When this step is successfully completed, laboratories will receive an invitation from MDH to go-live with their ELR interface.

Completion time to get through testing and validating depends on multiple factors and can take anywhere from a few months to over a year to complete. One way to decrease time in testing is to work on documentation, like the Lab Code list and complete them prior to onboarding. Many TPs find this to be a time-consuming task.

Kick-off call

After sending the invitation to onboard, MDH will schedule a telephone call to discuss the process and establish timelines. Answers in the ELR Data Exchange Worksheet will be reviewed. Timelines may correspond with follow up phone calls.

Some suggested attendees include the contact person for the laboratory, the Laboratory Director, an IT specialist working on the ELR implementation, an ELR team member from MDH, an infectious disease representative and a technical specialist from the laboratory system vendor.

Some TPs find it helpful to set up re-occurring calls to discuss problems and provide progress on deadlines. Biweekly or monthly calls are recommended.

Test Message Validation through Email

The MDH team will review test messages and verify that the LOINC and SNOMED CT codes are valid and that message structure is accurate. Questions will be sent back to TPs for further clarification and corrections. When this review is complete, MDH will send an email to the TP inviting them to begin sending messages to MDH's test system.

Secure Transport

The Public Health Information Network Messaging System (PHINMS) is currently the preferred way of sending data directly to MDH. PHINMS is a free secure file transfer system offered by CDC. MDH technical assistance to help TPs install and configure PHINMS is limited. For more information, visit the CDC website on PHINMS (https://www.cdc.gov/phin/tools/phinms/installation.html).

If TPs do not wish to connect using PHINMS or directly to MDH, TPs can connect with the Minnesota Health Information Exchange (HIE), Koble. To learn more, see State-Certified HIE Service Provider (https://www.health.state.mn.us/facilities/ehealth/hie/certified/koble.html).

Batch Transmission of ELR Messages

The HL7 Batch Protocol may be utilized with HL7 messages to make messaging through PHINMS more efficient. Batch messages will start and end with specific HL7 segments. The File Header Segment (FHS) and Batch Header Segment (BHS) begin the Batch Message followed by one or more HL7 messages. The transmission will end with the Batch Trailer Segment (BTS) and the File Trailer Segment (FTS).

Segment in Standard	Name	Usage	Notes
FHS	File Header Segment	R	File header required
BHS	Batch Header Segment --Batch begins	R	One batch per file supported
	--MESSAGE begins	R	One or more messages per batch supported
MSH	(one or more HL7 messages)	R	
BTS	Batch Trailer Segment --Batch ends	R	

Segment in Standard	Name	Usage	Notes
FTS	File Trailer Segment	R	

More details on how to format these specific segments can be found in Appendix C.

MDH Validation of Lab Report List through Electronic Transmission

During this testing stage, the TP will be sending test messages to MDH through the electronic connection set up between test systems. The messages will consist of all the tests and results combinations that the lab presented in its lab code list. MDH will review the messages to ensure the format and content follow MDH requirements. MDH and TPs will work together to address submission problems that do not meet message structure and content requirements.

For diseases of low burden, test cases may need to be entered and transmitted.

Testing Probationary Period

Once TP test data and the secure transport are established and valid, the TP will send production data to the MDH test system, which means that the probationary period is underway. TPs are required to send messages daily and MDH will send daily reports indicating success, failure, or absence of data. This process will continue until MDH has a successful sampling of all messages listed on the lab code list. TPs are expected to respond within two business days to failures.

Production

Probationary Period

Once the TP accepts the notice for production onboarding from MDH, the testing probationary period ends. MDH obtains the PHINMS sign off and the changeover to the production system takes place. This is the start of the production probationary review. During this production probationary period, MDH will review daily submissions for errors and omissions. The timeline of this stage varies depending on the volume and variety of messages sent by the TP but will be established between MDH and TP before the start of the production phase.

During this time, the TP should continue to send paper and faxed reports to MDH (parallel testing). At the close of the established timeline, MDH will review if the TP can cease the production probationary period or if it needs to be extended. When the production probationary period is finished, MDH will sign off and notify the TP to stop sending paper and faxed copies of reportable laboratory results.

Production - Live

Once the TP is live with production data, MDH will continue to reach out to the TP contact(s) to get messages corrected or follow up on missing laboratory data. If a correction is requested, please re-transmit the ELR in the next available file.

MDH would appreciate communication when any changes or upgrades occur with your system or transmission to monitor accuracy of reporting.

Frequently Asked Questions

Question: MDH receives labs from our reference laboratory, do we also need to send reference lab results?

Answer: Yes. MDH realizes that many facilities may send specific tests that their facility is unable to perform out to reference laboratories. Once a reference lab performs the test and results in a reportable disease, the reference lab will then send the information back to the requesting facility. The reference lab will also send the reportable information to MDH per reportable disease requirements, but reference labs are not required to meet PIP HL7 2.5.1 requirements.

While this may feel like duplicate reporting, some information is not passed from your laboratory information system to the reference facility such as patient demographic information. Different information is required to be transmitted to a reference lab for the specimen to be tested than is required to be reported to MDH. This means that not all required information for public health to follow up on a lab result is sent to the reference lab, which means it's not reported to the state of Minnesota unless the requesting facility reports too.

Question: Can we send messages in real time rather than batch files?

Answer: MDH prefers batch files sent at least once daily or scheduled times throughout the day. A batch file must include batch header segments. This helps MDH to determine when there are problems with data transmission if MDH is aware of when files will be received.

Question: After filling out the data exchange worksheet, it sounds like we should only be sending certain results (MN residents, inpatient results, from specific specimen sources). Can you clarify on this?

Answer: MDH is only looking for MN residents to be reported to MDH. The expectation would be that if the patient was from another state, that the TP would be making that notification per the other state's reporting requirements.

Hospitalization status and specimen filter get into more detailed nuances of reporting for some conditions. MDH will work with the TP on clarifying the reporting criteria for those specific pathogens.

Question: What if there is not a valid SNOMED code for the specimen source or specimen type? Will MDH be able to consume the message or will the message fail?

Answer: Both Specimen Type and Specimen Source should be valid SNOMED-CT codes. If a SNOMED-CT code is not available, we ask that the TP add the code and text associated with the code to the lab code list and specimen spreadsheet. That way, MDH can either assist in finding a code or discuss alternative options. If the Specimen Type (SPM.4) does not contain a valid SNOMED-CT code in the first triplet, the message will fail.

Question: How long would you estimate it will take from start to finish?

Answer: This is not easy to estimate because each TP has different resources and volume of laboratory results that effects the length of time. It is important for the TP to work with MDH to establish a realistic timeline based on resources available. Overall time will be more than 6

months, usually varying from 9 – 18 months. The best way to cut down on onboarding time is to fill out the pre-testing paperwork early and completely.

Helpful Resources

HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1 (US Realm)

There is a nominal fee to download it.

The HL7 Version 2.5.1 Implementation Guide (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=98)

National Institute of Standards and Technology (NIST) Electronic Lab Reporting Validation Suite website – Documentation and Sample Messages

NIST validation testing is for organizations that plan to submit HL7 V2 2.5.1 ELR messages. This tool allows for pre-validation (including structural and limited vocabulary/content validation) of standard HL7 messages. Users can download a validation report documenting detailed review of HL7 test message.

NIST Validation Tool (https://hl7v2-elr-testing.nist.gov/mu-elr/)

Logical Observation Identifiers Name and Codes (LOINC)

LOINC is a database and universal standard for identifying medical laboratory observations. Regenstrief, the creator of LOINC codes, has created a tool called RELMA to assist in mapping of local laboratory test codes to LOINC codes. Codes are added twice a year.

LOINC Database (http://loinc.org/)

RELMA mapping tool (http://loinc.org/relma)

Systemized Nomenclature of Medicine – Clinical Terms (SNOMED-CT)

A comprehensive clinical terminology, originally created by the College of American Pathologists. SNOMED codes are coded answers that can be used for results, procedures, and specimen information. The U.S. National Library of Medicine distributes the US Edition which can be downloaded with a license.

SNOMED-CT US Edition (https://www.nlm.nih.gov/healthit/snomedct/us_edition.html)

SNOMED codes relevant for ELR are found in the Reportable Conditions Mapping Table (RCMT). The latest version can be found and/or downloaded from the PHIN VADS Hot Topics section underneath, “RCMT”.

PHIN VADS (https://phinvads.cdc.gov/vads/SearchHome.action)

SNOMED single code search (http://www.snomedbrowser.com/)

Object Identifiers (OIDS)

OIDS are required for all fields identified as Universal Identifier in the HL7 v2.5.1 guide. Each TP submitting or receiving a message must have an assigned OID. Likewise, each LIMS and software data system from which information is obtained to construct the message must have assigned OIDS. OIDS must be obtained if it is not already available. Check with your electronic health record (EHR) system administrators for OIDS already assigned to your organization.

Learn more about registering or getting an OID through the Introduction for the HL7 OID Registry (https://www.hl7.org/oid/)

Centers for Medicare and Medicaid Services (CMS) maintains a list of external Clinical Laboratory Improvement Amendments (CLIA) (https://www.cms.gov/Regulations-and-Guidance/Legislation/CLIA/CLIA_Lab_Demog_Info), which are a type of OID.

Public Health Information Network (PHIN) Vocabulary Access and Distribution System (VADS)

PHIN VADS are groupings of related codes needed in the electronic transmission of data put together by the Centers for Disease Control and Prevention (CDC). The PHIN VADS associated with ELR value sets can be found in the ELR HL7 2.5.1. References to these codes can be found in the Quick Reference of data elements required in the Appendix.

PHIN VAD Database (https://phinvads.cdc.gov/vads/SearchVocab.action)

Appendix

Appendix A: Common Acronyms

Acronym	Spelling
CDC	Centers for Disease Control and Prevention
CLIA	Clinical Laboratory Improvement Amendment
CMS	Center for Medicare and Medicaid Services
EHR	Electronic Health Record
ELR	Electronic Laboratory Reporting
HL7	Health Level Seven
ISO	International Organization for Standards
LIMS	Laboratory Information Management System
LOINC	Logical Observation Identifiers Names and Codes
MEDSS	Minnesota Electronic Disease Surveillance System
MDH	Minnesota Department of Health
NIST	National Institute of Standards and Technology
OID	Object Identifier
PHINMS	Public Health Information Network Messaging System
PHIN VADS	Public Health Information Network Vocabulary Access and Distribution System
RCMT	Reportable Conditions Mapping Table

Appendix B: HL7 2.5.1 Quick Reference of Data elements required

In this guide, elements highlighted in green are required for effective reporting for both general communicable diseases and blood lead. Elements highlighted in purple are required for effective reporting for blood lead and elements highlighted in blue are required for effective reporting for general communicable diseases. The table is compiled of elements that are required to conform with HL7, Minnesota state regulations or fields that are helpful for public health surveillance.

Not all components are listed. It is important to note the sequence number in order to format the HL7 2.5.1 message correctly. If a field is missing, a field delimiter (|) must be used to indicate a blank field. If a component is missing, a component delimiter (^) must be used to indicate a blank component. If a sub-component is missing, a sub-component delimiter (&) must be used to indicate a blank sub-component.

