Arizona Electronic Laboratory Reporting (AZ ELR) Implementation Guide

Version 1.0 | May 2013

HL7 2.5.1 ORU Messaging Specifications

Health and Wellness for all Arizonans

DOCUMENT HISTORY

Thanks to the colleagues of the Electronic Disease Surveillance Program for their invaluable input, ideas, feedback and ongoing support.

AZ ELR Implementation Guide – Document History				
Author	**Date**	**Version**	**Source Document**	**Update Description**
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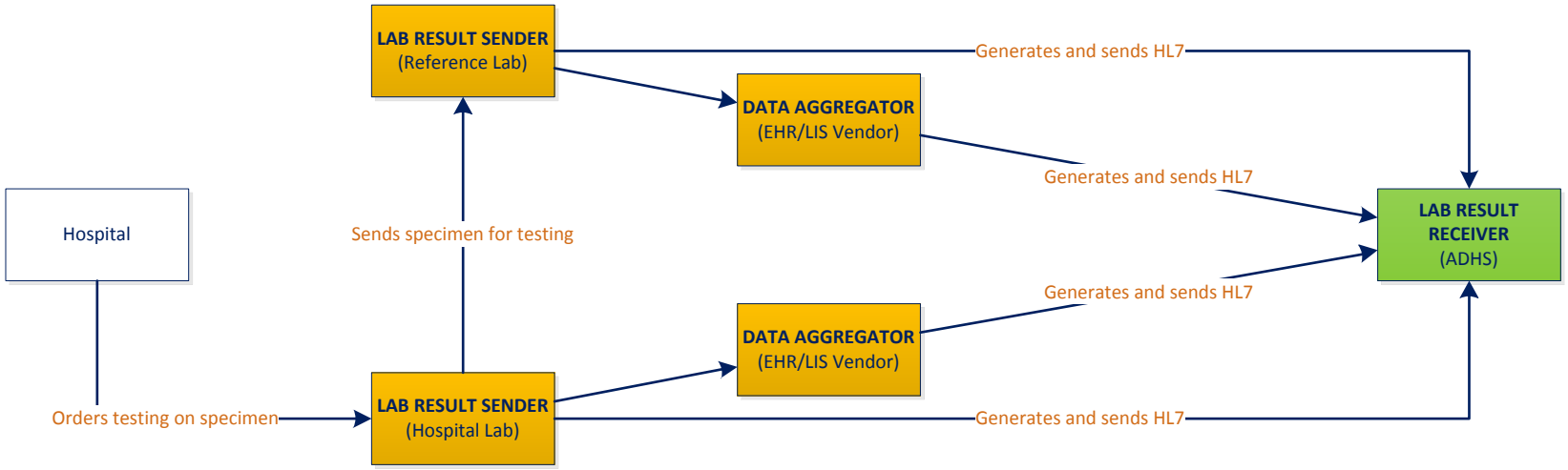
INTRODUCTION

The Arizona Department of Health Services (ADHS) is excited to release the Arizona Electronic Laboratory Reporting (AZ ELR) Implementation Guide! This guide provides standard, unambiguous specifications for the electronic transfer of laboratory result findings from testing sources to ADHS. The AZ ELR Implementation Guide is based on *HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health (US Realm), Release 1* (ELR2PH), and has been further constrained in conformance with the source document to guide eligible facilities in Arizona to fulfill the Meaningful Use criteria for ELR as well as meet Arizona's public health reporting requirements. The AZ ELR Implementation Guide is not intended to replace the ELR2PH; rather, it is strongly advised that implementers refer to the source document for details and clarifications on the specifications outlined in this guide. Furthermore, it is highly recommended that implementers fully understand the HL7 concepts described in the source document prior to using this document for guidance. Additional information regarding HL7, ELR Meaningful Use eligibility and requirements, actual steps of the ELR implementation and transition process, ELR2PH, secure message transport methods, reporting requirements and many other resources can be obtained at www.azdhs.gov/meaningful-use.

OVERVIEW – USE CASE

The AZ ELR Implementation Guide is restricted to the use case describing an ELR batch transmission of laboratory reportable findings or laboratory-observation-based reportable communicable diseases from the sending entity to ADHS using an HL7 Version 2.5.1 message (see Figure 1.1). The sending entity must be capable of generating and transmitting an HL7 message containing laboratory results to ADHS, and may either be the aggregator of laboratory result data—e.g. the Electronic Health Record (EHR)/Laboratory Information System (LIS) vendor—or the laboratory itself. In a scenario where the specimen is sent from the facility to the reference laboratory for testing, the reference laboratory—or its data aggregator—must play the role of the sending entity. The receiving entity is identified as the public health agency that possesses the capability to receive and process the HL7 message. In this use case, ADHS is the receiving entity.

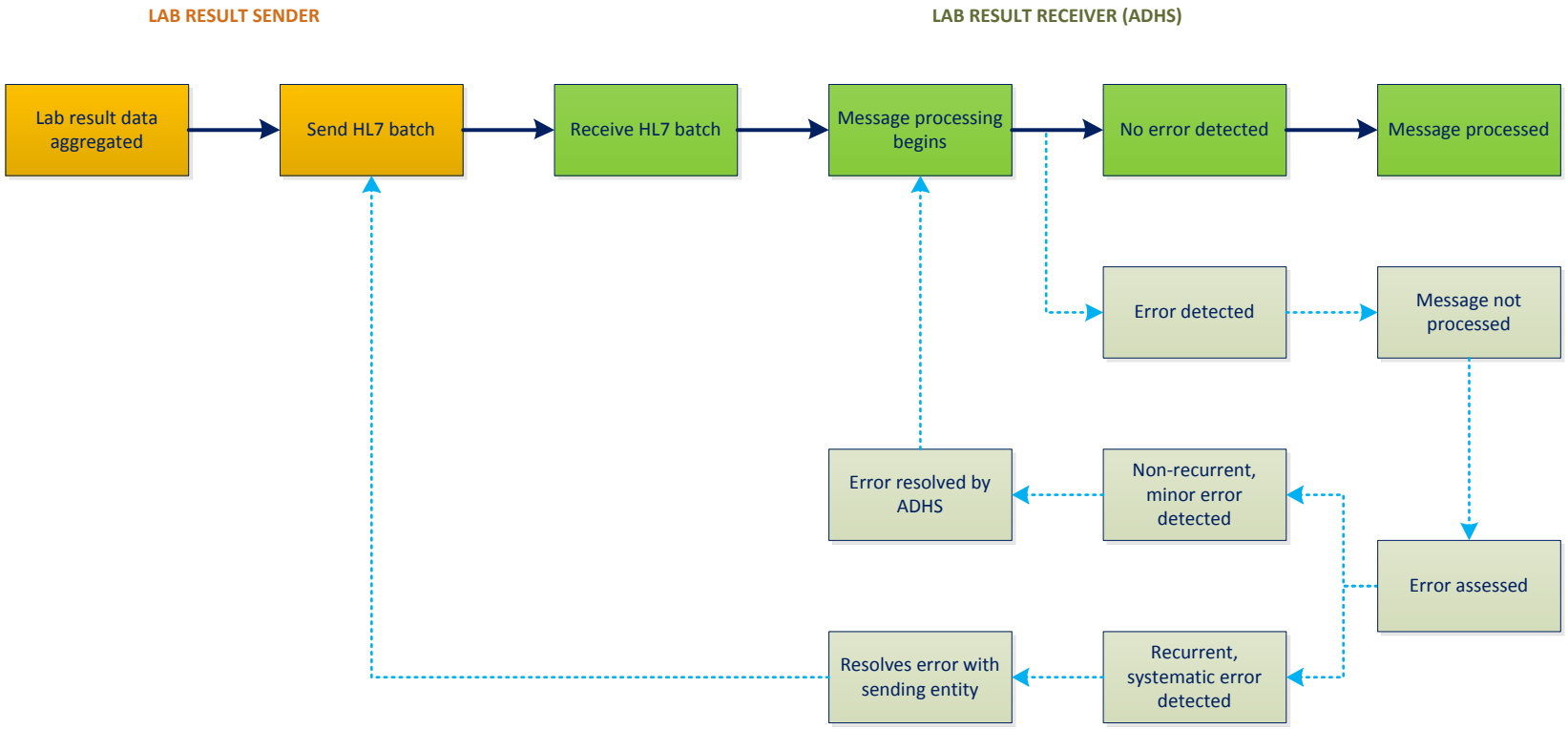
FIGURE 1.1 – AZ ELR Implementation Guide Use Case Model



OVERVIEW – INTERACTION DYNAMICS

The AZ ELR Implementation Guide supports a regularly monitored, unidirectional batch messaging protocol in which the laboratory result sender transmits a single batch containing messages to ADHS at an appointed time on a daily basis (see Figure 1.2). Since the batch messaging protocol does not allow an option for acknowledgment messages to be exchanged between the sending and receiving applications, acknowledgment messages are outside the scope of this document and therefore not further discussed. In a scenario where the receiving application encounters an error in the incoming HL7 message, ADHS examines the source of error and resolves the issue in one of two following methods. First, if the error is found to be minor and non-recurrent upon assessment, ADHS internally resolves the error and manually resubmits the message to be processed. Conversely, if a systematic, recurrent error by the sender is discovered, ADHS works directly with the sending entity to identify root causes of the error and ensure that the fixes are put in place, after which the sending entity resubmits the message.

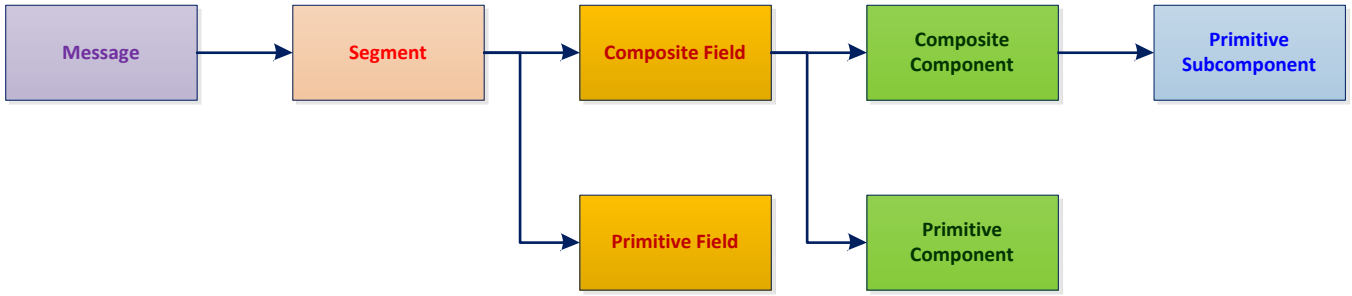
FIGURE 1.2 – Batch Messaging Protocol Interaction Model



HL7 MESSAGE FRAMEWORK

To use this guide properly, implementers must first understand the basics of the HL7 message framework including the way in which information is organized in a **message** (see Figure 1.3). A standard HL7 **message** is comprised of a group of **segments**, which are arranged in a defined sequence. Each **segment** is comprised of a group of **fields** that are also organized in a defined sequence. **Fields** may be divided into **components**, which may be further divided into **subcomponents**, depending on their *data types*. *Data types* are largely divided into two categories: (1) *Primitive* data types are populated as string or numeric values. (2) *Composite* data types are an arranged group of values. For example, fields with composite data types are divided into a group of **components**. **Components** may again be either primitive or composite. **Components** with composite data types consist of **subcomponents**, which are always assigned primitive data types.

