Public Health Informatics Data Exchange (PHID) Electronic Laboratory Reporting (ELR) HL7 ORU Technical Implementation Specification

Version 2.3
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TEXAS Health and Human Services | Texas Department of State Health Services

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Revision

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Scope

This document provides the technical requirements and specifications for facilities in Texas to use as Comments for reporting laboratory tests and results electronically to the National Electronic Disease Surveillance System (NEDSS) in Texas, which is managed by the Texas Department of State Health Services (DSHS). The Texas ELR Implementation Guide is a constraint of HL*7 Version 2.5.1 Implementation Guide: Electronic* Laboratory *Reporting to Public Health (US Realm), Release 1.*

Purpose

Please note that this technical specification (v2.3) is not an alternative to the HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1 (US Realm) published by HL7. It is strongly recommended that this document be read in full with reference to the HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health, Release 1 (US Realm). Refer to both the implementation guides before starting implementation of ELR to identify the procedures required by HL7 2.5.1 standard and Texas National Electronic Disease Surveillance System (NEDSS).

Electronic Laboratory Reporting

Electronic Laboratory Reporting (ELR) allows laboratories to report test results for reportable diseases through an automated and secure process to the statewide disease surveillance system. Laboratory data are sent in a standard HL7 2.5.1 format electronically through a secure interface.

Detailed within are processes to obtain authorization for communicating ELR to the DSHS Public health informatics and Data exchange (PHIDE). In order to meet the DSHS HL7 requirements, the messages must be in HL7 2.5.1. This document serves to facilitate the communication of data in a standard format for the consumption of DSHS NEDSS and its associated downstream systems only. It is assumed that the reader has background knowledge of, and access to the version of HL7 specifications, on which they wish to build a message. DSHS Public health informatics and Data Exchange Group (PHIDEG) may provide some comments with regard to base HL7 specifications but cannot be relied upon as the sole authority for which all decisions are based. Supported HL7 message segments for ELR Messages.

Health Level Seven (HL7) Standard

This section contains definitions of basic HL7 terminology, conventions, and table attributes.

BASIC HL7 TERMS

Term	Definition
Message	A message is the entire unit of data transferred between systems in a single transmission. It is a series of segments in a defined sequence, with a message type and a trigger event.
Segment	A segment is a logical grouping of data fields. Segments within a defined message may be required or optional and may occur only once or may be allowed to repeat. Each segment is named and is identified by a segment ID, a unique 3-character code
Field	A field is a string of characters. Each field has an element name and is identified by the segment it is in and its sequence within the segment. Usage and cardinality requirements are defined in the Segment Definitions.
Component	A component is one of a logical grouping of items that comprise the contents of a coded or composite field. Within a field having several components, not all components are necessarily required to be populated.
Data Type	A data type restricts the contents and format of the data field. Data types are given a 2- or 3- letter code. Some data types are coded or composite types with several components. The applicable HL7 data type is listed in each field definition.
Delimiters	The delimiter values are given in MSH-1 and MSH-2 and are used throughout the message. The delimiters supported by SPHLELR and MOELR are: | Field Separator ^ Component Separator & Sub-Component Separator ~ Repetition Separator \ Escape Character

Public Health Laboratory Messaging – ORU^R01 – Unsolicited Observation Results

Segment	Name	Description
MSH	Message Header	Includes information on message delimiters, sender, receiver, message type, and time stamp of the message
{SFT}	Software Segment	A minimum of a single SFT segment is required by the original sending facility. Oregon ELR ignores multiple SFT segments.
PID	Patient Identification	Demographic data on the subject of the test (i.e., the patient)
[{NK1}]	Next of Kin/Associated Party	Used to document next of kin or associated party (employer, guardian, etc.). Required when reporting lead results for children.
[PV1]	Patient Visit	Basic inpatient or outpatient encounter information.
{ [ORC	Order Common	Information about the order including who placed it and when it was placed, etc. This segment is only required for the first order observation group.
OBR	Observation Request	Information about the test being performed; linked to subsequent results
[{NTE}]	Notes regarding the OBR	
{ OBX	Observation related to OBR	Information regarding a single result
[{NTE}]	Notes regarding the OBX	
[{FT1}]	Financial transaction information related to the OBR	Contains the detail data necessary to post charges, payments, adjustments, etc. to patient accounting records.
SPM	Specimen information related to the OBR	Characteristics of a single sample – specimen number for a single sample, specimen type, collection date, collection site, collection location, who collected the specimen

ELR Segment Attributes

	Segment Attributes
Attribute	**Definition**
Sequence (Seq)	Sequence of the elements as they are numbered in the HL7 segment.
Element Name	Descriptive name of a field.
Description	Explanation of the use of the field, component or sub-component.
Value Set	Indicates where valid values for coded fields may be found.
Length (Len)	Maximum length of the field.
Data Type (DT)	A data type restricts the content and format of the data field. Data types are given a 2- or 3- letter code. Some data types are coded or composite types with several components. The applicable HL7 data type is listed in each field definition.
Usage	This indicates whether a field is required, required when the information is available, optional or conditional as specified in the field description. The designations are: R Required. RE Required if available, but may be empty. O Optional. C(a/b) Conditional. The usage code has an associated condition predicate true. If the condition predicate associated with the element is true, follow the rules for ***a*** which shall one of "R", "RE", "O" or X": • If the condition predicate associated with the element is false, follow the rules for ***b*** which shall one of "R", "RE", "O" or X". • A and b can be the same X Not supported. Senders must not populate. Receivers may ignore the element if it is sent, or may raise an error if field is present.
Cardinality	Defines the minimum and maximum number of times the field may appear in this segment. [0..1] Field may be omitted and can have, at most, one occurrence. [0..*] Field may be omitted or repeat an unlimited number of times. [1..1] Field must have exactly one occurrence. 1..*] Field must appear at least once, and may repeat an unlimited number of times. [m..n] Field must appear at least *m*, and at most, *n* times.