Some components and sub-components utilize value sets that are pre-defined. Value sets beginning with "HL7" reference the Value Set/Code System Name that is defined in the HL7 Version 2.5.1 Implementation Guide (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=98). Value Sets beginning with "PHVS_" reference Value Sets that can be found on the CDC's PHIN VAD website (https://phinvads.cdc.gov/vads/SearchHome.action). While links to the specific value set are provided, TPs should use the most recent version.

Below describes the structure of the table:

Seq: Sequence of the element as they are numbered in the HL7 segment.

Usage and Repeat:

- R = Required. Must always be populated.
- RE = Required, but can be empty. This means that if the sending application has the data, you need to send it.
- C(R/X) = If the condition predicate associated with the element is true, then the usage for the element is "R" (Required). If the condition predicate associated with the element is false, then the usages for this element is "X" (Not Supported).
- C(RE/X) = If the condition predicate associated with the element is true, then the usage for the element is "RE" (Required, but can be empty). If the condition predicate associated with the element is false, then the usage for the element is "X" (Not Supported).
- C(R/RE) = If the condition predicate associated with the element is true, then the usage for the element is "R" (required). If the condition predicate associated with the element is false, then the usage for the element is "RE" (Required, but can be empty).
- O = Optional. These are items that are nice to have

- * = Repetition. This section can be repeated to send more information. To send more than one repetition, the information is separated by a tilde (~).

Data Type: Data type used for HL7 elements, components and sub-components such as string, numeric, etc.

- CWE = coded with exception; coded value may be selected from the coding system designated in the HL7 element definition.
- CX= coded value
- DR = Date/Time Range; structure should follow YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]
- EI = Entity Identifier; identifier assigned by an application.
- EIP = Entity Identifier Pair; used in linking parent and child results together
- FT = Formatted Text; allows for formatting escape sequences
- HD = Hierarchic Designator; identifier is usually for applications and assigning authorities (Namespace ID^Universal ID^ Universal ID Type)
- ID = Coded Value; identifier that communicates a value from an HL7-defined table. The table is listed in the Notes section.
- IS = Coded Value; identifier that communicates a value from a user-defined table. The table is listed in the Notes section.
- MSG = Message Type
- NM = Numeric; allows zero or more numeric characters including optional plus (+) or minus (-) sign and an optional decimal point.
- PL = Person location
- PRL = Parent Result Link
- PT = Processing Type
- SAD = Street address
- SI = Sequence Identifier; a positive whole number used to identify the ordinal position of a repeating segment within a message
- ST = String text; brackets [] are used for string text to indicate the minimum and maximum character limit.
- TS = Time Stamp (Date & time); structure should follow YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]
- VID = Version Identifier
- XAD = Address; used to communicate the physical address of a person, patient or organization
- XCN = Person name and ID; coded value that communicates he identify of patients and persons
- XON = Organization Name and ID; used to identify an organization and its associated ID
- XPN = Person Name; the data type communicates patients and persons
- XTN = Telephone number; used to communicate the contact details of a person, patient or organization

Description: The HL7 element name

Notes/Requirement: Descriptions, comments, and explanatory notes useful in guiding implementation of the HL7 2.5.1 messages. It also includes value set table names, which are attributed only to the data type attribute tables and the segment attribute tables. If the field is required for reporting, the row will be highlighted and the reporting requirement number will be indicated here.

Report Requirement indicated in the Notes/Requirement	Description of Requirements associated with the Color
Reporting requirement: 1	Blood lead and general communicable disease required
Reporting requirement: 2	Blood lead only required
Reporting requirement: 3	General communicable disease only required

Example: Sample data in a pipe-delimited HL7 2.5.1 format.

File Header: FHS

The File Header segment is used as the lead-in to a file.

FHS Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	ST [1]	File Field Separator	Hard Code; character to be used as the field separator for the rest of the message.	|
2	R	ST[4..5]	File Encoding Characters	Hard Code	^~\&#
3	R	HD	File Sending Application	The sending application is your LIMS. This is used to identify the creator and the sender of the file that originated from the facility. Will occur only once within the file.	MNYourFacility^2.16.840.1.114222.4.3.3.6.1.1^ISO
3.1	RE	IS	Namespace ID	Sending application name	MNYourFacility
3.2	R	ST [1..199]	Universal ID	Sending application OID ID	2.16.840.1.114222.4.3.3.6.1.1
3.3	R	ID	Universal ID Type	The assigning organization Value Set: HL70301 ISO = An International Standards Organization Object Identifier	ISO
4	R	HD	File Sending Facility	Facility associated with the application that sends the message.	Lab Sending Message Name^24D0000000^CLIA
4.1	R	IS	Namespace ID	Facility that is sending the file. Can hard code.	Lab Sending Message Name
4.2	R	ST [1..199]	Universal ID	Sending Facility CLIA	24D0000000
4.3	R	ID	Literal	Value Set: HL70301 CLIA = Clinical Laboratory Improvement Amendments	CLIA
5	R	HD	File Receiving Application	Receiving application is the Minnesota's Electronic Disease Surveillance System. Can hard code.	MEDSS-ELR^2.16.840.1.114222.4.3.3.6.2.1^ISO
6	R	HD	File Receiving Facility	Receiving facility is the Minnesota Department of Health. Can hard code.	MN DOH^2.16.840.1.114222.4.1.3661^ISO
7	R	TS	File Creation Date/Time	Date and time the file was created by the sending system. Field should be formatted as: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ. Time zone offset is required.	20171228132554-0600

Batch Header: BHS

This segment leads into the file.

BHS Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	ST [1]	Batch Field Separator	Hard Code; character to be used as the field separator for the rest of the message.	|
2	R	ST [4..5]	Batch Encoding Characters	Hard Code	^~\&#
3	R	HD	Batch Sending Application	The sending application is your LIMS. This is used to identify the creator and the sender of the file that originated from the facility. Will occur only once within the file.	MNYourFacility ^2.16.840.1.114222.4.3.3.6.1.1^ISO
3.1	RE	IS	Namespace ID	Sending application name	MNYourFacility
3.2	R	ST [1..199]	Universal ID	Sending application OID ID	2.16.840.1.114222.4.3.3.6.1.1
3.3	R	ID	Universal ID Type	The assigning organization Value Set: HL70301 ISO = An International Standards Organization Object Identifier	ISO
4	R	HD	Batch Sending Facility	Facility associated with the application that sends the message. This can be the same as the FHS.	Lab Sending Message Name^24D0000000^CLIA
4.1	R	IS	Namespace ID	Facility that is sending the file. Can hard code.	Lab Sending Message Name
4.2	R	ST [1..199]	Universal ID	Sending Facility CLIA	24D0000000
4.3	R	ID	Literal	Value Set: HL70301 CLIA = Clinical Laboratory Improvement Amendments	CLIA
5	R	HD	File Receiving Application	Receiving application is the Minnesota's Electronic Disease Surveillance System. Can hard code.	MEDSS-ELR^2.16.840.1.114222.4.3.3.6.2.1^ISO
6	R	HD	File Receiving Facility	Receiving facility is the Minnesota Department of Health. Can hard code.	MN DOH^2.16.840.1.114222.4.1.3661^ISO
7	R	TS	File Creation Date/Time	Date and time the file was created by the sending system. Field should be formatted as: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ. Time zone offset is required.	20171228132554-0600

Message Header: MSH

The MSH segment contains information describing how to parse and process the message. This includes identification of message delimiters, senders, receiver, message type, timestamp, etc.

MSH Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	ST [1]	Field Separator	Hard Code	|
2	R	ST[4..5]	Encoding Characters	Hard Code	^~\&#
3	R	HD	Sending Application	The sending application is your LIMS.	MNYourFacility^2.16.840.1.114222.4.3.3.6.1.1^ISO
3.1	R	IS	Namespace ID	Sending application name	MNYourFacility
3.2	R	ST [1..199]	Universal ID	Sending application OID ID	2.16.840.1.114222.4.3.3.6.1.1
3.3	R	ID	Universal ID Type	The assigning organization Value Set: HL70301 ISO = An International Standards Organization Object Identifier	ISO
4	R	HD	Sending Facility	Facility associated with the application that sends the message. Minnesota would prefer to see complete laboratory name. Reporting requirement: 1	Lab Sending Message Name^24D0000000^CLIA
4.1	R	IS	Sending Facility Name	Reporting requirement: 1	Lab Sending Message Name
4.2	R	ST [1..199]	Universal ID	Sending Facility CLIA Reporting requirement: 1	24D0000000
4.3	R	ID	Literal	Value Set: HL70301 CLIA = Clinical Laboratory Improvement Amendments Reporting requirement: 1	CLIA
5	R	HD	Receiving Application	Receiving application is the Minnesota's Electronic Disease Surveillance System. Can hard code. Add "Test" to the MSH.5.1 when sending test messages.	MEDSS-ELR^2.16.840.1.114222.4.3.3.6.2.1^ISO
6	R	HD	Receiving Facility	Receiving facility is the Minnesota Department of Health. Can hard code.	MN DOH^2.16.840.1.114222.4.1.3661^ISO

MSH Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
7	R	TS	Date/Time of Message	Date and time message was created by the sending system. Field should be formatted as: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ. Time zone offset is required.	20171228132554-0600
9	R	MSG	Message Type	The type of HL7 message that is sent. Can hard code.	ORU^R01^ORU_R01
10	R	ST [1..199]	Message Control ID	String that uniquely identifies the message instance from the sending application.	20171228132554.23456
11	R	PT	Processing ID	Used to indicate the intent for processing the message. Use 'T' when sending test messages. Value Set: HL70103 P= Production	P
12	R	VID	HL7 Version	HL7 version number used to interpret format and content of the message. Can hard code.	2.5.1
15	C(R/RE)	ID	Accept Acknowledgment Type	Since not expecting an acknowledgement, can hard code to NE for "Never"	NE
16	C(R/RE)	ID	Application Acknowledgement Type	Since not expecting an acknowledgement, can hard code to NE for "Never"	NE
21	R	EI	Message Profile Identifier	Information about the ELR message profile. Can hard code. Lab Sender = 2.16.840.1.113883.9.10 ELR Receiver= 2.16.840.1.113883.9.11	PHLabReport-Batch^PHIN^2.16.840.1.113883.9.11^ISO

Software Segment: SFT

The SFT contains information about the sending application(s) used to create the message.