FIGURE 1.3 – Data Element Hierarchy in a Standard HL7 Message



In constructing a message, special characters must be designated as delimiter values to separate segments, fields, components and subcomponents. Furthermore, special characters may also distinguish multiple occurrences of data elements and special formats within a field where allowed (see Table 1.1). These characters are designated in the first two fields of the message header segment (MSH)—segment beginning a new message—and establish delimitation rules throughout the message. In the case of batch messaging protocol, delimiter values also appear in the first two fields of the file header (FHS) and batch header (BHS) segments. Specific examples on how delimiter values are used, along with detailed explanations, are provided in the subsequent pages of this guide. Standard HL7 delimiters shown in Table 1.1 are required for Arizona ELR implementations. Further information on delimiters can be obtained in the ELR2PH.

TABLE 1.1 – HL7 Standard Message Delimiters

Delimiter	Required Value	Description
Segment Terminator	<cr>	ASCII-013 carriage return character used to terminate a segment record. This value cannot be changed by implementers.
Field Separator	|	Separates two adjacent data fields within a segment. It also separates the segment ID from the first data field in each segment.
Component Separator	^	Separates adjacent components within a field.
Repetition Separator	~	Separates multiple occurrences of a field where allowed.
Escape Character	\	Used in instances where special character formatting is needed. More information is available in the ELR2PH.
Subcomponent Separator	&	Separates adjacent subcomponents within a component.

HL7 MESSAGING CONVENTIONS

The HL7 messaging conventions used in this implementation guide strictly adhere to the ELR2PH. Implementers should fully comprehend the attributes of each message element—e.g. length, repetition, usage, etc. Table 1.2 provides definitions of the attributes that appear throughout this guide. It is important to note that the descriptions provided below have been summarized from the source document, and that further discussions and clarifications are available in the ELR2PH.

TABLE 1.2 – Message Element Attributes

Attribute	Definition
SEQ	Sequence of the elements as numbered in the HL7 message element.
Message Structure	Contains three-character code for the segments—e.g. MSH, SFT, PID—and the following abstract syntax: **XXX** Required **[XXX]** Optional **{ XXX }** Repeating **[{ XXX }]** Optional and repeating – synonymous with **{[XXX]}** Segment groups can also be expressed within the braces and brackets.
LEN	Maximum length of the element. Lengths are provided only for primitive data types, and should be considered recommendations, not absolutes. The length attribute may contain a character indicating how the data may be truncated by a receiver. These characters are defined as follows: **=** Truncation by receiver not allowed **#** Truncation by receiver allowed No character indicates the truncation behavior is not defined.
DT	Data type. Determines the format in which the field, component or subcomponent is to be populated.
Usage	Usage of the segment, segment group or field. **R** Required **RE** Required, but can be empty if the information is unavailable **C** Requirement is conditional on other field(s) – Description/Comments section describes the algorithm defining the conditionality. **X** Not used in this guide
Cardinality	Minimum and maximum number of times the message element may appear. **[0..0]** Never present **[0..1]** May be omitted or have one occurrence **[0..n]** May be omitted or have *n* occurrences **[1..1]** Exactly one occurrence **[1..n]** At least one occurrence, and at most *n* occurrences **[m..n]** At least *m* occurrences, and at most *n* occurrences
TBL#	HL7 defined or external table used for the field.
Element Name	HL7 descriptor of the message element.
Required/Recommended/ Literal Value	Value and usage designations for components and subcomponents. **Required** Element is required for the message to be considered complete. **Recommended** Element must be populated if the information is available. **Literal** Absolute value for the element that must appear in the message exactly as shown.
Description/Comments	Context and usage for the element.

HL7 ORU MESSAGE STRUCTURE

This guide is specific to the ORU use case, which supports the unsolicited transmission of laboratory results from testing sources to the Arizona Department of Health Services. The ORU message structure in this guide has been simplified from the ELR2PH with additional restrictions to eliminate ambiguity around data element usage requirements while omitting unused segments and attributes (see Table 1.3). In other words, this guide specifies which elements are required for satisfactory reporting of laboratory results to public health in Arizona.

As shown below, a **file** is comprised of a single **batch** containing up to 10,000 **messages**. Enclosed within each **message** is a series of segments followed by the **Order Observation** group, which is comprised of the OBR segment and the **Observation** group. The Observation group is composed of OBX and NTE segments. Each segment group, as well as the individual segment, possesses its own attributes. For example, a single message may contain up to 50 occurrences of the Order Observations group, which in turn may have as many as 50 Observation groups. Within the Observation group, each OBX segment can precede up to 30 NTE segments. At its maximum, a single message may have as many as 50 OBR segments, 2,500 OBX segments and 75,000 NTE segments as long as they are properly arranged in their respective segment groups.

TABLE 1.3 – ORU^R01^ORU_R01 Using Batch Protocol

Message Structure	Segment Description	Usage	Cardinality
FHS	File Header	R	[1..1]
BHS	Batch Header	R	[1..1]
{	*—Message begins*	R	[1..10000]
MSH	Message Header	R	[1..1]
{ SFT }	Software	R	[1..10]
PID	Patient Identification	R	[1..1]
[NK1]	Next of Kin/Associated Parties	RE	[0..1]
ORC	Common Order	R	[1..1]
{	*—Order Observation begins*	R	[1..50]
OBR	Observation Request	R	[1..1]
{	*—Observation begins*	R	[1..50]
OBX	Observation/Result	R	[1..1]
[{ NTE }]	Notes and Comments for OBX	RE	[0..30]
}	*—Observation ends*		
}	*—Order Observation ends*		
SPM	Specimen Information	R	[1..1]
}	*—Message ends*		
BTS	Batch Trailer	R	[1..1]
FTS	File Trailer	R	[1..1]

HOW TO READ HL7 SEGMENTS

Reading an HL7 message can be challenging given the puzzle-like syntaxes and numerous symbols. This section provides a quick tutorial for first-time implementers of HL7 on the basics regarding how to read, understand and analyze the contents embedded within HL7 segments.

Figure 1.4 illustrates a sample MSH segment, in which the fields and components are read in sequence. The segment begins with a three-letter segment ID that determines the arrangement of contents throughout the rest of the segment. MSH-1 indicates the field separator and MSH-2 indicates the set of delimiter values. Designating special characters in the first two fields of MSH establishes delimitation rules throughout the message, allowing MSH-3 and all subsequent segments to be separated using the appropriate delimiter values. In the case of batch messaging protocol, delimiter values also appear in the first two fields of the file header (FHS) and batch header (BHS) segments. Special characters must always be positioned in the fixed order shown below.

FIGURE 1.4 – Sample Message Header Segment

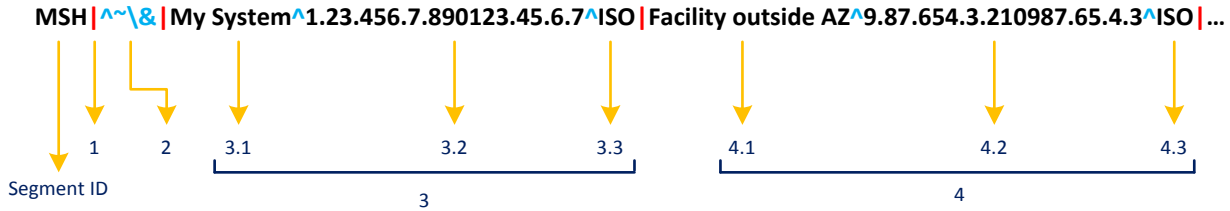


Figure 1.5 demonstrates the process of reading the fields, components and subcomponents within a sample PID segment. It is important to note that PID-1 is the value populated after the first field separator. This is because the delimiter values are already established in the MSH segment, which precedes the PID segment. PID-2 is not present since there is no populated value between the enclosing field separators. PID-3 is a large field comprised of components and subcomponents, all of which are separated by the designated delimiters. PID-3.2 and 3.3 are not present for the same reason that applies to PID-2. PID-3.4 and 3.6 are each divided into three subcomponents. Repetition separator marks the end of the first occurrence of PID-3 as well as the beginning of the second occurrence, which begins with its own first component.

FIGURE 1.5 – Sample Patient Identifier Segment

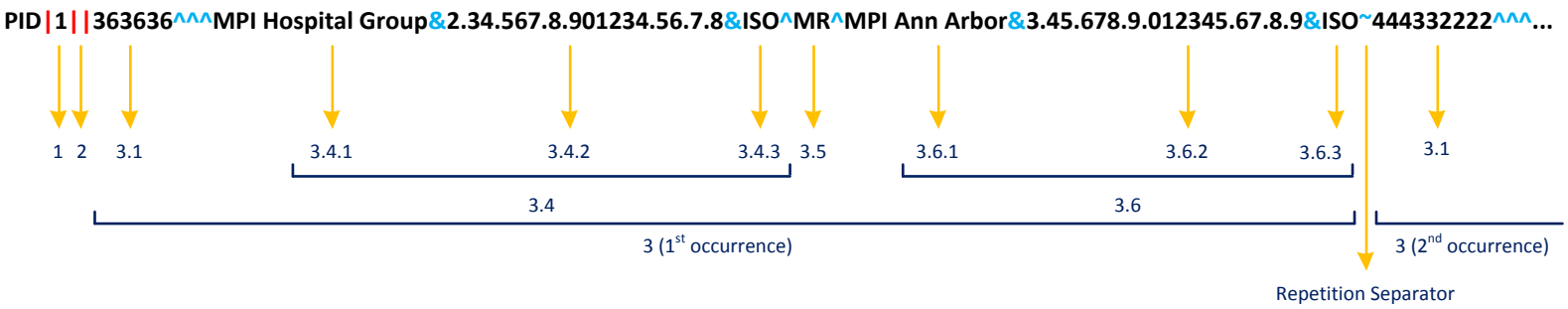
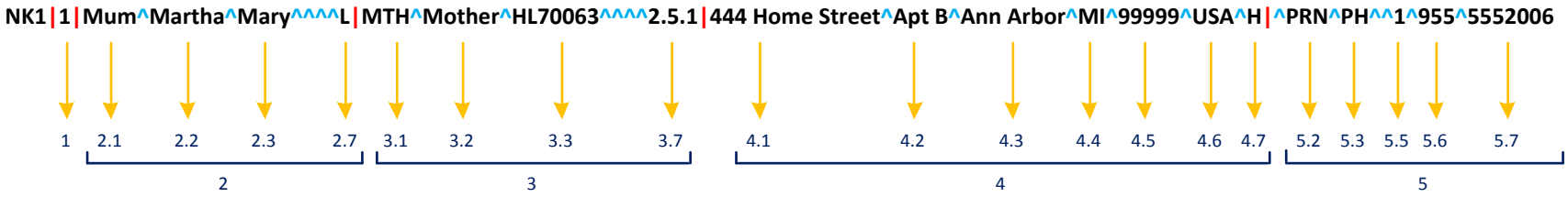


Figure 1.6 illustrates a sample NK1 segment where fields and components are read in sequence. As with all segments following MSH, NK1-1 is the value populated after the first field separator. NK1-2 and NK1-3 are each comprised of multiple components, some of which do not contain values. Whereas seven components appear within NK1-3 in the example below, the segment attribute table describing NK1 in the subsequent pages of this guide outlines eight possible components that can be populated within NK1-3. Moreover, implementers who have previously read the ELR2PH will recall that the CWE data type designated for this field originally allows up to 22 possible components.