SFT Seq	Usage/ Repeat	Data Type	Description	Notes/Requirement	Example
1	R	XON	Software Vendor Organization	Can hard code.	Known Lab Info System, INC^L^^^^KL&2.16.840.1.113883.19.4.6&ISO^XX^^^123456
1.1	C(R/RE)	ST [1..50]	Organization Name	Interface Engine Vendor	Known Lab Info System, INC
1.2	RE	IS	Organization Name Type Code	Value set: HL70204 L = Legal Name	L

SFT Seq	Usage/ Repeat	Data Type	Description	Notes/Requirement	Example
1.6	C(R/X)	HD	Assigning Authority	The ISO is your assigned organization OID string.	KL&2.16.840.1.113883.19.4.6&ISO
1.7	C(R/X)	ID	Identifier Type Code	Can hard code. Value set: HL70203 XX = Organization identifier	XX
1.10	RE	ST [1..20]	Organization Identifier		123456
2	R	ST [1..15]	Software Certified Version or Release Number	Can hard code	7.1.0
3	R	ST [1..20]	Software Product Name	Can hard code	Known Laboratory
4	R	ST [1..20]	Software Binary ID	A Binary ID is a 20 digit code supplied by the vendor for each release of software. Can be hard coded.	7.1.0032 Patch 6
6	RE	TS	Software Install Date	The date your software was installed	20140201

Patient Information Segment: PID

The PID segment is used to provide basic demographics regarding the subject of the testing.

PID Seq	Usage/ Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID- PID	Can hard code.	1
3	R*	CX	Patient Identifier List	This field is repeatable. Can be used for many different patient/person identifiers. If sending multiple identifiers, the medical record number should be the first iteration. **Social Security Number is NOT allowed and must be filtered out.** Reporting requirement: 1	987654321^^^Facility Name&2.16.840.1.114222.4.10.3&ISO^PI
3.1	R	ST [1..15]	Patient ID number	The ID number with the assigning authority component must uniquely identify the associated patient. Reporting requirement: 1	987654321
3.4	R	HD	Assigning Authority	Identifies the system, application, organization, etc. that assigned the ID number in PID.3.1. This will include the OID. Reporting requirement: 1	Facility Name&2.16.840.1.114222.4.10.3&ISO

PID Seq	Usage/ Repeat	Data Type	Description	Notes/Requirement	Example
3.5	R	ID	Identifier Type Code	Value Set: HL70203 PI = Patient internal identifier Reporting requirement: 1	PI
3.6	RE	IS	Assigning Facility	Identifies the place or location that the ID number was assigned for use.	
5	R*	XPN	Patient Name	Patient name or alias. This field is repeatable. Reporting requirement: 1	Patient^Adam^A^^^^L
5.1	R	ST [1..50]	Family Name	Last Name Reporting requirement: 1	Patient
5.2	RE	ST [1..30]	Given Name	First Name Reporting requirement: 1	Adam
5.3	RE	ST [1..30]	Second and further given names or Initials Thereof	Middle initial/name	A
5.7	RE	ID	Name Type Code	Type of name being sent Value set: HL70200 L = Legal name	L
6	RE	XPN	Mother's Maiden Name	Necessary in newborn identification.	Maiden^Martha^M^^^^M
6.1	RE	ST [1..50]	Family Name	Last name of the mother	Maiden
6.2	RE	ST [1..30]	Given Name	First name of the mother	Martha
6.3	RE	ST [1..30]	Second and further given names or Initials Thereof	Middle initial/name of mother	M
6.7	RE	ID	Name type Code	Type of name being sent – this is constrained to the value M Value set: HL70200 M = Maiden Name	M
7	RE	TS	Date/Time of Birth	Patient's date of birth. Format is YYYYMMDD Reporting requirement: 1	19640619

PID Seq	Usage/ Repeat	Data Type	Description	Notes/Requirement	Example
8	RE	IS	Administrative Sex	Patient's gender. Value Set: HL70001 M= Male Reporting requirement: 1	M
10	RE*	CWE	Race	Core Data Element. Must utilized the value set. This is a repeatable field. Value Set: PHVS_RaceCatecory_CDC Reporting requirement: 1	2106-3^White^CDCREC
10.1	RE	ST [1..20]	Identifier	Reporting requirement: 1	2106-3
10.2	C(RE/X)	ST [1..199]	Text	Text associated with the identifier code Reporting requirement: 1	White
10.3	C(R/X)	ID	Name of Coding System	Race coding system Reporting requirement: 1	CDCREC
11	RE	XAD	Patient Address	Special address designations like apartment or building should be separated out from the main address and placed in the second address location. Reporting requirement: 1	2222 Home Street^ Apt 2^Saint Paul^MN^55125 ^USA^H^^27123
11.1	RE	ST [1..120]	Street Address	Reporting requirement: 1	2222 Home Street
11.2	RE	ST [1..120]	Other Designation	Suite, Apt, etc. Reporting requirement: 1	Apt. 2
11.3	RE	ST [1..50]	City	City abbreviations should not be used (ex: Minneapolis should not be abbreviated to MPLS) Reporting requirement: 1	Saint Paul
11.4	RE	ST [1..50]	State	Two character code Reporting requirement: 1	MN
11.5	RE	ST [1..12]	Zip or Postal Code	US Zip Codes, Zip+4, and Canadian postal codes are supported. Zip code Lookup (http://www.zip-codes.com/search.asp) Reporting requirement: 1	55125
11.9	RE	IS	County/Parish Code	The five digit FIPS code associated with the County of the patient's address. Value Set: PHVS_COUNTY_FIPS_6-4 27123 = Ramsey County, MN	27123

PID Seq	Usage/ Repeat	Data Type	Description	Notes/Requirement	Example
13	RE*	XTN	Phone Number – Home	This field is repeatable. Patient email address and phone number can be both sent. See example to demonstrate how to submit both. Reporting requirement: 1	^PRN^PH^^1^555^5555555 ^NET^Internet^test123@fakemail.com
13.2	RE	ID	Telecommunication on Use Code	Value Set: HL70201 PRN = Primary Residence Number NET = Network (email) address	PRN NET
13.3	RE	ID	Telecommunication on Equipment Type	Value Set: HL70202 PH = Phone Internet = Internet Address	PH Internet
13.4	C(R/X)	ST [1..199]	Email Address	If PID.13.3 indicates NET and PID.13.4 indicated Internet, then enter email address here.	test123@fakemail.com
13.5	C(R/X)	NM	Country Code		1
13.6	C(R/X)	NM	Area/city code	Reporting requirement: 1	555
13.7	C(R/X)	NM	Local Number	Reporting requirement: 1	5555555
14	RE*	XTN	Phone Number – Business	This field is repeatable.	^WPN^PH^^1^555^5555555
14.2	RE	ID	Telecommunication on Use Code	Value Set: HL70201 WPN = Workplace Number	WPN
14.3	RE	ID	Telecommunication on Equipment Type	Value Set: HL70202 PH=Phone	PH
14.6	C(R/X)	NM	Area/city code		555
14.7	C(R/X)	NM	Local Number		5555551
15	RE*	CWE	Primary Language	The primary language for communication with the patient. This field is repeatable.	eng^English^ISO6392
15.1	RE	ST [1..20]	Identifier	Value Set: PHVS_LANGUAGE_ISO639-2_Alpha3 Eng = English	eng
15.2	C(RE/X)	ST [1..199]	Text	Text associated with the identifier code	English
15.3	C(R/X)	ID	Name of Coding System	Value Set: HL70396 ISO6392 = International Standards Organization (ISO) 639 Language	ISO6392

PID Seq	Usage/ Repeat	Data Type	Description	Notes/Requirement	Example
22	RE	CWE	Ethnic Group	Value Set: HL70189 N = Not Hispanics or Latino Reporting requirement: 1	N^Not Hispanic or Latino^HL70189
22.1	RE	ST [1..20]	Identifier – Ethnicity Code	Reporting requirement: 1	N
22.2	C(R/X)	ST [1..199]	Test – Ethnicity Name	Reporting requirement: 1	Not Hispanic or Latino
22.3	C(R/X)	ID	Name of Coding system	Reporting requirement: 1	HL70189
24	O	ID	Multiple Birth Indicator	Use 'Y' to indicate the patient was born in a multiple birth. Value Set = HL70136 Y = Yes	Y
25	O	NM	Birth Order	If PID.24 has a Y value, then use '1' for the first birth, '2' for the second, etc.	2
29	RE	TS	Patient Death Date and Time	Format is: YYYY[MM[DD]]. Minnesota only needs the date of death. Reporting requirement: 1	20171227
30	RE	ID	Patient Death Indicator	If PID.29 is populated, then this field must be set to "Y" Value Set: HL70136 Y = Yes Reporting requirement: 1	Y
33	O	TS	Last Update Date/Time	Last time the patient demographic information was updated. Format: YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]	20121028093000
34	O	HD	Last Update Facility	The PHIN namespace ID and OID of your laboratory	General Hospital Lab^24D0688128^CLIA
34.1	O	IS	Namespace ID	The PHIN namespace ID of your Lab	General Hospital Lab
34.2	O	ST [1..199]	Universal ID	The universal ID (CLIA or OID) of your laboratory	24D0688128
34.3	O	ID	Universal ID Type	Who assigned the ID Value Set: HL70301 CLIA = Clinical Laboratory Improvement Amendments	CLIA

Next of Kin Segment: NK1

The NK1 segment is used to document information about a party associated with the patient such as next of kin, employer, guardian, etc.

NK1 Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID- NK1	The sequence number of each NK1 segment. There can be more than one NK1 segment. NK1 Set ID will be begin with '1'. If there is a subsequent NK1 section, the sequence number shall be '2'.	1
2	RE*	XPN	Name	Next of Kin name; for minors, this is the parent or guardian. Reporting requirement: 1	Maiden^Martha^M
2.1	RE	ST [1..50]	Family Name	Next of Kin last name Reporting requirement: 1	Maiden
2.2	RE	ST [1..30]	Given Name	Next of Kin first name Reporting requirement: 1	Martha
2.3	RE	ST [1..30]	Second and Further Given Names or initials There of	Next of Kin Middle initial/name	M
2.7	RE	ID	Name Type Code	Value set: HL70200 L= Legal	L
3	RE	CWE	Relationship	Relationship to patient. Value set: HL70063 MTH = Mother Reporting requirement: 1	MTH^Mother^HL70063
3.1	RE	ST [1..20]	Identifier	Reporting requirement: 1	MTH
3.2	C(RE/X)	ST [1..199]	Text	Reporting requirement: 1	Mother
3.3	C(R/X)	ID	Name of Coding system	Reporting requirement: 1	HL70063
4	RE	XAD	Next of Kin Address	Special address designations like apartment or building should be separated out from the main address and placed in the second address location.	2222 Home Street^ Apt 2^Saint Paul^MN^55125 ^USA^H^^27123
4.1	RE	ST [1..120]	Street Address		2222 Home Street

NK1 Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
4.2	RE	ST [1..120]	Other Designation	Suite, Apt, etc.	Apt. 2
4.3	RE	ST [1..50]	City	City abbreviations should not be used (ex: Minneapolis should not be abbreviated to MPLS)	Saint Paul
4.4	RE	ST [1..50]	State	Two-character code	MN
4.5	RE	ST [1..12]	Zip or Postal Code	US Zip Codes, Zip+4, and Canadian postal codes are supported. Zip code search (http://www.zip-codes.com/search.asp)	55125
4.9	RE	IS	County/Parish Code	The five-digit FIPS code associated with the County of the next of kin's address. Value Set: PHVS_COUNTY_FIPS_6-4 27123 = Ramsey County, MN	27123
5	RE*	XTN	Phone Number	Next of Kin phone number. This field is repeatable. Next of Kin email address and phone number can both be sent.	^PRN^PH^^1^651^5555555 ^NET^Internet^mother_test123@fakemail.com
5.2	RE	ID	Telecommunication Use Code	Value Set: HL70201 PRN= Primary Residence Number NET = Network (email) address	PRN NET
5.3	RE	ID	Telecommunication Equipment Type	Value Set: HL70202 PH = Phone Internet = Internet Address	PH Internet
5.4	C(R/X)	ST [1..199]	Email Address	If NK1.5.2 indicates NET and NK1.5.3 indicates Internet, then NK1.5.4 will be populated with email address.	mother_test123@fakemail.com
5.5	C(RE/X)	NM	Country Code		1
5.6	C(RE/X)	NM	Area/City Code		651
5.7	C(R/X)	NM	Local Number		5555555
13	C(R/X)	XON	Organization Name	If next of kin or associated party is an organization, use this field. Can be used for employer or organization responsible for the patient. Utilize the NK1.3 to indicate the relationship of the organization to the patient. Reporting requirement: 2	General Assisted Living^D

NK1 Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
13.1	C(R/RE)	ST [1..50]	Organization Name	Name of the organization Reporting requirement: 2	General Assisted Living
13.2	RE	IS	Organization Type Code	Value Set: HL70204 D = Display Name	D
13.6	C(R/X)	HD	Assigning Authority	Identifies the system, application, organization, etc. that assigned the ID in NK1.13.10. If NK1.13.10 is populated, then NK1.13.6 must be populated	
13.7	C(R/X)	ID	Identifier Type Code	Required to send if NK1.13.10 is populated. Value Set: HL70203 XX = Organization identifier	
13.10	RE	ST [1..20]	Organization Identifier	The code for the organization that assigned the Organization Name in NK1.13.1 Reporting requirement: 2	
30	C(R/X)	XPN	Contact Person's Name	The contact person for the organization in NK1.13. This field may be empty if contact person is not known. Reporting requirement: 2	Nurse^Nancy^^^^^^L
30.1	R	ST [1..50]	Surname	The contact person's last name. If contact person is not known, default to "Unavailable" Reporting requirement: 2	Nurse
30.2	RE	ST [1..30]	Given Name	The contact person's first name. Reporting requirement: 2	Nancy
30.7	RE	ID	Name Type code	Value set: HL70200 L= Legal Reporting requirement: 2	L
31	RE*	XTN	Contact Person's Telephone Number	This field is repeatable. Reporting requirement: 2	^PRN^PH^^^651^5555552
31.2	RE	ID	Telecommunication Use Code	Value Set: HL70201 PRN= Primary Residence Number	PRN
31.3	RE	ID	Telecommunication Equipment Type	Value Set: HL70202 PH = Phone	PH
31.5	C(RE/X)	NM	Country Code		1
31.6	C(RE/X)	NM	Area/City Code	Reporting requirement: 2	651

NK1 Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
31.7	C(R/X)	NM	Local Number	Reporting requirement: 2	5555552

Patient Visit information: PV1

The PV1 segment is used to communication basic inpatient or outpatient encounter information.

PV1 Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID – PV1		1
2	R	IS	Patient Class	Classification of the patient's visit. If patient class is inpatient (I), then PV1.3 and PV1.4 are required. Value Set: HL70004 O = Outpatient	O
3	C(RE/X)	PL	Assigned Patient Location	If PV1.2 is populated with 'I' (Inpatient), then PV1.3 must be populated. Else PV1.3 is not populated.	
4	C(RE/X)	IS	Admission Type	If PV1.2 is populated with 'I' (Inpatient), then PV1.4 must be populated. Else PV1.4 is not populated. Value Set: PHVS_AdmissionType_hl7_2x or HL70007 R = Routine	R
14	O	IS	Admit Source	Value Set: HL70023 5 = Transfer from a skilled nursing facility	5
36	RE	IS	Discharge Disposition	Value Set: HL70112 01 = Discharge to home care or self care (routine discharge)	01
44	RE	TS	Admit Date/Time	Date and time patient arrived for service Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ.	
45	RE	TS	Discharge Date/Time	Date and time patient services ended Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ.	

Common Order Segment: ORC

The ORC segment is used for basic information about the order for testing the specimen. The segment includes identifiers of the order, who placed the order, when it was placed, what action to take regarding the order, etc.

ORC Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	ID	Order Control	Can hard code.	RE
2	CE	EI	Placer Order Number	Submitter's order number information for the test. This is the same as OBR.2	23456^Lab_EHR^2.1.16.999.1.111111.1.1^ISO
2.1	R	ST [1..199]	Entity Identifier	Submitter's order number string	23456
2.2	RE	IS	Namespace ID	The namespace ID for the submitter of the order number	Lab_EHR
2.3	R	ST [1..199]	Universal ID	The namespace OID for the submitter's order number	2.1.16.999.1.111111.1.1
2.4	R	ID	Universal ID Type	The assigning organization Value Set: HL70301 ISO = An International Standards Organization Object Identifier	ISO
3	R	EI	Filler Order Number	The order number in the LIMS system. This is the same as OBR.3	2222MINNESOTA^MINNESOTA_OPENELIS^2.1.16.1.444444.1.1^ISO
3.1	R	ST [1..199]	Entity Identifier	The order number in the LIMS system. This is a system generated number from the LIMS.	2222MINNESOTA
3.2	RE	IS	Namespace ID	The namespace ID of the LIMS system.	MINNESOTA_OPENELIS
3.3	R	ST [1..199]	Universal ID	The OID of the LIMS system	2.1.16.1.444444.1.1
3.4	R	ID	Universal ID Type	The assigning organization Value Set: HL70301 ISO = An International Standards Organization Object Identifier	ISO
12	C(R/RE)	XCN	Ordering Provider	Provider who ordered the tests. Same as OBR.16 Reporting requirement: 1	1234567890^Provider^Joe^C^^DR^^^NPI&2.16. 888.1.333333.0.0&ISO^L^^^NPI^^^^^^^^MD
12.1	RE	ST [1..15]	ID Number	The Provider ID, limited to 15 characters.	1234567890
12.2	R	ST [1..50]	Family Name	Ordering provider's last name. Reporting requirement: 1	Provider
12.3	RE	ST [1..30]	Given Name	Ordering provider's first name. Reporting requirement: 1	Joe
14	C(R/RE)	XTN	Call Back Phone Number	Ordering provider's contact phone number. Same as OBR.17 Reporting requirement: 3	^WPN^PH^^1^651^5555554

ORC Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
14.2	RE	ID	Telecommunication Use Code	Value Set: HL70201 WPN = Workplace number	WPN
14.3	RE	ID	Telecommunication Equipment Type	Value Set: HL70202 PH = Phone	PH
14.5	C(RE/X)	NM	Country Code		1
14.6	C(RE/X)	NM	Area/City Code	Reporting requirement: 3	651
14.7	C(R/X)	NM	Local Number	Reporting requirement: 3	5555554
21	R	XON	Ordering Facility Name	Name of the facility placing the order. Reporting requirement: 1	General Hospital Lab^D^^^^NPI&2.16.888.1.333333.4.6&ISO^XX^^^24D0688128
21.1	R	ST [1..50]	Organization Name	Name of the organization placing the order. Reporting requirement: 1	General Hospital Lab
21.2	RE	IS	Organization Type Code	Value Set: HL70204 D = Display Name	D
21.6	C(R/X)	HD	Assigning Authority	Identifies the system, application, organization, etc. that assigned the ID in ORC.21.10. If ORC.21.10 is populated, then ORC.21.6 must be populated	NPI&2.16.888.1.333333.4.6&ISO
21.7	C(R/X)	ID	Identifier Type Code	Required to send if ORC.21.10 is populated. Value Set: HL70203 XX = Organization identifier	XX
21.10	RE	ST [1..20]	Organization Identifier	The Order Facility ID assigned to the order. Minnesota expects a CLIA number here. Reporting requirement: 3	24D0688128
22	R	XAD	Ordering Facility Address	The address of the facility that placed the order. Special address designations like suite or building should be separated out from the main address and placed in the other designation location. Reporting requirement: 1	22 Order Street^Suite 22^Saint Paul^MN^55125^USA^M^^27123
22.1	R	SAD	Street Name	Street name of ordering facility Reporting requirement: 1	22 Order Street
22.2	RE	ST [1..120]	Other designation	Suite, building number Reporting requirement: 1	Suite 22
22.3	R	ST [1..50]	City	City. City abbreviations should not be used. Reporting requirement: 1	Saint Paul

ORC Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
22.4	R	ST [1..50]	State or Province	Use the FIPS 5-2 two character code associated with the state. Reporting requirement: 1	MN
22.5	R	ST [1..12]	Zip or Postal Code	US Zip Codes, Zip+4, and Canadian postal codes are supported. Zip code Lookup (http://www.zip-codes.com/search.asp) Reporting requirement: 1	55125
22.9	RE	IS	County/Parish Code	Value Set: PHVS_COUNTY_FIPS_6-4 27123 = Ramsey County, MN	27123
23	R	XTN	Ordering Facility Phone Number	The ordering facility phone number. Can be different than call back number (ORC.14) Reporting requirement: 1	^WPN^PH^^1^651^5555551
23.2	RE	ID	Telecommunication Use Code	Value Set: HL70201 WPN = Workplace number	WPN
23.3	RE	ID	Telecommunication Equipment Type	Value Set: HL70202 PH = Phone	PH
23.5	C(RE/X)	NM	Country Code		1
23.6	C(RE/X)	NM	Area/City Code	Reporting requirement: 1	651
23.7	C(R/X)	NM	Local Number	Reporting requirement: 1	5555551
24	R	XAD	Ordering Provider Address	The address of the ordering provider. Special address designations like suite or building should be separated out from the main address and placed in the other designation location. Reporting requirement: 1	11 Provider Address^Suite 2100^Saint Paul^MN^55125^ USA^M^^27123
24.1	R	SAD	Street Name	Street name of ordering provider. Reporting requirement: 1	11 Provider Address
24.2	RE	ST [1..120]	Other designation	Suite, building number Reporting requirement: 1	Suite 2100
24.3	R	ST [1..50]	City	Ordering provider city. City abbreviations should not be used. Reporting requirement: 1	Saint Paul
24.4	R	ST [1..50]	State or Province	Use the FIPS 5-2 two character code associated with the state. Reporting requirement: 1	MN

ORC Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
24.5	R	ST [1..12]	Zip or Postal Code	US Zip Codes, Zip+4, and Canadian postal codes are supported. Zip code Lookup (http://www.zip-codes.com/search.asp) Reporting requirement: 1	55125
24.9	RE	IS	County/Parish Code	Value Set: PHVS_COUNTY_FIPS_6-4 27123 = Ramsey County, MN	27123

Observation Request Segment: OBR

The OBR segment is used to identify the type of test being performed on a specimen and links the information to the testing order.