In a given segment, field or component, implementers are not required to insert delimiters if no information is present after the preceding value. For example, since NK1-3.7 is the last component populated in the field, no subsequent component separators are necessary. Instead, a field separator ends NK1-3 and begins NK1-4. Although this rule eliminates unnecessary additions and potential for errors, it does not exempt implementers from populating all required data elements and fulfilling the reporting requirements. The last field, NK1-5, begins with a component separator, which indicates that the first component is not present. The remaining components are read in sequence until no additional information is available. Even though NK1 can contain up to 39 fields, the segment terminates after the last available value is populated in field 5.

FIGURE 1.6 – Sample Next of Kin Segment



The segment terminator, <cr>, is the ASCII-013 carriage return character used to terminate segments. It is important to note that the segment terminator is not a literal value that visibly appears at the end of segments and therefore must not be manually entered into a message. Special formatting is not essential to the use case described in this implementation guide. Hence, the examples regarding the use of escape characters are not covered in this section. Implementers who wish to learn more about the escape characters are encouraged to refer to the ELR2PH for detailed explanations and examples.

Subsequent pages provide detailed specifications of the segments used in the AZ ELR Implementation Guide. Data elements that are not supported in this guide have been shaded gray for distinction. Example data is provided at the bottom of each page for quick reference and guidance. With the exception of values that are specified as literal values, example data should not be used when testing with ADHS. Implementers are encouraged to refer to the ELR2PH as well as the HL7 Standard for comprehensive overview of data types and any additional clarifications.

In addition, this implementation guide requires data elements to be coded appropriately using standard vocabulary systems, which includes HL7 tables, user-defined code tables, Logical Observation Identifiers Names and Codes (LOINC), Systematized Nomenclature of Medicine—Clinical Terms (SNOMED CT), Unified Code for Units of Measure (UCUM), etc. All vocabulary coding systems are conveniently available for reference at the Centers for Disease Control and Prevention, Public Health Information Network Vocabulary Access and Distribution System (CDC PHIN VADS) website: https://phinvads.cdc.gov/vads/SearchVocab.action.

FHS – FILE HEADER SEGMENT

This segment is used as the lead-in to a file (group of batches).

FHS – File Header Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1	ST	R	[1..1]		Field Separator	**|**	
2	4	ST	R	[1..1]		Encoding Characters	**^~\&**	**^** = Component Separator **~** = Repetition Separator **** = Escape Character **&** = Subcomponent Separator
3		HD	R	[1..1]		File Sending Application	Application Name **^** Application OID **^ISO**	A unique OID must be obtained for the sending application.
4		HD	R	[1..1]		File Sending Facility	Facility Name **^** Facility OID **^ISO** OR Lab Name **^** CLIA ID **^CLIA**	A unique OID must be obtained for the sending facility. For labs generating files, CLIA ID is allowed as an alternative to the OID.
5		HD	R	[1..1]		File Receiving Application	**AZ.DOH.ELR^2.16.840.1.114222.4.3.3.2.9.3^ ISO**	
6		HD	R	[1..1]		File Receiving Facility	**AZDOH^2.16.840.1.114222.4.1.142^ISO**	
7		TS	R	[1..1]		File Creation Date/Time	YYYYMMDDHHMMSS [.SSSS] +/- ZZZZ	Minimum granularity is to the second. Time zone off set is required.
8	1..40=	ST	X	[0..0]		File Security		Not used.
9	1..40=	ST	X	[0..0]		File Name/ID		Not used.
10	1..80=	ST	X	[0..0]		File Header Comment		Not used.
11	1..20=	ST	X	[0..0]		File Control ID		Not used.
12	1..20=	ST	X	[0..0]		Reference File Control ID		Not used.

Example Data:

FHS|^~\&|My System^1.23.456.7.890123.45.6.7^ISO|My Facility^9.87.654.3.210987.65.4.3^ISO|AZ.DOH.ELR^2.16.840.1.114222.4.3.3.2.9.3^ISO|
AZDOH^2.16.840.1.114222.4.1.142^ISO|20121125153045-0800

BHS – BATCH HEADER SEGMENT

This segment is used as the lead-in to a batch (group of messages).

BHS – Batch Header Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1	ST	R	[1..1]		Field Separator	**|**	
2	4	ST	R	[1..1]		Encoding Characters	**^~\&**	**^** = Component Separator **~** = Repetition Separator **** = Escape Character **&** = Subcomponent Separator
3		HD	R	[1..1]		Batch Sending Application	Application Name **^** Application OID **^ISO**	A unique OID must be obtained for the sending application.
4		HD	R	[1..1]		Batch Sending Facility	Facility Name **^** Facility OID **^ISO** OR Lab Name **^** CLIA ID **^CLIA**	A unique OID must be obtained for the sending facility. For labs generating batches, CLIA ID is allowed as an alternative to the OID.
5		HD	R	[1..1]		Batch Receiving Application	**AZ.DOH.ELR^2.16.840.1.114222.4.3.3.2.9.3^ ISO**	
6		HD	R	[1..1]		Batch Receiving Facility	**AZDOH^2.16.840.1.114222.4.1.142^ISO**	
7		TS	R	[1..1]		Batch Creation Date/Time	YYYYMMDDHHMMSS [.SSSS] +/- ZZZZ	Minimum granularity is to the second. Time zone off set is required.
8	1..40=	ST	X	[0..0]		Batch Security		Not used.
9	1..40=	ST	X	[0..0]		Batch Name/ID/Type		Not used.
10	1..80=	ST	X	[0..0]		Batch Header Comment		Not used.
11	1..20=	ST	X	[0..0]		Batch Control ID		Not used.
12	1..20=	ST	X	[0..0]		Reference Batch Control ID		Not used.

Example Data:

BHS|^~\&|My System^1.23.456.7.890123.45.6.7^ISO|My Facility^9.87.654.3.210987.65.4.3^ISO|AZ.DOH.ELR^2.16.840.1.114222.4.3.3.2.9.3^ISO|
AZDOH^2.16.840.1.114222.4.1.142^ISO|20121125153045-0800

MSH – MESSAGE HEADER SEGMENT

This segment is used as a lead-in to a message. It contains information describing how to parse and process the message such as identification of message delimiters, sender, receiver, message type, timestamp, etc.

MSH – Message Header Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1	ST	R	[1..1]		Field Separator	**|**	
2	4	ST	R	[1..1]		Encoding Characters	**^~\&**	**^** = Component Separator **~** = Repetition Separator **** = Escape Character **&** = Subcomponent Separator
3		HD	R	[1..1]		Sending Application	Application Name **^** Application OID **^ISO**	A unique OID must be obtained for the sending application.
4		HD	R	[1..1]		Sending Facility	Facility Name **^** Facility OID **^ISO** OR Lab Name **^** CLIA ID **^CLIA**	A unique OID must be obtained for the sending facility. For labs generating messages, CLIA ID is allowed as an alternative to the OID.
5		HD	R	[1..1]		Receiving Application	**AZ.DOH.ELR^2.16.840.1.114222.4.3.3.2.9.3^ ISO**	
6		HD	R	[1..1]		Receiving Facility	**AZDOH^2.16.840.1.114222.4.1.142^ISO**	
7		TS	R	[1..1]		Date/Time of Message	YYYYMMDDHHMMSS [.SSSS] +/- ZZZZ	Minimum granularity is to the second. Time zone off set is required.
8	1..40=	ST	X	[0..0]		Security		Not used.
9		MSG	R	[1..1]	9999	Message Type	**ORU^R01^ORU_R01**	
10	1..50=	ST	R	[1..1]		Message Control ID	Date/Time of Message **–** Accession Number	String that uniquely identifies the message. MSH-3 + MSH-10 = Globally Unique Identifier
11	1	PT	R	[1..1]		Processing ID	Processing Mode ID	**P** = Production **D** = Debugging **T** = Training

Example Data:

MSH|^~\&|My System^1.23.456.7.890123.45.6.7^ISO|My Facility^9.87.654.3.210987.65.4.3^ISO|AZ.DOH.ELR^2.16.840.1.114222.4.3.3.2.9.3^ISO|
AZDOH^2.16.840.1.114222.4.1.142^ISO|20121125153045-0800||ORU^R01^ORU_R01|20121125153045-0800-D22147|P|2.5.1|||NE|NE|||||
AZELRIG^ADHS^2.16.840.1.113883.9.31^ISO

MSH – Message Header Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
12		VID	R	[1..1]		Version ID	**2.5.1**	
13		NM	X	[0..0]		Sequence Number		Not used.
14	1.. 180=	ST	X	[0..0]		Continuation Pointer		Not used.
15	2..2	ID	R	[1..1]	0155	Accept Ack. Type	**NE**	
16	2..2	ID	R	[1..1]	0155	Application Ack. Type	**NE**	
17	3..3	ID	X	[0..0]		Country Code		Not used.
18	5..15	ID	X	[0..0]	0211	Character Set		Not used.
19		CWE	X	[0..0]		Msg. Principal Language		Not used.
20	3..13	ID	X	[0..0]	0356	Alternate Character Set		Not used.
21		EI	R	[1..1]		Msg. Profile Identifier	**AZELRIG^ADHS^2.16.840.1.113883.9.31^ISO**	

Example Data:

MSH|^~\&|My System^1.23.456.7.890123.45.6.7^ISO|My Facility^9.87.654.3.210987.65.4.3^ISO|AZ.DOH.ELR^2.16.840.1.114222.4.3.3.2.9.3^ISO|
AZDOH^2.16.840.1.114222.4.1.142^ISO|20121125153045-0800||ORU^R01^ORU_R01|20121125153045-0800-D22147|P|2.5.1|||NE|NE|||||
AZELRIG^ADHS^2.16.840.1.113883.9.31^ISO

SFT – SOFTWARE SEGMENT

This segment provides information about the sending application or other applications that manipulate the message before the receiving application processes the message. The laboratory result sender is required to populate the first SFT segment. Each application transforming the message must also add an SFT segment. Each application routing or acting as a conduit may add an SFT segment but is not required to do so.

SFT – Software Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1		XON	R	[1..1]		Software Vendor Organization	Organization Name **^** Name Type (TBL# 0204) **^^^^** Assigning Authority Name **&** OID **&ISO^** Organization Identifier Type (TBL# 0203) **^** Assigning Facility Name **&** OID **&ISO^^** Organization Identifier	Name of the lab result sender, vendor or application manipulating the message. Organization Name is required at minimum. If the Organization Identifier is present, the Assigning Authority and the Organization Identifier Type are required. For labs, CLIA ID is allowed as an alternative to the OID. If a subcomponent is populated, all remaining subcomponents within the component must also be populated.
2	1..15#	ST	R	[1..1]		Software Release Ver.	Version ID/Release ID	Version of the software manipulating or routing the message.
3	1..20#	ST	R	[1..1]		Software Product Name	Product Name	Name of the software manipulating or routing the message.
4	1..20#	ST	R	[1..1]		Software Binary ID	Binary ID	Binary ID of the software manipulating or routing the message.
5		TX	X	[1..1]		Software Product Info.		Not used.
6		TS	R	[1..1]		Software Install Date	YYYYMMDD	

Example Data:

SFT|Level Seven Healthcare, Inc.|4.1|MyLab Management Software|108735A||2010050514

PID – PATIENT IDENFITICATION SEGMENT

This segment provides basic demographics regarding the subject of the laboratory observation.