OBR Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID	The sequence number of each OBR segment. OBR set ID will be a number. There can be more than one OBR segment	1
2	RE	EI	Placer Order Number	The submitter's order information for the test. Field will match ORC.2.	23456^Lab_EHR^2.1.16.999.1.111111.1.1^ISO
2.1	R	ST [1..199]	Entity Identifier	The submitter's order number string	23456
2.2	RE	IS	Namespace ID	The name of the system that assigned the ID for the submitter's order	Lab_EHR
2.3	R	ST [1..199]	Universal ID	The namespace OID for the submitter's order number. This should be the assigning system or organization OID string.	2.1.16.999.1.111111.1.1
2.4	R	ID	Universal ID Type	The assigning organization Value Set: HL70301 ISO = An International Standards Organization Object Identifier	ISO
3	R	EI	Filler Order Number	The filler order number and PHIN namespace information. Field will match ORC.3	2222MINNESOTA^MNYourFacility^2.1.16.1.444444.1.1^ISO
3.1	R	ST [1..199]	Entity Identifier	The order number in the LIMS. This is generated from the LIMS system.	2222MINESOTA
3.2	RE	IS	Namespace ID	The namespace ID of the LIMS	MNYourFacility
3.3	R	ID	Universal ID	The namespace OID for the LIMS.	2.1.16.1.444444.1.1

OBR Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
3.4	R	ID	Universal ID Type	The assigning organization Value Set: HL70301 ISO = An International Standards Organization Object Identifier	ISO
4	R	CWE	Universal Service Identifier	The LOINC Code and LOINC long Name of the ordered test. Assume the LOINC code populates the first triplet and second triplet may be populated with local codes. Value Set: PHVS_LABTESTNAME_NND 18496-0 = Ova and parasites identified in Stool by Trichrome stain – 2nd specimen	18496-0^Ova and parasites identified in Stool by Trichrome stain -- 2nd specimen^LN^OP2^Ova and Parasite Exam 2 All sites, to CL^L
4.1	RE	ST [1..20]	Identifier	Order test code. This is an active LOINC code	18496-0
4.2	C(RE/X)	ST [1..199]	Text	Ordered test name. This will be a the LOINC Long Name description	Ova and parasites identified in Stool by Trichrome stain -- 2nd
4.3	C(R/X)	ID	Name of Coding System	Ordered test code system. Value Set: HL70396 LN = LOINC	LN
7	R	TS	Observation Date/Time	Date and time the specimen was collected. Filed must be the same value as SPM.17 and OBX.14 Reporting requirement: 1	201712200930-0600
13	RE	ST [1..300]	Relevant clinical Information		Diarrhea
16	RE	XCN	Ordering Provider	The provider who ordered the test. Same as ORC.12 Reporting requirement: 1	1234567890^Provider^Joe^C^^DR^^^NPI&2.16.888.1.333333.0.0&ISO^L^^^NPI^^^^^^^^MD
16.1	RE	ST [1..15]	ID Number	The Provider ID, limited to 15 characters.	1234567890
16.2	R	ST [1..50]	Family Name	Ordering provider's last name Reporting requirement: 1	Provider
16.3	RE	ST [1..30]	Given Name	Ordering provider's first name Reporting requirement: 1	Joe
16.9	C(R/X)	HD	Assigning Authority	The organization that assigned the ordering provider's ID. Must be populated if OBR.16.1 is populated	NPI&2.16. 888.1.333333.0.0&ISO

OBR Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
16.13	C(R/X)	ID	Identifier Type Code	Value Set: HL70203 NPI = National Provider Identifier Must be populated if OBR.1 is populated	NPI
17	RE	XTN	Order Callback Phone Number	Submitter's contact phone number. Same information as ORC.14	^WPN^PH^^1^651^5555554
17.2	RE	ID	Telecommunication Use Code	Value Set: HL70201 WPN = Work place number	WPN
17.3	RE	ID	Telecommunication Equipment Type	Value Set: HL70202 PH = Phone	PH
17.5	C(RE/X)	NM	Country Code		1
17.6	C(RE/X)	NM	Area/City Code		651
17.7	C(R/X)	NM	Local Number		5555554
22	R	TS	Results Report/Status Change- Date/Time	Date/Time results were reported or status changed. Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ.	201712211030-0600
25	R	ID	Result Status	Status of the test result or observation Value Set: HL70123 F = Final	F
26	C(R/X)	PRL	Parent Result	This fields is required to be filled out if the ordered test needs to be linked to a "parent" test result. This field allows this result to be linked to a specific OBX segment associated with another OBR segment. See example on Susceptibility resulting.	43304-5&Chlamydia trachomatis rRNA [Presence] in Unspecified specimen by NAA with probe detection&LN^1^positive (qualifier value)
26.1	R	CWE	Parent Observation Identifier	The exact text from the OBX-3 field of the parent result that the child results are connected to. Replace carets with ampersands.	43304-5&Chlamydia trachomatis rRNA [Presence] in Unspecified specimen by NAA with probe detection&LN
26.2	RE	ST [1..20]	Parent Observation Sub-Identifier	The exact text from the OBX-4 of the parent result that the child results are connected to.	1
26.3	RE	TX	Parent Observation Value Descriptor	The exact text from the OBX-5.2 of the parent result that the child results are connected to.	positive (qualifier value)
29	C(R/X)	EIP	Parent	The parent order numbers. This field is also used to link to a parent test result.	23456&Lab_EHR&2.1.16.999.1.111111.1.1&ISO^2222MINNESOTA&MINNESOTA_OPENELIS&2.1.16.1.444444.1.1&ISO
29.1	RE	EI	Placer Assigned Identifier	The exact text from the OBR-2 field of the parent result, if there is one. Replace carets with ampersands	23456&Lab_EHR&2.1.16.999.1.111111.1.1&ISO

OBR Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
29.2	R	EI	Filler Assigned Identifier	The exact text from the OBR-3 of the parent result. Replace carets with ampersands	2222MINNESOTA&MINNESOTA_OPENELIS&2.1.16.1.444444.1.1&ISO
31	RE*	CWE	Reason for Study	An ICD-10 code that is associated with the reason why the specimen is collected. This a repeatable field. ICD-10 lookup: http://apps.who.int/classifications/icd10/browse/2016/en	Z11.0^Special screening examination for intestinal infectious diseases^I10C~R11^Nausea and vomiting^I10C
31.1	RE	ST [1..20]	Identifier	The ICD-10 code	Z11.0
31.2	C(RE/X)	ST [1..199]	Text	The text associated with the ICD-10 code	Special screening examination for intestinal infectious diseases
31.3	C(R/X)	ID	Name of coding system	Use I10C for ICD-10 codes	I10C

Observation/Result Segment: OBX

The OBX segment is used to provide information regarding a single observation (result) that is related to the ordered test (OBR) or specimen (SPM).

CWE – CODED WITH EXCEPTION DATA TYPE: UTILIZE FOR WHEN RESULTS ARE CATEGORICAL OR ORGANISMS ARE FOUND.

OBX - CWE Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID – OBX	The sequence number of each OBX segment. OBX set ID will be a number. There can be more than one OBX segments within a single OBR.	1
2	C(R/X)	ID	Value Type	The HL7 data type of the result in OBX.5. The value type will determine what information can populate the OBX.5 Value Set: HL70125 CWE = Coded with Exceptions	CWE
3	R	CWE	Observation Identifier	The test LOINC code and LOINC Long Name. Populate the first triplet with LOINC and the second triplet with local codes. Reporting requirement: 1	43304-5^Chlamydia trachomatis rRNA [Presence] in Unspecified specimen by NAA with probe detection^LN^CHLA^C. Trachomatis^L^2.34^v unknown

OBX - CWE Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
3.1	RE	ST [1..20]	Identifier	The resulted test or Question code Value Set: PHVS_LabtestName_NND_V1 Reporting requirement: 1	43304-5
3.2	C(RE/X)	ST [1..199]	Text	The resulted test or question text associated with the code. This should be the LOINC Long Name. Reporting requirement: 1	Chlamydia trachomatis rRNA [Presence] in Unspecified specimen by NAA with probe detection
3.3	C(R/X)	ID	Name of Coding System	The Resulted test code system. For the first triplet this sound be LN. Value Set: HL70396 LN = LOINC Reporting requirement: 1	LN
4	C(R/RE)	ST [1..20]	Observation Sub ID	Required if there is more than one OBX within an OBR. The field should be populated with a sequential number. This is used to link with linking organisms to drug susceptibility testing.	1
5	C(R/RE)	CWE	Observation Value	The test result or answer to OBX.3. Results will vary based on the Data type in OBX.2. If it is a CWE or CE data type, the use of a SNOMED code and the SNOMED Fully specified Name is required for Minnesota. Reporting requirement: 1	10828004^positive (qualifier value)^SCT^POS^Positive^L
5.1	RE	ST	Identifier	The result code. Reporting requirement: 1	10828004
5.2	C(RE/X)	ST	Text	The text associated with the result code. Reporting requirement: 1	positive (qualifier value)
5.3	C(R/X)	ID	Name of Coding System	SCT: SNOMED CT Reporting requirement: 1	SCT
8	C(RE/X)	CWE	Abnormal Flag	Value Set: HL70078 A = Abnormal	A^Abnormal^HL70078^^^^2.7
8.1	RE	ST [1..20]	Identifier		A
8.2	C(RE/X)	ST [1..199]	Text	Text associated with the identifier code.	Abnormal
8.3	C(RE/X)	ID	Name of Coding System	The abnormal flag code system.	HL70078

OBX - CWE Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
11	R	ID	Observation Result Status	Observation Result Status Code. Value Set: HL70058 F = Final Reporting requirement: 1	F
14	C(R/RE)	TS	Date/Time of the Observation	Specimen collection date and time. Same as OBR.7 and SPM.17.1 Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ Reporting requirement: 1	201712200930-0600
19	R	TS	Date/Time of the Analysis	Time when the test was performed	201712201005-0600
23	R	XON	Performing Organization Name	The Organization that performed the laboratory testing. Reporting requirement: 1	Minnesota Public Health Laboratory^D^^^^CLIA&2.16.840.1.113883.19.4.7&ISO^XX^^^24D0651409
23.1	C(R/RE)	ST [1..50]	Organization Name	The name of the organization performing the laboratory testing	Minnesota Public Health Laboratory
23.2	RE	SI	Organization Name Type Code	Value Set: HL70204 D = Display Name	D
23.6	C(R/X)	HD	Assigning Authority	Organization that assigned the Lab ID. For CLIA-certified labs, the CMS OID is required.	CLIA&2.16.840.1.113883.19.4.7&ISO
23.7	C(R/X)	ID	Identifier Type Code	Value Set: HL70203 XX = Organization identifier	XX
23.10	RE	ST [1..20]	Organization Identifier	CLIA ID of the performing organization	24D0651409
24	R	XAD	Performing Organization Address	Address of the organization performing the testing. Reporting requirement: 1	625 Robert St^^Saint Paul^MN^55125^USA^B
24.1	R	SAD	Street Address	Organization performing the lab testing street address	625 Robert St
24.2	RE	ST [1..120]	Other Designation	Suite or building number	
24.3	RE	ST [1..50]	City	City of the organization performing the lab testing	Saint Paul
24.4	RE	ST [1..50]	State	State of the organization performing the lab testing. Use FIPS two character code.	MN
24.5	RE	ST [1..12]	Zip or Postal Code	US Zip Codes, Zip+4, and Canadian postal codes are supported. Zip code Lookup (http://www.zip-codes.com/search.asp)	55125

Observation/Result Segment: OBX - SN

The OBX segment is used to provide information regarding a single observation (result) that is related to the ordered test (OBR) or specimen (SPM).

SN – STRUCTURED NUMERIC DATA TYPE: UTILIZE FOR WHEN RESULTS ARE TITERS, RATIOS, INTERVALS OR INEQUALITIES.

OBX- SN Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID – OBX	The sequence number of each OBX segment. OBX set ID will be a number. There can be more than one OBX segments within a single OBR.	1
2	C(R/X)	ID	Value Type	The HL7 data type of the result in OBX.5. The value type will determine what information can populate the OBX.5 Value Set: HL70125 SN = Structured Numeric	SN
3	R	CWE	Observation Identifier	The test LOINC code and LOINC Long Name. Populate the first triplet with LOINC and the second triplet with local codes Reporting requirement: 1	10368-9^Lead [Mass/volume] in Capillary blood^LN PBSER^ Lead, Results^L
3.1	RE	ST [1..20]	Identifier	The resulted test or Question code Value Set: PHVS_LabtestName_NND_V1 Reporting requirement: 1	10368-9
3.2	C(RE/X)	ST [1..199]	Text	The resulted test or question text associated with the code. This should be the LOINC Long Name. Reporting requirement: 1	Lead [Mass/volume] in Capillary blood
3.3	C(R/X)	ID	Name of Coding System	The Resulted test code system. For the first triplet this sound be LN. Value Set: HL70396 LN = LOINC Reporting requirement: 1	LN
4	C(R/RE)	ST [1..20]	Observation Sub ID	Required if there is more than one OBX within an OBR. The field should be populated with a sequential number. This is used to link with linking organisms to drug susceptibility testing.	1
5	C(R/RE)	SN	Observation Value	The result or answer to OBX.3. Result will vary based on Data type in OBX.2. Appropriate structure numeric values include intervals (^0^-^1), ratios (^1^:^2), inequalities(<^10), or categorical results (2^+) Reporting requirement: 1	=^9.2

OBX- SN Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
5.1	RE	ST	Comparator	Symbols that could be used to compare results (< > =) Reporting requirement: 1	=
5.2	C(RE/X)	NM	Number 1	The first number in the ratio or inequality Reporting requirement: 1	9.2
5.3	RE	ST	Separator/suffix	If two numbers are sent, this field separates the numbers. For titers use a colon (:); for intervals, use a dash (-) Reporting requirement: 3	
5.4	RE	NM	Number 2	The second number that is provided in the result. Used in titers or intervals Reporting requirement: 3	
6	C(R/RE)	CWE	Units	Units for the numerical data (NM, SN). If OBX.2 is not a numerical data type, OBX.6 can be blank. Value Set: PHVS_UnitsOfMeasure_CDC Reporting requirement: 1	ug/dL^MicroGramsPerDeciLiter^UCUM
6.1	RE	ST [1..20]	Identifier	The unit's code. Use UCUM standard code here. For units that do not have a unit of measure (ratios, counts), then use "1" Reporting requirement: 1	ug/dL
6.2	C(RE/X)	ST [1..199]	Text	The unit name. Reporting requirement: 1	MicroGramsPerDeciLiter
6.3	C(R/X)	ID	Name of Coding System	The unit's code system. This should be "UCUM" Value Set: HL70396 UCUM= Unified code for units of measure Reporting requirement: 1	UCUM
7	RE	ST [1..60]	Reference Range	The reference range for the result. Need to send if OBX.4 indicates a quantitative result (SN or NM) Reporting requirement: 1	0.0-4.9
8	C(RE/X)	CWE	Abnormal Flag	Value Set: HL70078 H = Above High Normal	H^Above High Normal^HL70078^^^^2.7
8.1	RE	ST [1..20]	Identifier		H
8.2	C(RE/X)	ST [1..199]	Text	Text associated with the identifier code.	Above High Normal
8.3	C(RE/X)	ID	Name of Coding System	The abnormal flag code system.	HL70078

OBX- SN Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
11	R	ID	Observation Result Status	Observation Result Status Code. Value Set: HL70058 F = Final Reporting requirement: 1	F
14	C(R/RE)	TS	Date/Time of the Observation	Specimen collection date and time. Same as OBR.7 and SPM.17. Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ Reporting requirement: 1	201712200930-0600
19	RE	TS	Date/Time of the Analysis	Time when the test was performed	201712201005-0600
23	R	XON	Performing Organization Name	The Organization that performed the laboratory testing. Reporting requirement: 1	Minnesota Public Health Laboratory^D^^^^CLIA&2.16.840.1.113883.19.4.7&ISO^XX^^^24D0651409
23.1	C(R/RE)	ST [1..50]	Organization Name	The name of the organization performing the laboratory testing Reporting requirement: 1	Minnesota Public Health Laboratory
23.2	RE	SI	Organization Name Type Code	Value Set: HL70204 D = Display Name	D
23.6	C(R/X)	HD	Assigning Authority	Organization that assigned the Lab ID. For CLIA-certified labs, the CMS OID is required.	CLIA& 2.16.840.1.113883.19.4.7&ISO
23.7	C(R/X)	ID	Identifier Type Code	Value Set: HL70203 XX = Organization identifier	XX
23.10	RE	ST [1..20]	Organization Identifier	CLIA ID of the performing organization Reporting requirement: 1	24D0651409
24	R	XAD	Performing Organization Address	Address of the organization performing the testing. Reporting requirement: 1	625 Robert St^^Saint Paul^MN^55125^USA^B
24.1	R	SAD	Street Address	Organization performing the lab testing street address Reporting requirement: 1	625 Robert St
24.2	RE	ST [1..120]	Other Designation	Suite or building number Reporting requirement: 1	
24.3	RE	ST [1..50]	City	City of the organization performing the lab testing Reporting requirement: 1	Saint Paul
24.4	RE	ST [1..50]	State	State of the organization performing the lab testing. Use FIPS two character code. Reporting requirement: 1	MN

OBX- SN Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
24.5	RE	ST [1..12]	Zip or Postal Code	US Zip Codes, Zip+4, and Canadian postal codes are supported. Zip code Lookup (http://www.zip-codes.com/search.asp) Reporting requirement: 1	55125

Observation/Result Segment: OBX - NM

The OBX segment is used to provide information regarding a single observation (result) that is related to the ordered test (OBR) or specimen (SPM).

NM – NUMERIC DATA TYPE: UTILIZE FOR WHEN RESULTS ARE NUMERIC VALUES THAT ARE NOT TITERS, RATIOS, INTERVALS OR INEQUALITIES.

OBX-NM Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID – OBX	The sequence number of each OBX segment. OBX set ID will be a number. There can be more than one OBX segments within a single OBR.	1
2	C(R/X)	ID	Value Type	The HL7 data type of the result in OBX.5. The value type will determine what information can populate the OBX.5 Value Set: HL70125 NM = Numeric	NM
3	R	CWE	Observation Identifier	The test LOINC code and LOINC Long Name. Populate the first triplet with LOINC and the second triplet with local codes. Value Set: PHVS_LabtestName_NND_V1 Reporting requirement: 1	10368-9^Lead [Mass/volume] in Capillary blood^LN
3.1	RE	ST [1..20]	Identifier	The resulted test or Question code Reporting requirement: 1	10368-9
3.2	C(RE/X)	ST [1..199]	Text	The resulted test or question text associated with the code. This should be the LOINC Long Name. Reporting requirement: 1	Lead [Mass/volume] in Capillary blood
3.3	C(R/X)	ID	Name of Coding System	The Resulted test code system. For the first triplet this should be LN. Value Set: HL70396 LN = LOINC Reporting requirement: 1	LN

OBX-NM Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
4	C(R/RE)	ST [1..20]	Observation Sub ID	Required if more than one OBX within an OBR. The field should be populated with a sequential number. This is used to link with DST	1
5	C(R/RE)	NM	Observation Value	The result or answer to OBX.3. Result will vary based on Data type in OBX.2. The only non-numeric characters allowed are leading plus (+) or minus (-) sign. Reporting requirement: 1	50
6	C(R/RE)	CWE	Units	Units for the numerical data (NM, SN). If OBX.2 is not a numerical data type, OBX.6 can be blank. Value Set: PHVS_UnitsOfMeasure_CDC_V1 Reporting requirement: 1	ug/dL^MicroGramsPerDeciLiter^UCUM
6.1	RE	ST [1..20]	Identifier	The unit code. Use UCUM standard code here. For units that do not have a unit of measure (ratios, counts), then use “1”	ug/dL
6.2	C(RE/X)	ST [1..199]	Text	The unit name.	MicroGramsPerDeciLiter
6.3	C(R/X)	ID	Name of Coding System	The unit code system. This should be “UCUM” Value Set: HL70396 UCUM = Unified code for unites of measure	UCUM
7	RE	ST [1..60]	Reference Range	The reference range for the result. Need to send if OBX.4 indicates a quantitative result (SN or NM) Reporting requirement: 1	<10 ug/dL
8	C(RE/X)	CWE	Abnormal Flag	Value Set: HL70078 H = Above High Normal	H^Above High Normal^HL70078^^^^2.7
8.1	RE	ST [1..20]	Identifier		H
8.2	C(RE/X)	ST [1..199]	Text	Text associated with the identifier code.	Above High Normal
8.3	C(RE/X)	ID	Name of Coding System	The abnormal flag code system.	HL70078
11	R	ID	Observation Result Status	Observation Result Status Code. Value Set: HL70058 F = Final Reporting requirement: 1	F
14	C(R/RE)	TS	Date/Time of the Observation	Specimen collection date and time. Same as OBR.7 and SPM.17. Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ Reporting requirement: 1	201712200930-0600

OBX-NM Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
19	RE	TS	Date/Time of the Analysis	Time when the test was performed	201712201005-0600
23	R	XON	Performing Organization Name	The organization that performed the laboratory testing. Reporting requirement: 1	Minnesota Public Health Laboratory^D^^^^CLIA&2.16.840.1.113883.19.4.7&ISO^XX^^^24D0651409
23.1	C(R/RE)	ST [1..50]	Organization Name	The name of the organization performing the laboratory testing	Minnesota Public Health Laboratory
23.2	RE	SI	Organization Name Type Code	Value Set: HL70204 D = Display Name	D
23.6	C(R/X)	HD	Assigning Authority	Organization that assigned the Lab ID. For CLIA-certified labs, the CMS OID is required.	CLIA& 2.16.840.1.113883.19.4.7&ISO
23.7	C(R/X)	ID	Identifier Type Code	Value Set: HL70203 XX = Organization identifier	XX
23.10	RE	ST [1..20]	Organization Identifier	CLIA ID of the performing organization	24D0651409
24	R	XAD	Performing Organization Address	Address of the organization performing the testing. Reporting requirement: 1	625 Robert St^^Saint Paul^MN^55125^USA^B
24.1	R	SAD	Street Address	Organization performing the lab testing street address	625 Robert St
24.2	RE	ST [1..120]	Other Designation	Suite or building number	
24.3	RE	ST [1..50]	City	City of the organization performing the lab testing	Saint Paul
24.4	RE	ST [1..50]	State	State of the organization performing the lab testing. Use FIPS two character code.	MN
24.5	RE	ST [1..12]	Zip or Postal Code	US Zip Codes, Zip+4, and Canadian postal codes are supported. Zip code Lookup (http://www.zip-codes.com/search.asp)	55125

Specimen Segment: SPM

The SPM segment is used to provide information regarding the type of specimen, where and how it was collected, who collected it and basic characteristics of the specimen.