PID – Patient Identification Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1..4	SI	R	[1..1]		Set ID – PID	**1**	
2		CX	X	[0..0]		Patient ID		Deprecated as of *HL7 Version 2.3.1.* Not used.
3		CX	R	[1..10]		Patient Identifier List	ID Number **^^^** Assigning Authority Name **&** OID **&ISO^** Identifier Type (TBL# 0203) **^** Assigning Facility Name **&** OID **&ISO**	For labs assigning identifiers, CLIA ID is allowed as an alternative to the OID. If a subcomponent is populated, all remaining subcomponents within the component must also be populated.
4		CX	X	[0..0]		Alternative Patient ID – PID		Deprecated as of *HL7 Version 2.3.1.* Not used.
5		XPN	R	[1..1]		Patient Name	Last Name **^** First Name **^** Middle Name/Initial **^** Suffix **^** Prefix **^^L^^^^^^^** Professional Suffix (TBL# 0360)	Reporting of this field with the patient's legal last and first name is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
6		XPN	X	[0..0]		Mother's Maiden Name		Not used.
7		TS	R	[1..1]		Date/Time of Birth	YYYYMMDD [HH[MM[SS[.SSSS]]]] +/- ZZZZ	Minimum granularity is to the day. If time is entered, time zone off set is required. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.

Example Data:

PID|1||363636^^^MPI Hospital Group&2.34.567.8.901234.56.7.8&ISO^MR^MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO~444332222^^^SSA&2.16.840.1.113883.3.184&ISO^SS||Everyman^Adam^A^III^DR^^L^^^^^^^PHD|Mum^Martha^Mary^^^^L|19750602114500.0000-0500|M||2106-3^White^HL70005^^^^2.5.1|2222 Home Street^^Ann Arbor^MI^99999^USA^H||^PRN^PH^^1^955^5552004~^ORN^CP^^1^955^5552937|^WPN^PH^^1^955^5551234^007^Call between 8am and 5pm.|||||||U^Unknown^HL70189^^^^2.5.1|||||||N|||201302011059-0500|My Facility^1.23.456.7.890123.45.6.7^ISO

PID – Patient Identification Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
8	1..20=	IS	R	[1..1]	0001	Administrative Sex	Sex (TBL# 0001)	Must be populated with a **U** if sex is unknown. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
9		XPN	X	[0..0]		Patient Alias		Deprecated as of *HL7 Version 2.4.* Not used.
10		CWE	RE	[0..1]	0005	Race	Race (TBL# 0005) **^** Description **^HL70005^** Alternate Code **^** Alternate Text **^** Alternate Coding System (TBL# 0396) **^2.5.1^** Alternate Coding Sys. Ver. ID **^** Original Text	If populated, the first three components and the Version ID (2.5.1) are required.
11		XAD	RE	[0..1]		Patient Address	Street Address **^** Other Designation **^** City **^** State/Province **^** ZIP/Postal Code **^** Country **^** Address Type (TBL# 0190)	If populated, Street Address, City, State and ZIP are required. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
12	1..20=	IS	X	[0..0]		County Code		Deprecated as of *HL7 Version 2.3.* Not used.
13		XTN	RE	[0..1]		Phone Number – Home	**^** Telecommunication Use Code (TBL# 0201) **^** Equipment Type (TBL# 0202) **^^** Country Code **^** Area/City Code **^** Local Number **^** Extension **^** Comments	If populated, the Area/City Code and the Local Number are required. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
14		XTN	RE	[0..1]		Phone Number – Business	**^** Telecommunication Use Code (TBL# 0201) **^** Equipment Type (TBL# 0202) **^^** Country Code **^** Area/City Code **^** Local Number **^** Extension **^** Comments	If populated, the Area/City Code and the Local Number are required.

Example Data:

PID|1||363636^^^MPI Hospital Group&2.34.567.8.901234.56.7.8&ISO^MR^MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO~444332222^^^SSA&2.16.840.1.113883.3.184&ISO^SS||Everyman^Adam^A^III^DR^^L^^^^^^^PHD|Mum^Martha^Mary^^^^L|19750602114500.0000-0500|M||2106-3^White^HL70005^^^^2.5.1|2222 Home Street^^Ann Arbor^MI^99999^USA^H||^PRN^PH^^1^955^5552004~^ORN^CP^^1^955^5552937|^WPN^PH^^1^955^5551234^007^Call between 8am and 5pm.|||||||U^Unknown^HL70189^^^^2.5.1|||||||N|||201302011059-0500|My Facility^1.23.456.7.890123.45.6.7^ISO

PID – Patient Identification Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
15		CWE	X	[0..0]		Primary Language		Not used.
16		CWE	X	[0..0]	0002	Marital Status		Not used.
17		CWE	X	[0..0]	0006	Religion		Not used.
18		CX	X	[0..0]		Patient Account No.		Not used.
19		ST	X	[0..0]		Social Security No. – Patient		Not used.
20		DLN	X	[0..0]		Driver's License No. – Patient		Not used.
21		CX	X	[0..0]		Mother's Identifier		Not used.
22		CWE	R	[1..1]	0189	Ethnic Group	Ethnicity (TBL# 0189) **^** Description **^HL70189^** Alternate Code **^** Alternate Text **^** Alternate Coding System (TBL# 0396) **^2.5.1^** Alt. Coding Sys. Ver. ID **^** Original Text	The first three components and the Version ID (2.5.1) are required at minimum. If ethnicity is unknown, the field must be populated as follows: **U^Unknown^HL70189^^^^2.5.1**
23	1.. 250#	ST	X	[0..0]		Birth Place		Not used.
24	1..1	ID	X	[0..0]	0136	Multiple Birth Indicator		Not used.
25	1..2=	NM	X	[0..0]		Birth Order		Not used.
26		CWE	X	[0..0]	0171	Citizenship		Not used.
27		CWE	X	[0..0]	0172	Veterans Military Status		Not used.

Example Data:

PID|1||363636^^^MPI Hospital Group&2.34.567.8.901234.56.7.8&ISO^MR^MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO~444332222^^^SSA&2.16.840.1.113883.3.184&ISO^SS||Everyman^Adam^A^III^DR^^L^^^^^^^PHD|Mum^Martha^Mary^^^^L|19750602114500.0000-0500|M||2106-3^White^HL70005^^^^2.5.1|2222 Home Street^^Ann Arbor^MI^99999^USA^H||^PRN^PH^^1^955^5552004~^ORN^CP^^1^955^5552937|^WPN^PH^^1^955^5551234^007^Call between 8am and 5pm.|||||||U^Unknown^HL70189^^^^2.5.1|||||||N|||201302011059-0500|My Facility^1.23.456.7.890123.45.6.7^ISO

PID – Patient Identification Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
28		CWE	X	[0..0]		Nationality		Deprecated as of *HL7 Version 2.4.* Not used.
29		TS	RE	[0..1]		Patient Death Date and Time	YYYYMMDD [HH[MM[SS[.SSSS]]]] +/- ZZZZ	If populated, the minimum granularity is to the day. If time is entered, time zone off set is required.
30	1..1	ID	RE	[0..1]	0136	Patient Death Indicator	Yes/No Indicator (TBL# 0136)	If PID-29 is valued, this field must be a **Y** since the patient is known to be deceased.
31	1..1	ID	X	[0..0]	0136	ID Unknown Indicator		Not used.
32	1..20=	IS	X	[0..0]	0445	Identity Reliability Code		Not used.
33		TS	RE	[0..1]		Last Update Date/Time	YYYYMMDD [HH[MM[SS[.SSSS]]]] +/- ZZZZ	If populated, the minimum granularity is to the day. If time is entered, time zone off set is required.
34		HD	RE	[0..1]		Last Update Facility	Updating Facility **^** Facility OID **^ISO**	Identifies the facility that last updated demographics. For labs, CLIA ID is allowed as an alternative to the OID. If populated, all components are required.
35		CWE	X	[0..0]		Species Code		Not used.
36		CWE	X	[0..0]		Breed Code		Not used.
37	1..80=	ST	X	[0..0]		Strain		Not used.
38		CWE	X	[0..0]	0429	Production Class Code		Not used.
39		CWE	X	[0..0]		Tribal Citizenship		Not used.

Example Data:

PID|1||363636^^^MPI Hospital Group&2.34.567.8.901234.56.7.8&ISO^MR^MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO~444332222^^^SSA&2.16.840.1.113883.3.184&ISO^SS||Everyman^Adam^A^III^DR^^L^^^^^^^PHD|Mum^Martha^Mary^^^^L|19750602114500.0000-0500|M||2106-3^White^HL70005^^^^2.5.1|2222 Home Street^^Ann Arbor^MI^99999^USA^H||^PRN^PH^^1^955^5552004~^ORN^CP^^1^955^5552937|^WPN^PH^^1^955^5551234^007^Call between 8am and 5pm.|||||||U^Unknown^HL70189^^^^2.5.1|||||||N|||201302011059-0500|My Facility^1.23.456.7.890123.45.6.7^ISO

NK1 – NEXT OF KIN SEGMENT

This segment documents the patient's next of kin.

NK1 – Next of Kin Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1..4	SI	R	[1..1]		Set ID – NK1	**1**	If this segment is present, this field is required.
2		XPN	R	[1..1]		Name	Last Name **^** First Name **^** Middle Name/Initial **^** Suffix **^** Prefix **^^** Name Type (TBL# 0200) **^^^^^^^** Professional Suffix (TBL# 0360)	If this segment is present, this field is required with Last Name, First Name and Name Type.
3		CWE	RE	[0..1]	0063	Relationship	Relationship (TBL# 0063) **^** Description **^HL70063^** Alternate Code **^** Alternate Text **^** Alternate Coding System (TBL# 0396) **^2.5^** Alternate Coding Sys. Ver. ID **^** Original Text	If populated, the first three components and the Version ID (2.5) are required.
4		XAD	RE	[0..1]		Address	Street Address **^** Other Designation **^** City **^** State/Province **^** ZIP/Postal Code **^** Country **^** Address Type (TBL# 0190)	If populated, Street Address, City, State and ZIP are required.
5		XTN	RE	[0..1]		Phone Number	**^** Telecommunication Use Code (TBL# 0201) **^** Equipment Type (TBL# 0202) **^^** Country Code **^** Area/City Code **^** Local Number **^** Extension **^** Comments	If populated, the Area/City Code and the Local Number are required.
6		XTN	X	[0..0]		Business Phone Number		Not used.
7		CWE	X	[0..0]		Contact Role		Not used.
8		DT	X	[0..0]		Start Date		Not used.
9		DT	X	[0..0]		End Date		Not used.
10	1..60#	ST	X	[0..0]		Next of Kin Parties Job Title		Not used.
11		JCC	X	[0..0]		Next of Kin Job Code/Class		Not used.

Example Data:

NK1|1|Mum^Martha^Mary^^^^L|MTH^Mother^HL70063^^^^2.5|444 Home Street^Apt B^Ann Arbor^MI^99999^USA^H|^PRN^PH^^1^955^5552006

NK1 – Next of Kin Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
12		CX	X	[0..0]		Next of Kin Employee No.		Not used.
13		XON	X	[0..0]		Organization Name – NK1		Not used.
14		CWE	X	[0..0]		Marital Status		Not used.
15	1..20=	IS	X	[0..0]		Administrative Sex		Not used.
16		TS	X	[0..0]		Date/Time of Birth		Not used.
17	1..20=	IS	X	[0..0]		Living Dependency		Not used.
18	1..20=	IS	X	[0..0]		Ambulatory Status		Not used.
19		CWE	X	[0..0]		Citizenship		Not used.
20		CWE	X	[0..0]		Primary Language		Not used.
21	1..20=	IS	X	[0..0]		Living Arrangement		Not used.
22		CWE	X	[0..0]		Publicity Code		Not used.
23	1..1	ID	X	[0..0]		Protection Indicator		Not used.
24	1..20=	IS	X	[0..0]		Student Indicator		Not used.
25		CWE	X	[0..0]		Religion		Not used.
26		XPN	X	[0..0]		Mother's Maiden Name		Not used.
27		CWE	X	[0..0]		Nationality		Not used.

Example Data:

NK1|1|Mum^Martha^Mary^^^^L|MTH^Mother^HL70063^^^^2.5|444 Home Street^Apt B^Ann Arbor^MI^99999^USA^H|^PRN^PH^^1^955^5552006

NK1 – Next of Kin Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
28		CWE	X	[0..0]		Ethnic Group		Not used.
29		CWE	X	[0..0]		Contact Reason		Not used.
30		XPN	X	[0..0]		Contact Person's Name		Not used.
31		XTN	X	[0..0]		Contact Person's Telephone Number		Not used.
32		XAD	X	[0..0]		Contact Person's Address		Not used.
33		CX	X	[0..0]		Next of Kin's Identifiers		Not used.
34	1..20=	IS	X	[0..0]		Job Status		Not used.
35		CWE	X	[0..0]		Race		Not used.
36	1..20=	IS	X	[0..0]		Handicap		Not used.
37	1..16#	ST	X	[0..0]		Contact Person Social Security Number		Not used.
38	1.. 250#	ST	X	[0..0]		Next of Kin Birth Place		Not used.
39	1..20=	IS	X	[0..0]		VIP Indicator		Not used.

Example Data:

NK1|1|Mum^Martha^Mary^^^^L|MTH^Mother^HL70063^^^^2.5|444 Home Street^Apt B^Ann Arbor^MI^99999^USA^H|^PRN^PH^^1^955^5552006

ORC – COMMON ORDER SEGMENT

This segment identifies basic information about the order for testing of the specimen including order identifiers, who ordered the test, order time, necessary actions, etc.

ORC – Common Order Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	2..2	ID	R	[1..1]	0119	Order Control	**RE**	
2		EI	RE	[0..1]		Placer Order Number	Placer Order ID **^** Placer Name **^** Placer OID **^ISO**	Order ID assigned by the entity placing the order for testing. It distinguishes the order from all other orders placed by the entity. If populated, all components are required. For labs, CLIA ID is allowed as an alternative to the OID.
3		EI	R	[1..1]		Filler Order Number	Filler Order ID **^** Filler Name **^** Filler OID **^ISO**	Order ID assigned by the entity performing the ordered test. It distinguishes the order from all other orders being processed. Accession numbers and specimen IDs often do not meet the criteria for a filler order number. For labs, CLIA ID is allowed as an alternative to the OID. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
4		EI	RE	[0..1]		Placer Group Number	Placer Order Group ID **^** Placer Name **^** Placer OID **^ISO**	Commonly called the requisition number. If populated, all components are required. For labs, CLIA ID is allowed as an alternative to the OID.
5	2..2	ID	X	[0..0]	0038	Order Status		Not used.

Example Data:

ORC|RE|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|||||||||0123456789^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD||^WPN^PH^^1^955^555^7723^041||||||MPI Ann Arbor|1005 Healthcare Drive^^Ann Arbor^MI^99999^USA^B|^WPN^PH^^1^955^555^7723|1005 Healthcare Drive^450B^Ann Arbor^MI^99999^USA^B

ORC – Common Order Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
6	1..1	ID	X	[0..0]	0121	Response Flag		Not used.
7		TQ	X	[0..0]		Quantity/ Timing		Deprecated as of *HL7 Version 2.5.* Not used.
8		EIP	X	[0..0]		Parent		Not used.
9		TS	X	[0..0]		Date/Time of Transaction		Not used.
10		XCN	X	[0..0]		Entered By		Not used.
11		XCN	X	[0..0]		Verified By		Not used.
12		XCN	R	[1..1]		Ordering Provider	Provider Identifier **^** Last Name **^** First Name **^** Middle Name/Initial **^** Suffix **^** Prefix **^^^** Assigning Authority **&** OID **&ISO^** Name Type (TBL# 0200) **^^^** Identifier Type (TBL# 0203) **^^^^^^^** Professional Suffix (TBL# 0360)	For the National Provider Identifier, use the following value set for the assigning authority: **CMS&2.16.840.1.113883.3.249&ISO** For labs, CLIA ID is allowed as an alternative to the OID. If a subcomponent is populated, all remaining subcomponents within the component must also be populated. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
13		PL	X	[0..0]		Enterer's Location		Not used.
14		XTN	R	[1..1]		Call Back Phone Number	**^** Telecommunication Use Code (TBL# 0201) **^** Equipment Type (TBL# 0202) **^^** Country Code **^** Area/City Code **^** Local Number **^** Extension **^** Comments	Phone number associated with the original order placer. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.

Example Data:

ORC|RE|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|||||||||0123456789^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD||^WPN^PH^^1^955^555^7723^041||||||MPI Ann Arbor|1005 Healthcare Drive^^Ann Arbor^MI^99999^USA^B|^WPN^PH^^1^955^555^7723|1005 Healthcare Drive^450B^Ann Arbor^MI^99999^USA^B

ORC – Common Order Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
15		TS	X	[0..0]		Order Effective Date/Time		Not used.
16		CWE	X	[0..0]		Order Control Code Reason		Not used.
17		CWE	X	[0..0]		Entering Organization		Not used.
18		CWE	X	[0..0]		Entering Device		Not used.
19		XCN	X	[0..0]		Action By		Not used.
20		CWE	X	[0..0]		Adv Beneficiary Notice Code		Not used.
21		XON	R	[1..1]		Ordering Facility Name	Organization Name **^** Name Type (TBL# 0204) **^^^^** Assigning Authority Name **&** OID **&ISO^** Organization Identifier Type (TBL# 0203) **^** Assigning Facility Name **&** OID **&ISO^^** Organization Identifier	Organization Name is required at minimum. If the Organization Identifier is present, the Assigning Authority and the Organization Identifier Type are required. For labs, CLIA ID is allowed as an alternative to the OID. If a subcomponent is populated, all remaining subcomponents within the component must also be populated.
22		XAD	R	[1..1]		Ordering Facility Address	Street Address **^** Other Designation **^** City **^** State/Province **^** ZIP/Postal Code **^** Country **^** Address Type (TBL# 0190)	Street Address, City, State and ZIP are required at minimum.
23		XTN	R	[1..1]		Ordering Facility Phone Number	**^** Telecommunication Use Code (TBL# 0201) **^** Equipment Type (TBL# 0202) **^^** Country Code **^** Area/City Code **^** Local Number **^** Extension **^** Comments	The Area/City Code and the Local Number are required at minimum.
24		XAD	R	[1..1]		Ordering Provider Address	Street Address **^** Other Designation **^** City **^** State/Province **^** ZIP/Postal Code **^** Country **^** Address Type (TBL# 0190)	Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.

Example Data:

ORC|RE|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|||||||||0123456789^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD||^WPN^PH^^1^955^555^7723^041||||||MPI Ann Arbor|1005 Healthcare Drive^^Ann Arbor^MI^99999^USA^B|^WPN^PH^^1^955^555^7723|1005 Healthcare Drive^450B^Ann Arbor^MI^99999^USA^B

ORC – Common Order Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
25		CWE	X	[0..0]		Order Status Modifier		Not used.
26		CWE	X	[0..0]		Advanced Beneficiary Override Reason		Not used.
27		TS	X	[0..0]		Filler's Expected Avail. Date/Time		Not used.
28		CWE	X	[0..0]	0177	Confidentiality Code		Not used.
29		CWE	X	[0..0]	0482	Order Type		Not used.
30		CNE	X	[0..0]	0483	Enterer Auth. Mode		Not used.
31		CWE	X	[0..0]		Parent Universal Service ID		Not used.

Example Data:

ORC|RE|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|||||||||0123456789^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD||^WPN^PH^^1^955^555^7723^041||||||MPI Ann Arbor|1005 Healthcare Drive^^Ann Arbor^MI^99999^USA^B|^WPN^PH^^1^955^555^7723|1005 Healthcare Drive^450B^Ann Arbor^MI^99999^USA^B

OBR – OBSERVATION REQUEST SEGMENT

This segment captures information about one test being performed on the specimen. Most importantly, OBR identifies the type of testing to be performed on the specimen and ties that information to the ORC segment.

OBR – Observation Request Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1..4	SI	R	[1..1]		Set ID – OBR	Set ID	Within each message, this number is **1** for the first occurrence of the segment; **2** for the second, **3** for the third, etc.
2		EI	RE	[0..1]		Placer Order Number	Value from ORC-2	If ORC-2 is populated, this field must contain the same value.
3		EI	R	[1..1]		Filler Order Number	Value from ORC-3	Must contain the same value as ORC-3.
4		CWE	R	[1..1]	LN	Universal Service Identifier	Test Code (LOINC) **^** Description **^LN^** Alternate Code **^** Alternate Text **^** Alt. Coding Sys. (TBL# 0396) **^** LOINC Ver. ID **^** Alt. Coding Sys. Ver. ID **^** Original Text	Identifies the requested observation or test. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
5		ID	X	[0..0]		Priority – OBR		Deprecated as of *HL7 Version 2.3.* Not used.
6		TS	X	[0..0]		Requested Date/Time		Deprecated as of *HL7 Version 2.3.* Not used.
7		TS	R	[1..1]		Observation Date/Time	YYYYMMDD [HH[MM[SS[.SSSS]]]] +/- ZZZZ	Date/time of specimen collection. If time is entered, time zone off set is required. If date/time is unknown, populate as: **0000** Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
8		TS	RE	[0..1]		Observation End Date/Time	YYYYMMDD [HH[MM[SS[.SSSS]]]] +/- ZZZZ	Required if the specimen was collected over a period of time. If time is entered, time zone off set is required.
9		CQ	X	[0..0]		Collection Volume		Deprecated as of *HL7 Version 2.5.* Not used.