SPM Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID – SPM	There can only be one specimen per ELR message. Hardcode to 1	1
2	R	EIP	Specimen ID	Placer and Filler Specimen ID.	23456&Lab_EHR&2.1.16.999.1.111111.1.1&ISO^2222MINNESOTA&MINNESOTA_OPENELIS&2.1.16.1.444444.1.1&ISO
2.1	RE	EI	Placer Assigned Identifier	The submitter's specimen ID information for the test. This is the ordering facility's specimen ID, facility name, OID and assigning organization	23456&Lab_EHR&2.1.16.999.1.111111.1.1&ISO
2.2	R	EI	Filler Assigned Identifier	Your Specimen ID and PHIN namespace Reporting requirement: 1	2222MINNESOTA&MINNESOTA_OPENELIS&2.1.16.1.444444.1.1&ISO
4	R	CWE	Specimen Type	Use SNOMED Code and SNOMED Fully Specified Name. Description of the precise nature of the entity that is the source material for the observation. Value Set: PHVS_Specimen_CDC Reporting requirement: 1	258524009^cervical swab (specimen)^SCT^CX^Cervix^L
4.1	RE	ST [1..20]	Identifier	SNOMED Code for the Specimen Type Reporting requirement: 1	258524009
4.2	C(RE/X)	ST [1..199]	Text	SNOMED Fully Specified Name for Specimen Type Reporting requirement: 1	cervical swab (specimen)
4.3	C(R/X)	ID	Name of Coding System	Value Set: HL70396 SCT = SNOMED CT Reporting requirement: 1	SCT
8	RE	CWE	Specimen Source Site	The body or source site. Source from which the specimen was obtained. For biological samples, it may represent the anatomical site from which the specimen was collected. Use of SNOMED CT codes is required. Value Set: PHVS_BodySite_HITSP Reporting requirement: 1	13648007^Urethral structure (body structure)^SCT
8.1	RE	ST [1..20]	Identifier	SNOMED Code for specimen source site Reporting requirement: 1	13648007
8.2	C(RE/X)	ST [1..199]	Text	SNOMED Fully Specified Name for Specimen Source Reporting requirement: 1	Urethral structure (body structure)

SPM Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
8.3	C(R/X)	ID	Name of Coding System	The coding system used for the code in SPM.8.1 Value Set: HL70396 SCT = SNOMED CT Reporting requirement: 1	SCT
14	O	ST	Specimen Description		
17	R	DR	Specimen Collection Date/Time	Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ Reporting requirement: 1	201712200930-0600
18	R	TS	Specimen Received Date/Time	The date/time the specimen was received by the laboratory. Format: YYYYMMDDHHMMSS[.S[S[S[S]]]]+/-ZZZZ	201712200945-0600

Notes Segment: NTE

The NTE segment is used to provide additional information regarding the associated segment (which ever segment is directly above the NTE). NTE segments can be placed after OBR, OBX, or SPM segments. **It should not be used to relay relevant clinical information and is inappropriate for use to relay results.**

NTE Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	SI	Set ID – NTE	The sequence number of the NTE segment. Initial value is '1' and is incremented for each additional NTE segment added.	1
2	RE	ID	Source Comment	Defines where the comment originated Value Set: HL70105 L = LIMS	L
3	R	FT	Comment	Can contain either plain text or plain text with HL7 formatting codes like \.br\ (Line break). This field can be repeated. HL7 special characters require escape characters to be used instead. For assistance and list of escape characters, refer to the Generating HL7 Messages section.	Comment goes here. It can be very long.

Batch Trailer: BTS

The batch trailer segment defined the end of a batch of messages.

BTS Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	NM	Batch Message Count	The number messages contained in the batch.	1

File Trailer: FTS

The file trailer segment defines the end of a file.

FTS Seq	Usage/Repeat	Data Type	Description	Notes/Requirement	Example
1	R	NM	File Batch Count	The number of batches contained in the file. This will always be '1'	1

Appendix C: Susceptibility Results – Parent/Child Messaging

The use of a parent/child relationship is to link together "child" sensitivity results to "parent" culture results. This means that there can be many child results for a single parent result. This is important in public health surveillance to determine the resistance of organisms to different types of medications. These results are used to monitor for super-bugs that require stronger antibiotics to treat simple infections.

This can be done in the Observation Request (OBR) segment of the message by linking the child OBR's Parent Sequence (located in OBR 29) to the parent Filler Order Number (located in OBR 3). The Child OBR.26 provides information from three components - the parent's Observation Identifier (OBX-3), the parent's Observation Sub ID (OBX-4), and the parent's Observation Value (OBX-5.2) – to point to the parent OBX where the culture result is reported (purple text). Both pieces of information are needed to properly link the susceptibility results to the correct culture results.

Remember to replace the carats (^) with ampersands (&) when populating the child OBR segment.

OBR|1|**T6741^^2.16.840.1.113883.3.72.5.24^ISO**|**T674120140916^SW^2.16.8403.1.113883.3.72.5.25^ISO**|600-7^Bacteria identified in Blood by Culture^LN^BC^Blood Culture^L^2.4.2^v1^Blood Culture|||20140916102600-0600|||^|||||^^^^^^^^SW&&ISO^L^^^DN^SW&&ISO||13||T6741||20140916112826-0600|||F|||||||||||||||||||||||

OBX|1|CWE|**6463-4^Bacteria identified in Unspecified specimen by Culture^LN**^CULT^Culture^L^2.4.2^v1^Culture|1|115329001^**Methicillin resistant Staphylococcus aureus (organism)**^SCT^MRSA^Methicillin resistant Staphylococcus aureus (MRSA)^L^20140131^v1|||A^Abnormal^HL70078^A^Abnormal^HL70078^2.5.1^V1^Abnormal|||F|||20140916102600-0600|||||20140916112826-0600|||^^^^^CLIA&&ISO^XX^^^|^^Minneapolis^MN^55455|^^^A.^^^^^SW&&ISO^L^^^^^^^^^^MD|||^^^^^^^^^|

OBX|2|CWE|**6463-4^Bacteria identified in Unspecified specimen by Culture^LN**^CULT^Culture^L^2.4.2^v1^Culture|2|444466404^**Genus Cronobacter (organism)**^SCT^CROSAK^Cronobacter (Enterbacter)^L^20140131^v1|||A^Abnormal^HL70078^A^Abnormal^HL70078^2.5.1^V1^Abnormal|||F|||20140916102600-0600|||||20140916112826-0600|||^^^^^CLIA&&ISO^XX^^^|420 Delaware St SE^^Minneapolis^MN^55455|^^^A.^^^^^SW&&ISO^L^^^^^^^^^^MD|||^^^^^^^^^|

OBR|2|T6741^^^CLIA|T674120140916-2^SW^^ISO|50545-3^Bacterial susceptibility panel by Minimum inhibitory concentration (MIC) identified in Wound by Culture^LN^WDC^Wound Culture^L^2.4.2^v1^Wound Culture|||20140916102600-0600|||^|G|||||^^^^^^^^SW&&ISO^L^^^DN^SW&&ISO||13||T6741||20140916112826-0600|||F|**6463-4&Bacteria identified in Unspecified specimen by Culture&LN**^1^**Methicillin resistant Staphylococcus aureus**

(organism)|||**T6741&&2.16.840.1.113883.3.72.5.24&ISO**^**T674120140916&SW&2.16.8403.1.113883.3.72.5.25&ISO**||||||||||||||||||||

OBX|1|SN|18908-4^Clindamycin [Susceptibility]^LN^CLIN^Clindamycin^L^2.4.2^v1^Clindamycin|1|>^8.0|ug/mL^^UCUM^ug/mL^^L^1.1^v1||R^Resistant^HL70078^R^Resistant^HL70078^2.5.1^V1^Resistant|||F|||20140916102600-0600|||||20140916112826-0600|||^^^^^CLIA&&ISO^XX^^^|420 Delaware St SE^^Minneapolis^MN^55455|^Killeen^Anthony^A.^^^^^SW&&ISO^L^^^^^^^^^^MD|||^^^^^^^^^|<cr>

OBX|2|CWE|18908-4^Clindamycin [Susceptibility]^LN^CLIN^Clindamycin^L^2.4.2^v1^Clindamycin|2|30714006^Resistant (qualifier value)^SCT^R^Resistant^L^20140131^v1|||||F|||20140916102600-0600|||||20140916112826-0600|||^^^^^CLIA&&ISO^XX^^^|^^Minneapolis^MN^55455|^^^^^^^^SW&&ISO^L^^^^^^^^^^^MD|||^^^^^^^^^|

OBR|3|T6741^^^CLIA|T674120140916-2^SW^^ISO|50545-3^Bacterial susceptibility panel by Minimum inhibitory concentration (MIC) identified in Wound by Culture^LN^WDC^Wound Culture^L^2.4.2^v1^Wound Culture|||20140916102600-0600|||^|G|||||444372^IKRAMUDDIN^SAYEED^^^^^^SW&&ISO^L^^^DN^SW&&ISO||13||T6741||20140916112826-0600|||F|**6463-4&Bacteria identified in Unspecified specimen by Culture&LN**^2^**Genus Cronobacter (organism)**|||**T6741&&2.16.840.1.113883.3.72.5.24&ISO**^**T674120140916&SW&2.16.8403.1.113883.3.72.5.25&ISO** ||||||||||||||||||||

OBX|1|SN|18908-4^Clindamycin [Susceptibility]^LN^CLIN^Clindamycin^L^2.4.2^v1^Clindamycin|1|>^8.0|ug/mL^^UCUM^ug/mL^^L^1.1^v1||R^Resistant^HL70078^R^Resistant^HL70078^2.5.1^V1^Resistant|||F|||20140916102600-0600|||||20140916112826-0600|||^^^^^CLIA&&ISO^XX^^^|420 Delaware St SE^^Minneapolis^MN^55455|^Killeen^Anthony^A.^^^^^SW&&ISO^L^^^^^^^^^^MD|||^^^^^^^^^|<cr>

OBX|2|CWE|18908-4^Clindamycin [Susceptibility]^LN^CLIN^Clindamycin^L^2.4.2^v1^Clindamycin|2|30714006^Resistant (qualifier value)^SCT^R^Resistant^L^20140131^v1|||||F|||20140916102600-0600|||||20140916112826-0600|||^^^^^CLIA&&ISO^XX^^^|^^Minneapolis^MN^55455|^^^A.^^^^^SW&&ISO^L^^^^^^^^^^MD|||^^^^^^^^^|