Example Data:

OBR|1|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|||20130215160000.0000-0500|||||||||
12345^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD|^WPN^PH^^1^955^555^7723^041|||||20130220143000.0000-0500|||F

OBR – Observation Request Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
10		XCN	X	[0..0]		Collector Identifier		Not used.
11	1..1	ID	X	[0..0]	0065	Specimen Action Code		Not used.
12		CWE	X	[0..0]		Danger Code		Not used.
13		ST	X	[0..0]		Relevant Clinical Info.		Not used.
14		TS	X	[0..0]		Spec. Received Date/Time		Deprecated as of *HL7 Version 2.5.* Not used. See SPM segment.
15		SPS	X	[0..0]		Specimen Source		Deprecated as of *HL7 Version 2.5.* Not used. See SPM segment.
16		XCN	R	[1..1]		Ordering Provider	Value from ORC-12	This field must contain the same value as ORC-12.
17		XTN	R	[1..1]		Order Callback Phone Number	Value from ORC-14	This field must contain the same value as ORC-14.
18	1..199=	ST	X	[0..0]		Placer Field 1		Not used.
19	1..199=	ST	X	[0..0]		Placer Field 2		Not used.
20	1..199=	ST	X	[0..0]		Filler Field 1		Not used.
21	1..199=	ST	X	[0..0]		Filler Field 2		Not used.
22		TS	R	[1..1]		Results/ Status Update Date/Time	YYYYMMDDHHMM [SS[.SSSS]] +/- ZZZZ	Status that applies to the entire report. A subsequent message with the same Filler Order Number and a different value in this field implies a status update. Minimum granularity is to the minute. Time zone off set is required.
23		MOC	X	[0..0]		Charge To Practice		Not used.

Example Data:

OBR|1|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|||20130215160000.0000-0500|||||||||12345^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD|^WPN^PH^^1^955^555^7723^041|||||20130220143000.0000-0500|||F

OBR – Observation Request Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
24	2..3	ID	X	[0..0]	0074	Dx Service Sector ID		Not used.
25	1..1	ID	R	[1..1]	V2 RSVS	Result Status	Status Indicator	**P** = Preliminary **C** = Correction to results **F** = Final results
26		PRL	C	[0..1]		Parent Result	Parent OBX-3 **^** Parent OBX-4 **^** Parent OBX-5	Required if linking child sensitivities to the parent culture. Populate components using data structure from the respective parent OBX fields.
27		TQ	X	[0..0]		Quantity/ Timing		Deprecated as of *HL7 Version 2.5.* Not used.
28		XCN	X	[0..0]		Result Copies To		Not used.
29		EIP	C	[0..1]		Parent	Parent ORC-2 **^** Parent ORC-3	Required if linking a susceptibility result to the parent culture. Populate components using data structure from the respective ORC fields.
30	4..4	ID	X	[0..0]		Transportation Mode		Not used.
31		CWE	RE	[0..15]		Reason for Study	Reason for Study Code **^** Description **^** Coding System (TBL# 0396) **^** Alternate Code **^** Alternate Text **^** Alt. Coding Sys. (TBL# 0396) **^** Coding System Version ID **^** Alt. Coding Sys. Ver. ID **^** Original Text	If populated, the first three components and the Coding System Version ID are required. SNOMED CT, ICD-9 or ICD-10 codes are used as the main coding system.
32		NDL	X	[0..0]		Principal Result Interpreter		Not used.
33		NDL	X	[0..0]		Assistant Result Interpreter		Not used.
34		NDL	X	[0..0]		Technician		Not used.
35		NDL	X	[0..0]		Transcriptionist		Not used.
36		TS	X	[0..0]		Scheduled Date/Time		Not used.

Example Data:

OBR|1|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|||20130215160000.0000-0500|||||||||
12345^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD|^WPN^PH^^1^955^555^7723^041|||||20130220143000.0000-0500|||F

OBR – Observation Request Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
37	1..16=	NM	X	[0..0]		No. of Sample Containers		Not used.
38		CWE	X	[0..0]		Transport Logistics		Not used.
39		CWE	X	[0..0]		Collector's Comment		Not used.
40		CWE	X	[0..0]		Transport Arrangement		Not used.
41	1..1	ID	X	[0..0]		Transport Arranged		Not used.
42	1..1	ID	X	[0..0]		Escort Required		Not used.
43		CWE	X	[0..0]		Pat. Transport Comment		Not used.
44		CWE	X	[0..0]	0088	Procedure Code		Not used.
45		CWE	X	[0..0]	0340	Procedure Code Modifier		Not used.
46		CWE	X	[0..0]	0411	Placer Service Supplemental		Not used.
47		CWE	X	[0..0]	0411	Filler Service Supplemental		Not used.
48		CWE	X	[0..0]	0476	Duplicate Med. Procedure Rsn.		Not used.
49		IS	X	[0..0]	0507	Result Handling		Not used.
50		CWE	X	[0..0]		Parent Universal Svc ID		Not used.

Example Data:

OBR|1|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|||20130215160000.0000-0500|||||||||12345^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD|^WPN^PH^^1^955^555^7723^041|||||20130220143000.0000-0500|||F

OBX – OBSERVATION/RESULT SEGMENT

This segment contains information regarding a single observation related to a single test (OBR). For example, the OBX segment identifies the specific type of observation, observation result, time of observation, etc.

OBX – Observation/Result Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1..4	SI	R	[1..1]		Set ID – OBX	Set ID	Within each Order Observation group, this number is **1** for the first occurrence of the segment; **2** for the second, **3** for the third, etc.
2	2..3	ID	R	[1..1]	0125	Value Type	Data Type (TBL# 0125)	Identifies the data type used for OBX-5. Allowed data types are **CWE**, **NM**, **SN** or **ST**. See page 40 for instructions and examples.
3		CWE	R	[1..1]	LN	Observation Identifier	Test Code (LOINC) **^** Description **^LN^** Alternate Code **^** Alternate Text **^** Alt. Coding Sys. (TBL# 0396) **^** LOINC Ver. ID **^** Alt. Coding Sys. Ver. ID **^** Original Text	Identifies the test performed. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
4	1..20=	ST	C	[0..1]		Observation Sub-ID	Sub-ID	Required if there is more than one OBX with an identical OBX-3 (Observation Identifier) within the Order Observation group. Sub-IDs are numbered in sequence, beginning at **1**.
5		CWE --- NM --- SN --- ST	R	[1..1]	SCT	Observation Value	Concept Code (SNOMED CT) **^** Description **^SCT^** Alternate Code **^** Alternate Text **^** Alternate Coding System (TBL# 0396) **^** SNOMED CT Ver. ID **^** Alt. Coding Sys. Ver. ID **^** Original Text --- Numeric Value --- Comparator **^** Numeric Value **^** Separator **^** Numeric Value --- String Value	For **CWE**, the first three components and the SNOMED CT Version ID are required. For **SN**, the following comparators and separators can be used to supplement the numeric results: Comparators: < > <= >= <> Separators: – + / . : See page 40 for instructions and examples. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.

Example Data:

OBX|1|CWE|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|1|407479009^Influenza A virus^SCT^305^Influenza A^L^20130131^2.0|||A^Abnormal^HL70078^^^^2.5.1|||F|||
20130215160000.0000-0500|||||20130219090000.0000-0500|||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

OBX – Observation/Result Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
6		CWE	C	[0..1]	UCUM	Units	Units of Measure Code (UCUM) **^** Description **^UCUM^** Alternate Code **^** Alternate Text **^** Alt. Coding Sys. (TBL# 0396) **^** UCUM Ver. ID **^** Alt. Coding Sys. Ver. ID **^** Original Text	Required if OBX-2 is "NM." If populated, the first three components and the UCUM Version ID are required. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
7	1..60=	ST	RE	[0..1]		Reference Range	Reference range	Interpretation range for the value reported in OBX-5. It should provide enough information to understand the abnormal flags in OBX-8. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
8	1..20=	CWE	RE	[0..1]	0078	Abnormal Flags	Abnormal Flag Code (TBL# 0078) **^** Description **^HL70078^** Alternate Code **^** Alternate Text **^** Alt. Coding System (TBL# 0396) **^2.5.1^** Alt. Coding System Version ID **^** Original Text	Indicator for the normalcy of the result found in OBX-5. If populated, the first three components and the Version ID (2.5.1) are required.
9	1..5#	NM	X	[0..0]		Probability		Not used.
10	1..2	ID	X	[0..0]	0080	Nature of Abnormal Test		Not used.
11	1..1	ID	R	[1..1]	0085	Observation Result Status	Result Status (TBL# 0085)	**P** = Preliminary **C** = Correction to results **F** = Final results
12		TS	X	[0..0]		Effective Date of Ref. Range		Not used.
13	20=	ST	X	[0..0]		User-Defined Access Checks		Not used.
14		TS	R	[1..1]		Date/Time of Spec Collection	Value from OBR-7	This field must contain the same value as OBR-7.
15		CWE	X	[0..0]		Producer's Reference		Not used.

Example Data:

OBX|1|CWE|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|1|407479009^Influenza A virus^SCT^305^Influenza A^L^20130131^2.0|||A^Abnormal^HL70078^^^^2.5.1|||F|||
20130215160000.0000-0500|||||20130219090000.0000-0500|||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

OBX – Observation/Result Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
16		XCN	X	[0..0]		Responsible Observer		Not used.
17		CWE	X	[0..0]		Observation Method		Not used.
18		EI	X	[0..0]		Equipment Instance ID		Not used.
19		TS	R	[1..1]		Date/Time of Analysis	YYYYMMDD [HH[MM[SS[.SSSS]]]] +/- ZZZZ	Date and time the testing was performed. Minimum granularity is to the day. If time is entered, time zone off set is required. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
20			X	[0..0]				Reserved for harmonization with *Version 2.6.* Not used.
21			X	[0..0]				Reserved for harmonization with *Version 2.6.* Not used.
22			X	[0..0]				Reserved for harmonization with *Version 2.6.* Not used.
23		XON	R	[1..1]		Performing Organization Name	Organization Name **^** Name Type (TBL# 0204) **^^^^** Assigning Authority Name **&** OID **&ISO^** Organization Identifier Type (TBL# 0203) **^** Assigning Facility Name **&** OID **&ISO^^** Organization Identifier	Identifies the lab that produced the test result in this OBX segment. If Organization Identifier is present, the Assigning Authority and the Organization Identifier Type are required. For labs, CLIA ID is allowed as an alternative to the OID. If a subcomponent is populated, all remaining subcomponents within the component must also be populated. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.

Example Data:

OBX|1|CWE|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|1|407479009^Influenza A virus^SCT^305^Influenza A^L^20130131^2.0|||A^Abnormal^HL70078^^^^2.5.1|||F|||
20130215160000.0000-0500|||||20130219090000.0000-0500|||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

OBX – Observation/Result Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
24		XAD	R	[1..1]		Performing Organization Address	Street Address ^ Other Designation ^ City ^ State/Province ^ ZIP/Postal Code ^ Country ^ Address Type (TBL# 0190)	Street Address, City, State and ZIP are required at minimum. Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
25		XCN	R	[1..1]		Performing Organization Med. Director	Provider Identifier ^ Last Name ^ First Name ^ Middle Name/Initial ^ Suffix ^ Prefix ^^^ Assigning Authority & OID &ISO^ Name Type (TBL# 0200) ^^^ Identifier Type (TBL# 0203) ^^^^^^^ Professional Suffix (TBL# 0360)	Reporting of the clinical laboratory director's name is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.

Example Data:

OBX|1|CWE|6604-3^Influenza virus identified:Prid:Pt:XXX:Nom:Organism specific culture^LN^269^Influenza Culture^L^2.42^2.0^Influenza virus identified in Unspecified specimen by Organism specific culture|1|407479009^Influenza A virus^SCT^305^Influenza A^L^20130131^2.0|||A^Abnormal^HL70078^^^^2.5.1|||F|||20130215160000.0000-0500|||||20130219090000.0000-0500|||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Note: See pages 40 and 41 for instructions and examples on how to populate this segment appropriately in various circumstances.

NTE – NOTES AND COMMENTS SEGMENT

This segment is used to convey additional comments. It is not intended for automatic processing; rather, this segment is primarily intended for human use.

NTE – Notes and Comments Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1		SI	R	[1..1]		Set ID – NTE	Set ID	Within each Observation group, this number is **1** for the first occurrence of the segment; **2** for the second, **3** for the third, etc.
2	1..1	ID	RE	[0..1]	0105	Source of Comment	Source of Comment (TBL# 0105)	**L** = Ancillary (filler) department **P** = Orderer (placer) **O** = Other system
3		FT	R	[1..1]		Comment	Relevant information in text	Comment goes here. It can be a very long comment.
4		CWE	RE	[0..1]	0364	Comment Type	Comment Type (TBL# 0364) **^** Description **^HL70364^** Alternate Code **^** Alternate Text **^** Alternate Coding System (TBL# 0396) **^2.5.1^** Alt. Coding Sys. Ver. ID **^** Original Text	If populated, the first three components and the Version ID (2.5.1) are required.

Example Data:

NTE|1|L|This test was performed as a result of the patient presenting symptoms related to … … … … Further investigation is required for clear assessment of … … … |
RE^Remark^HL70364^^^^2.5.1

SPM – SPECIMEN SEGMENT

This segment describes the characteristics of a single sample, including the type, source, collector of the specimen and additional basic information.

SPM – Specimen Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1..4	SI	R	[1..1]		Set ID – SPM	**1**	
2		EIP	R	[1..1]		Specimen ID	Placer Specimen ID **&** Placer Name **&** Placer OID **&ISO^** Filler Specimen ID **&** Filler Name **&** Filler OID **&ISO**	Specimen identifiers may be different than the filler/placer order numbers. At minimum, the filler components are required. For labs, CLIA ID is allowed as an alternative to the OID. If a subcomponent is populated, all remaining subcomponents within the component must also be populated.
3		EIP	X	[0..0]		Specimen Parent IDs		Not used.
4		CWE	R	[1..1]	SCT	Specimen Type	Specimen Code (SNOMED CT) **^** Description **^SCT^** Alternate Code **^** Alternate Text **^** Alt. Coding Sys. (TBL# 0396) **^** Version ID **^** Alt. Sys. Ver. ID **^** Original Text	Reporting of this field is required under the Arizona Administrative Code R9-6-204, *Clinical Laboratory Director Reporting Requirements*.
5		CWE	X	[0..0]		Specimen Type Modifier		Not used.
6		CWE	X	[0..0]	0371	Specimen Additives		Not used.
7		CWE	X	[0..0]		Collection Method		Not used.
8		CWE	RE	[0..1]	SCT	Specimen Source Site	Specimen Source Site Code (SNOMED CT) **^** Description **^SCT^** Alternate Code **^** Alternate Text **^** Alt. Coding Sys. (TBL# 0396) **^** Version ID **^** Alt. Sys. Ver. ID **^** Original Text	The first three components and the SNOMED CT Version ID are required at minimum.
9		CWE	X	[0..0]		Spec. Source Site Modifier		Not used.

Example Data:

SPM|1|76543&MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO^87654&MPI LabCo&6.78.901.2.345678.90.1.2&ISO||258500001^Nasopharyngeal Swab^SCT^482^NP Swab ^L^20130131^2.0||||71836000^Nasopharyngeal structure^SCT^584^NP structure^L^20130131^2.0|||||||||20130215160000.0000-0500|20130215180000.0000-0500

SPM – Specimen Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
10		CWE	X	[0..0]	0543	Specimen Collection Site		Not used.
11		CWE	X	[0..0]	0369	Specimen Role		Not used.
12		CQ	X	[0..0]	UCUM	Collection Amount		Not used.
13	1..6=	NM	X	[0..0]		Grouped Spec. Count		Not used.
14		ST	X	[0..0]		Specimen Description		Not used.
15		CWE	X	[0..0]	0376	Specimen Handling Code		Not used.
16		CWE	X	[0..0]	0489	Specimen Risk Code		Not used.
17		DR	R	[1..1]		Specimen Collection Date/Time	Value from OBR-7 **^** Value from OBR-8	Values from OBR-7 and OBR-8 must be populated in the respective components.
18		TS	R	[1..1]		Specimen Received Date/Time	YYYYMMDD [HH[MM[SS[.SSSS]]]] +/- ZZZZ	Minimum granularity is to the day. Populate to the lowest possible granularity. If time is entered, time zone off set is required.
19		TS	X	[0..0]		Specimen Expiration Date/Time		Not used.
20	1..1	ID	X	[0..0]	0136	Specimen Availability		Not used.
21		CWE	X	[0..0]	0490	Specimen Reject Reason		Not used.
22		CWE	X	[0..0]	0491	Specimen Quality		Not used.
23		CWE	X	[0..0]	0492	Specimen Appropriate-ness		Not used.

Example Data:

SPM|1|76543&MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO^87654&MPI LabCo&6.78.901.2.345678.90.1.2&ISO||258500001^Nasopharyngeal Swab^SCT^482^NP Swab ^L^20130131^2.0||||71836000^Nasopharyngeal structure^SCT^584^NP structure^L^20130131^2.0|||||||||20130215160000.0000-0500|20130215180000.0000-0500

SPM – Specimen Segment (Continued)								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
24		CWE	X	[0..0]	0493	Specimen Condition		Not used.
25		CQ	X	[0..0]	UCUM	Spec. Current Quantity		Not used.
26	1..4=	NM	X	[0..0]		No. of Spec. Containers		Not used.
27		CWE	X	[0..0]		Container Type		Not used.
28		CWE	X	[0..0]	0544	Container Condition		Not used.
29		CWE	X	[0..0]	0494	Specimen Child Role		Not used.

Example Data:

SPM|1|76543&MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO^87654&MPI LabCo&6.78.901.2.345678.90.1.2&ISO||258500001^Nasopharyngeal Swab^SCT^482^NP Swab ^L^20130131^2.0||||71836000^Nasopharyngeal structure^SCT^584^NP structure^L^20130131^2.0|||||||||20130215160000.0000-0500|20130215180000.0000-0500

BTS – BATCH TRAILER SEGMENT

This segment defines the end of a batch (group of messages).

BTS – Batch Trailer Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	4	NM	R	[1..1]		Batch Message Count	Numeric Value	Total number of messages contained in the batch. Up to 10,000 messages are allowed in a single batch in this implementation guide.
2	80	ST	X	[0..0]		Batch Comment		Not used.
3	100	NM	X	[0..0]		Batch Totals		Not used.

Example Data:

BTS|37

FTS – FILE TRAILER SEGMENT

This segment defines the end of a file (group of batches).

FTS – File Trailer Segment								
SEQ	**LEN**	**DT**	**Usage**	**Cardinality**	**TBL#**	**Element Name**	**Required/Recommended/Literal Value**	**Description/Comments**
1	1..10=	NM	R	[1..1]		File Batch Count	**1**	Total number of batches contained in the file. One batch is allowed in a single file in this implementation guide.
2	1..80#	ST	X	[0..0]		File Trailer Comment		Not used.

Example Data:

FTS|1

HOW TO DESCRIBE TEST RESULTS

The following section demonstrates the appropriate selection of data types in OBX-2 (Value Type) for accurately describing an observation result in OBX-5 (Observation Value). Data type selection depends on the type of test performed on the specimen, which is described in OBX-3 (Observation Identifier) using the Logical Observation Identifier Names and Codes (LOINC). In other words, the type of test identified by the LOINC populated in OBX-3 determines what data type may be used for OBX-2 and OBX-5. The examples below illustrate scenarios where the four data types that are supported in this guide—CWE, NM, SN and ST—may be used to describe various types of observation results.

Scenario I ***LOINC in OBX-3 represents a non-quantitative test that is specific to one organism.***

Data Type ST (String) or CWE (Coded with Exceptions)

Required OBX-5 may contain text values, e.g. positive, detected, etc. However, many of these values are available as coded values in the Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT). Hence, the use of CWE with SNOMED CT is preferred. OBX-8 must indicate the normalcy of the result as needed.

Example 1

OBX|1|ST|6528-4^Rabies virus Ag:ACnc:Pt:Tiss:Ord:IF^LN^652^Rabies virus Ag^L^2.42^2^Rabies virus Ag [Presence] in Tissue by Immunofluorescence|1|Detected|||A^Abnormal^HL70078^^^^2.5.1|||F|||20130215160000.0000-0500|||||20130219090000.0000-0500||||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Example 2

OBX|1|CWE|6528-4^Rabies virus Ag:ACnc:Pt:Tiss:Ord:IF^LN^652^Rabies virus Ag^L^2.42^2.0^Rabies virus Ag [Presence] in Tissue by Immunofluorescence|1|260373001^Detected^SCT^^^^20130131|||A^Abnormal^HL70078^^^^2.5.1|||F|||20130215160000.0000-0500|||||20130219090000.0000-0500||||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Scenario II ***LOINC in OBX-3 represents a non-quantitative test that is NOT specific to one organism.***

Data Type CWE (Coded with Exceptions)

Required OBX-5 must contain a SNOMED CT code that is specific to an organism identified by the test. OBX-8 must indicate the normalcy of the result as needed.

Example 1

OBX|1|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^425^Bacteria Stl Cult^L^2.42^2.0^Bacteria identified in Stool by Culture|1|66543000^Campylobacter jejuni^SCT^9543^C jejuni^L^20130131^2.0|||A^Abnormal^HL70078^^^^2.5.1|||F|||20130215160000.0000-0500|||||20130219090000.0000-0500||||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Example 2

OBX|1|CWE|580-1^Fungus identified:Prid:Pt:XXX:Nom:Culture^LN^553^Fungal Culture^L^2.42^2.0^Fungus identified in Unspecified specimen by Culture|1|115996006^Coccidioides species^SCT^2157^Cocci species^L^20130131^2.0|||A^Abnormal^HL70078^^^^2.5.1|||F|||20130215160000.0000-0500|||||20130219090000.0000-0500||||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Scenario III ***LOINC in OBX-3 represents a quantitative test that is specific to one organism.***

Data Type NM (Numeric)

Required OBX-5 must contain a numeric value. OBX-6 must contain a measurement unit code. OBX-7 must contain a reference range for the test. OBX-8 must indicate the normalcy of the result as needed.