Appendix D: Sample Test Messages

Sample Message – CWE data type

FHS|^~\&#|MNOpenELIS^2.16.840.1.114222.4.3.3.6.1.1^ISO|Minnesota Lab – Lakeview^2.16.840.1.113883.19.3.2^ISO|MEDSS-ELR^2.16.840.1.114222.4.3.3.6.2.1^ISO|MN DOH^2.16.840.1.114222.4.1.3661^ISO|20110208132554-0600|\r

BHS|^~\&#|MNOpenELIS^2.16.840.1.114222.4.3.3.6.1.1^ISO|Minnesota Lab – Lakeview^2.16.840.1.113883.19.3.2^ISO|MEDSS-ELR^2.16.840.1.114222.4.3.3.6.2.1^ISO|MN DOH^2.16.840.1.114222.4.1.3661^ISO|20110208132554-0600|\r

MSH|^~\&#|MNOpenELIS^2.16.840.1.114222.4.3.3.6.1.1^ISO|Minnesota Lab – Lakeview^2.16.840.1.113883.19.3.2^ISO|MEDSS-ELR^2.16.840.1.114222.4.3.3.6.2.1^ISO|MN DOH^2.16.840.1.114222.4.1.3661^ISO|20110208132554-0600||ORU^R01^ORU_R01|20171228132554.23456|P|2.5.1|||NE|NE|USA||||PHLabReport-Batch^PHIN^2.16.840.1.113883.9.11^ISO\r

SFT|Known Lab Information systems, Inc.^L^^^^KL&2.16.840.1.113883.19.4.6&ISO^XX^^^123456|7.1.0|Known Laboratory|7.1.0032 Patch 6||20141201\r

PID|1||36363636^^^MPI&2.16.840.1.113883.19.3.2.1&ISO^MR^MPI&2.16.840.1.113883.19.3.2.1&ISO~3030303^^^Facility Name&2.16.840.1.114222.4.10.3&ISO^PT^ReferenceLab||Everyman^Adam^A^^^^L|Maiden^Martha^M^^^^M|19640619|M||2106-3^White^CDCREC^^^^04/24/2007~2054-5^Black or African American^CDCREC|2222 Home Street^ Apt 2^Saint Paul^MN^55125^USA^H^^27123||^PRN^PH^^1^555^5555555~^NET^Internet^test123@fakemail.com|^WPN^PH^^1^955^5551009|eng^English^ISO6392^^^^3/29/2007|M^Married^HL70002^^^^2.5.1|||||N^Not Hispanic or Latino^HL70189^^^^2.5.1|||||||N|||200808151000-0700|General Hospital Lab^24D0000000^CLIA\r

NK1|1||EMR^Employer^HL70063|||||||||General Assisted Living^D|||||||||||||||Nurse^Nancy^^^^^L|^PRN^PH^^^651^5555552|\r

PV1|1|I|ENNT^^^|R|||||||||5|||||62718794^^^MPI&2.16.840.1.113883.19.3.2.1&ISO^LR|||||||||||||||01|||||||201704060000|201704070000||||||\r

ORC|RE|23456^Lab_EHR^2.1.16.999.1.111111.1.1^ISO|2222MINNESOTA^MINNESOTA_OPENELIS^2.1.16.1.444444.1.1^ISO|||||||||1234567890^Provider^Joe^C^^DR^^^NPI&2.16.888.1.333333.0.0&ISO^L^^^NPI||^WPN^PH^^1^651^5555554|||||||General Hospital Lab^D^^^^NPI&2.16.888.1.333333.4.6&ISO^XX^^^24D0000000|22 Order Street^Suite 22^Saint Paul^MN^55125^USA^M^^27123|^WPN^PH^^1^651^5555551^^Normal Business hours: 9 am to 5 pm|11 Provider Address^Suite 2100^Saint Paul^MN^55125^USA^M^^27123|\r

OBR|1|23456^Lab_EHR^2.1.16.999.1.111111.1.1^ISO|2222Minnesota^MINNESOTA_OPENELIS^2.1.16.1.444444.1.1^ISO|18496-0^Ova and parasites identified in Stool by Trichrome stain – 2nd specimen^LN^OP2^Ova/Parasite Exam 2 All sites, to CL^L|||201712200945-0600|||||diarrhea||||1234567890^Provider^Joe^C^^Dr^^^NPI&2.16.888.1.333333.0.0&ISO^

L^^^NPI|^WPN^PH^^1^651^5555554|||||201712211030-0600|||F||||||Z11.0^Special screening examination for intestinal infectious diseases^I10C~R11^Nausea and vomiting^I10C|\r

OBX|1|CWE|43227-8^Ova and parasites identified in Stool by Trichrome stain^LN|1|78181009^Giardia lamblia^SCT^GIAR^Giardia intestinalis^L|||A^Abnormal^HL70078^^^^2.7|||F|||201712200945-0600|||||||||Minnesota Public Health Laboratory^D^^^^CLIA&2.16.840.1.11388.3.19.4.7&ISO^XX^^^24D0651409|625 Robert St^^Saint Paul^MN^55125^USA^B|9876543^House^Gregory^F^^Dr^^^NPI&2.16.840.1.113883.4.6&ISO^L^^^NPI^NPI&2.16.840.1.113883.4.6&ISO\r

NTE|1|L|Comment goes here \T\ it can be a very long comment.|RE^Remark^HL70364^^^^2.5.1\r

NTE|2|L|This isolate (or specimen) was referred to your public health laboratory|\r

SPM|1|23456&Lab_EHR&2.1.16.999.1.111111.1.1&ISO^2222MINNESOTA&MINNESOTA_OPENELIS&2.1.16.1.444444.1.1&ISO||119339001^Stool specimen^SCT^FC^Feces^L||||||||||||201712200945-0600|201712200945-0600|||||\r

BTS|1||

FTS|1|

LEAD Sample Message

MSH|^~\&#|MNOpenELIS^2.16.840.1.114222.4.3.3.6.1.1^ISO|Minnesota Lab – Lakeview^2.16.840.1.113883.19.3.2^ISO|MN.MEDSS.PROD^2.16.840.1.114222.4.3.3.6.2.1^ISO|MN DOH^2.16.840.1.114222.4.1.3661^ISO|20180321125927-0600||ORU^R01^ORU_R01|2018030211.39|P|2.5.1|||NE|NE|||||PHLabReport-Batch^PHIN^2.16.840.1.113883.9.11^ISO\r

SFT|Known Lab information System, Inc.^L^^^^KL&2.16.840.1.113883.19.4.6&ISO^XX^^^123456|7.10|Known Laboratory|7.1.0032 Patch 6||20141201\r

PID|1||36363637^^^MPI&2.16.840.1.113883.19.3.2.1&ISO^MR^A&2.16.840.1.113883.19.3.2.1&ISO||Everychild^Jane^A^^^^L||20160223|F|||2222 Home Street^^Ann Arbor^MI^99999^USA^H||^PRN^PH^^^651^5555551|||||||||||||||||||||||337915000^HOMO SAPIENS^SCT^HUMAN^HUMAN^L^4^4\r

NK1|1|GRANDMA^DONA^^^^^L|GRP^Grandparent^HL70063|123 GRANDMA AVE N^^BROOKLYN PARK^MN^55428^USA^^^|^PRN^PH^^^612^5555555~^NET^Internet^test123@fakemail.com|||||||||||||||||||||||||\r

PV1|1|O|WB|||||||||||||||PFONE|||||||||||||||||||201803200000\r

ORC|RE|799964-0^Lab_EHR^2.1.16.999.1.111111.1.1^ISO|I997456^MINNESOTA_OPENELIS^2.1.16.1.444444.1.1^ISO|T38625^SQ^2.16.840.1.113883.3.697^ISO|||||||1234567890^Provider^Joe^C^^DR^^

^NPI&2.16.888.1.333333.0.0&ISO^L^^^NPI||^WPN^PH^^^651^4291980|||||||General Hospital Lab^D^^^^NPI&2.16.888.1.333333.4.6&ISO^XX^^^24D0000000|22 Order Street^Suite 22^Saint Paul^MN^55125^USA^M^^27123|^WPN^PH^^1^651^5555551|11 Provider Address^Suite 2100^Saint Paul^MN^55125^USA^M\r

OBR|1|799964-0^Lab_EHR^2.1.16.999.1.111111.1.1^ISO|I997456^MINNESOTA_OPENELIS^2.1.16.1.444444.1.1^ISO|10368-9^Lead [Mass/volume] in Capillary Blood^LN^LEADG^Lead CL^L|||20180320111500-0600|||||||||1234567890^Provider^Joe^C^^DR^^^NPI&2.16.888.1.333333.0.0&ISO^L^^^NPI|^WPN^PH^^^651^4291980|||||20180321125921-0600|||F||||||Z13.88^Encounter for screening for disorder due to exposure to contaminants^I10|||||||||||||||||\r

OBX|1|SN|10368-9^Lead [Mass/volume] in Capillary Blood^LN^PB^Lead, Blood LEADG^L^^v1^Lead, Blood LEADG|1|<^1.9|ug/dL^microgram per deciliter^UCUM^ug/dL^microgram per deciliter^L^1.1^v1|||||F|||20180320111500-0600|||||20180321125921-0600||||General Hospital Lab^D^^^^NPI&2.16.888.1.333333.4.6&ISO^XX^^^24D0000000|22 Order Street^Suite 22^Saint Paul^MN^55125^USA^M\r

SPM|1|799964-0&Lab_EHR&2.1.16.999.1.111111.1.1&ISO^I997456&MINNESOTA_OPENELIS&2.1.16.1.444444.1.1&ISO||122554006^capillary blood (specimen)^SCT^CAPS^Capillary specimen^L^20140101||||||||||||20180320111500-0600|20180320111600-0600\r

Appendix E: Onboarding Preparation Checklist

	Use this checklist to make sure you have completed the steps to prepare for ELR data exchange.
☐	Register your intent to work on an ELR interface with MDH at MDH Interoperability and Public Health Reporting (https://www.health.state.mn.us/data/interoperability/index.html).
☐	Review the Minnesota ELR HL7 2.5.1 Implementation Guide.
☐	Review the MN statutes governing reportable diseases to MDH at Communicable Disease Reporting Rule (http://www.health.state.mn.us/divs/idepc/dtopics/reportable/rule/index.html).
☐	Review the MN statute governing Blood Lead Reporting requirements at Blood Lead (https://www.revisor.mn.gov/statutes/?id=144.9502).
☐	Review HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1 at HL7 V2.5.1 (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=98).
☐	If you will be sending on behalf of more than one facility, fill out the "Facilities Participating in the ELR Onboarding Process with MDH worksheet" to ensure that we are aware of all facilities that will be sending data through your interface.
☐	Complete and submit to MDH the "PIP LabCode List Template" by filling out the LOINC and SNOMED-CT code pairs for MN reportable diseases. It is helpful to note which labs are done in-house versus at a reference facility. Also complete the specimen type/source list.
☐	Complete NIST Test Message Preparation and Validation for ELR using the NIST website (https://hl7v2-elr-testing.nist.gov/mu-elr/).