Example 1

OBX|1|NM|10368-9^Lead:MCnc:Pt:BldC:Qn:^LN^140^Lead BldC-mCnc^L^2.42^2.0^Lead [Mass/volume] in Capillary blood|1|50|ug/dL^micro-gram per deci-liter^UCUM^^^^1.8|<10 ug/dL|H^Above high normal^HL70078^^^^2.5.1|||F|||20130216090000.0000-0500|||||20130219090000.0000-0500|||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Example 2

OBX|1|NM|17016-7^Influenza virus B Ab.IgM:ACnc:Pt:Ser:Qn:^LN^640^Influenza B Ab IgM^L^2.42^2.0^Influenza virus B IgM Ab [Units/volume] in Serum|1|1.5|{index_val}^Index Value^UCUM^^^^1.8|<=0.89| A^Abnormal^HL70078^^^^2.5.1|||F|||20130216090000.0000-0500|||||20130219090000.0000-0500||||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Scenario IV ***LOINC in OBX-3 represents a quantitative test that is specific to one organism. The result is expressed in intervals, ratios, inequalities or categorical results.***

Data Type SN (Structured Numeric)

Required OBX-5 must contain a numeric value expressed with comparators or separators as appropriate. OBX-6 must contain a measurement unit code. OBX-7 must contain a reference range for the test as needed. OBX-8 must indicate the normalcy of the result as needed.

Example 1

OBX|1|SN|5198-7^Hepatitis C virus Ab:ACnc:Pt:Ser:Qn:EIA^LN^798^HCV EIA^L^2.42^2.0^Hepatitis C Virus Ab [Units/volume] in Serum by Immunoassay|1|>^11.0|{s_co_ratio}^signal to cutoff ratio^UCUM^^^^1.8|0.0-0.9|POS^Positive^HL70078^^^^2.5.1|||F|||20130215160000.0000-0500|||||20130219090000.0000-0500|||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

Example 2

OBX|1|SN|31147-2^Reagin Ab:Titr:Pt:Ser:Qn:RPR^LN^0178^Syphilis (Treponema pallidum) RPR Titer^L^2.42^2.0^Reagin Ab [Titer] in Serum by RPR|1|^1^:^32|{titer}^titer^UCUM^^^^1.8||N^Within Range^HL70078^^^^2.5.1|||F|||20130215160000.0000-0500|||||20130219090000.0000-0500||||MPI LabCo|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|^Doe^Jonathan

HOW TO DESCRIBE SUSCEPTIBILITY RESULTS

The following section describes the appropriate method of describing antimicrobial susceptibility results in an HL7 message. The connection of the culture to the susceptibilities can be considered a "parent-child" relationship, in which the culture is the parent result and the susceptibilities are the child results. Since the ORU message structure allows for multiple occurrences of the Order Observation group, an HL7 message may contain multiple child Order Observation groups that are associated with a parent Order Observation group. For this linkage to work properly, the OBR segment in each child group must contain a reference pointer that links to the OBR and OBX segments in the parent group. This reference pointer is established by populating OBR-26 (Parent Result) and OBR-29 (Parent Number) in the child OBR segment. The example below demonstrates how susceptibility results are described throughout a message using the parent-child relationship.

Parent Order Observation group

OBR|1|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.42|||20130215160000.0000-0500|||||||||12345^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD|^WPN^PH^^1^955^555^7723^041|||||20130220143000.0000-0500|||F

OBX|1|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.42|1|66543000^Campylobacter jejuni^SCT^^^^20130131|||A^Abnormal^HL70078…

OBX|2|SN|564-5^Colony count:Num:Pt:XXX:Qn:Vc^LN^^^^2.42|1|^10000^-^90000|{count}^count^UCUM^^^^1.8|||||F…

OBX|3|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.42|2|302620005^Salmonella group B phase 1 a-e^SCT^^^^20130131|||A^Abnormal^HL70078…

OBX|4|SN|564-5^Colony count:Num:Pt:XXX:Qn:Vc^LN^^^^2.42|2|>^10000|{count}^count^UCUM^^^^1.8|||||F…

First child Order Observation group within the same message

OBR|2|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|50545-3^Bacterial susceptibility panel:-:Pt:Isolate:OrdQn:MIC^LN^^^^2.42|||20130215160000.0000-0500|||||||||12345^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD|^WPN^PH^^1^955^555^7723^041|||||20130220143000.0000-0500|||F|625-4&Bacteria identified:Prid:Pt:Stool:Nom:Culture&LN&&&&2.42^1^66543000&Campylobacter jejuni&SCT&&&&20130131|||1234&MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO^56789&MPI LabCo&6.78.901.2.345678.90.1.2&ISO

OBX|1|SN|6979-9^Ampicillin:Susc:Pt:Isolate:OrdQn:Gradient Strip^LN^^^^2.42|1|<^0.06|ug/mL^MicroGrams Per MilliLiter^UCUM^^^^1.8||S^Susceptible^HL70078…

OBX|2|SN|7016-9^Gentamicin:Susc:Pt:Isolate:OrdQn:Gradient Strip^LN^^^^2.42|1|^0.05|ug/mL^MicroGrams Per MilliLiter^UCUM^^^^1.8||S^Susceptible^HL70078…

OBX|3|SN|7002-9^Ciprofloxacin:Susc:Pt:Isolate:OrdQn:Gradient Strip^LN^^^^2.42|1|^0.05|ug/mL^MicroGrams Per MilliLiter^UCUM^^^^1.8||S^Susceptible^HL70078…

Second child Order Observation group within the same message

OBR|3|1234^MPI Ann Arbor^3.45.678.9.012345.67.8.9^ISO|56789^MPI LabCo^6.78.901.2.345678.90.1.2^ISO|50545-3^Bacterial susceptibility panel:-:Pt:Isolate:OrdQn:MIC^LN^^^^2.42|||20130215160000.0000-0500|||||||||12345^Admit^Alan^A^III^Dr^^^CMS&2.16.840.1.113883.3.249&ISO^L^^^NPI^^^^^^^^MD|^WPN^PH^^1^955^555^7723^041|||||20130220143000.0000-0500|||F|625-4&Bacteria identified:Prid:Pt:Stool:Nom:Culture&LN&&&&2.42^2^302620005&Salmonella group B phase 1 a-e&SCT&&&&20130131|||1234&MPI Ann Arbor&3.45.678.9.012345.67.8.9&ISO^56789&MPI LabCo&6.78.901.2.345678.90.1.2&ISO

OBX|1|SN|6979-9^Ampicillin:Susc:Pt:Isolate:OrdQn:Gradient Strip^LN^^^^2.42|1|<^0.06|ug/mL^MicroGrams Per MilliLiter^UCUM^^^^1.8||S^Susceptible^HL70078…

OBX|2|SN|7016-9^Gentamicin:Susc:Pt:Isolate:OrdQn:Gradient Strip^LN^^^^2.42|1|^0.05|ug/mL^MicroGrams Per MilliLiter^UCUM^^^^1.8||S^Susceptible^HL70078…

OBX|3|SN|7002-9^Ciprofloxacin:Susc:Pt:Isolate:OrdQn:Gradient Strip^LN^^^^2.42|1|^0.05|ug/mL^MicroGrams Per MilliLiter^UCUM^^^^1.8||S^Susceptible^HL70078…

TOOLS AND RESOURCES

ADHS Meaningful Use Website http://www.azdhs.gov/meaningful-use
Contains general information on:

- *Meaningful Use objective and measure for ELR to public health*
- *Message and vocabulary standards (HL7 Implementation Guide, LOINC, SNOMED CT)*
- *ELR implementation and Meaningful Use attestation steps for hospitals*
- *Arizona laboratory and healthcare provider reportable conditions*
- *Tools for vocabulary mapping and message validation*

Health Level Seven International Website http://www.hl7.org
Official HL7 website containing news and resources related to HL7

Logical Observation Identifiers Names and Codes (LOINC) Search Engine http://search.loinc.org
Browser engine for Logical Observation Identifiers Names and Codes (LOINC)

Veterinary Terminology Services Laboratory http://vtsl.vetmed.vt.edu
Terminology Browser for Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT)

CDC PHIN Vocabulary Access and Distribution System (VADS) https://phinvads.cdc.gov/vads/SearchVocab.action
Vocabulary tool containing coded values for:

- *HL7 and user-defined tables*
- *LOINC*
- *SNOMED CT*

CDC PHIN Message Quality Framework (MQF)
https://phinmqf.cdc.gov/ValidateMessages.aspx?Act=1&ProjectName=Meaningful Use-Electronic Laboratory Reporting Receiver Profile&ProjCode=115
HL7 Version 2.5.1 ORU Message Receiver Profile Validation Tool released by CDC

National Institute for Standards and Technology (NIST) HL7 V2.5.1 ELR Validation Tool – Meaningful Use 2014 Edition
http://hl7v2-elr-testing.nist.gov/mu-elr
HL7 Version 2.5.1 ORU Message Receiver Profile Validation Tool released by NIST

GLOSSARY

ADHS	Arizona Department of Health Services
Assigning Authority	Identifies the system, application or organization that assigns the identifier.
Assigning Facility	Identifies the place where the identifier is assigned.
Batch	A group of messages.
Cardinality	Minimum and maximum number of times the element may appear.
CDC	Centers for Disease Control and Prevention
CLIA	Clinical Laboratory Improvement Amendments
Component	Data element within a field.
Component Separator	Separates adjacent components within a field.
Composite	A data type made up of a series of components that are themselves assigned a data type.
Data Type (DT)	The basic building block used to construct or restrict the contents of a data field.
EHR	Electronic Health Record
ELR	Electronic Laboratory Reporting
ELR2PH	HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1
Escape Character	Used to signal certain special characteristics of portions of the text field.
Field	A string of characters.
Field Separator	Separates two adjacent data fields within a segment. It also separates the segment ID from the first data field in each segment.
File	Contains one or more batches.
HL7	An application protocol for electronic data exchange in health care environments.
ISO	International Organization for Standardization
Length (LEN)	The number of characters that one occurrence of the data field or component may occupy.
LIS	Laboratory Information System
LOINC (LN)	Logical Observation Identifiers Names and Codes. A universal code system for identifying laboratory and clinical observations.
Message	An atomic unit of data comprised of a group of segments in a defined sequence.
NIST Validation Tool	A message validation tool released by the National Institute for Standards and Technology to help Meaningful Use candidates prepare for certification.
OID	Object Identifier. A globally unique ISO identifier.
ORU	An HL7 message type that is specific to an unsolicited transmission of an observation.
PHIN	Public Health Information Network
PHIN MQF	PHIN Message Quality Framework. An HL7 message validation tool released by the CDC.
PHIN VADS	PHIN Vocabulary Access and Distribution System. A vocabulary server that allows public health partners to search, browse and download vocabularies.
Primitive	A data type that consists of a series of characters.
Repetition Separator	Separates multiple occurrences of a field where allowed.
Segment	A logical grouping of data fields.
Segment Group	A logical unit of two or more segments.
Segment Terminator	Terminates a segment record. This value cannot be changed by implementers.
Sequence (SEQ)	Ordinal position of the field within the segment.
SNOMED CT (SCT)	Systematized Nomenclature of Medicine Clinical Terms
Subcomponent	Data element within a component.
Subcomponent Separator	Separates adjacent subcomponents within a component.
Usage	Indicates whether the message element is required, required but can be empty, conditional, or not used.
UCUM	Unified Code for Units of Measure

For additional information, please contact the Electronic Disease Surveillance Program at meaningfuluse@azdhs.gov.

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