MSH – Message Segment Header

The MSH segment contains information about how to parse and process the message.

MSH – Message Header Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
1	ST	R	Field Separator	Literal value: **|**
2	ST	R	Encoding Characters	Literal value: **^~\&**
3	HD	R	Sending Application	Name^**Application OID**^ISO
3.1	IS	RE	Namespace ID	Null values are not allowed.
3.2	ST	R	Universal ID	Only OID is allowed
3.3	ID	R	Universal ID Type	Literal value: **ISO**
4	HD	R	Sending Facility	Facility Name^**CLIA number**^CLIA
4.1	IS	RE	Namespace ID	Uniquely identifies the facility that is sending the data.
4.2	ST	R	Universal ID	Must be a CLIA number
4.3	ID	R	Universal ID Type	Literal value: **CLIA**
5	HD	R	Receiving Application	Literal value: **NEDSS**
6	HD	R	Receiving Facility	Literal value: **TX-ELR**
7	TS	R	Date/Time of Message	Date and time of the message creation to the minute. **YYYYMMDDHHMMSS**
9	MSG	R	Message Type	Literal value: **ORU^R01^ORU_R01**
9.1		R	Namespace ID	**ORU**
9.2		R	Universal ID	**RO1**
9.3		R	Universal ID Type	**ORU_RO1**
10	ST	R	Message Control ID	**Date/Time of Message – Accession Number** Unique message identifier generated by the sending application; MSH-3 plus MSH-10 must be globally unique; OR ELR recommends timestamp to the millisecond

11	PT	R	Processing ID	Denotes whether the message is for; **P** = Production **D** = Debugging **T** = Training
12	VID	R	Version ID	Literal value: **2.5.1**
17	ID	R	Country Code	Value Set: *PHVS_Country_ISO_3166-1* Example: **USA**
21	EI	R	Message Profile Identifier	We recommend populating with the following literal value: **PHLabReportNoAck^ELR_Receiver^2.16.840.1.113883.9.11^ISO**
21.1	ST		Entity Identifier	literal value: **PHLabReport-NoAck**
21.2	IS	RE	Namespace ID	literal value: **ELR_Receiver**
21.3	ID	R	Universal ID	literal value:**2.16.840.1.113883.9.11**
21.4	ID	R	Universal ID Type	literal value: **ISO**

SFT – Software Segment

The SFT segment provides information about the sending application or other applications that manipulate the message. The Laboratory Result Sender is required to populate the first SFT segment. Any other application that transforms the message must add an SFT segment for that application. Oregon ELR does not evaluate multiple SFT segments.

SFT – Software Segment				
Seq	**Data Type**	**Use**	**Name**	**Comments**
1	XON	R	Software Vendor Organization	Example: Level Seven Healthcare, Inc. L^^^^Lab&2.16.840.1.113883.19.4.6&ISO^XX^^^1234
2	ST	R	Software Version or	Example: 1.2
3	ST	R	Software Product Name	Example: LabWare Systems
4	ST	R	Software Binary ID	
6	TS	RE	Software Install Date	Minimum granularity to the day

PID – Patient Identification Segment

The PID segment is used to provide basic demographics regarding the subject of the testing. The subject may be a person or an animal.

PID – Patient Identification Segment				
Seq	**Name**	**Data Type**	**Use**	**Comments**
1	Set ID – PID	SI	R	Literal value: **1**
3	Patient Identifier List	CX	R	Patient identifiers may include: medical record number, social security, etc. Up to 4 identifiers separated with ~ Example : ID Number **^^^** Assigning Authority Name **&** OID **&ISO^** Identifier Type **^** Assigning Facility Name **&** OID **&ISO**
3.1	IDNumber	ST	R	Medical Record Number(MRN) is preferred
3.4	Assigning Authority	HD	R	
3.4.1	Namespace ID	IS	RE	Null values are not allowed.
3.4.2	Universal ID	ST	R	Only OID is allowed
3.4.3	Universal ID Type	ID	R	Literal value: **ISO**
3.5	Identifier Type Code	ID	R	Expected ORU Literal Values: • MA – Patient Medicaid Number • MC – Patient Medicare Number • MR – Medical Record Number • PI – Patient Internal Identifier • SS – Social Security Number • PIN – Prison Identification Number
3.6	Assigning Facility	HD	R	
3.6.1	Namespace ID	IS	RE	Null values are not allowed.
3.6.2	Universal ID	ST	R	Only CLIA is allowed
3.6.3	Universal ID Type	ID	R	Literal value: **CLIA**
5	Patient Name	XPN	R	Value sets: HL70200, HL70360 Example: John^Jonathan^James^Jr^^^L

5.1	Family Name	FN	R	Last name
5.2	Given Name	ST	R	First name
5.3	Middle Initial Or Name	ST	O	
5.4	Suffix (e.g., JR or III)	ST	O	
5.7	Name Type Code	ID	O	PHVS_NameType_HL7_2X
7	Date/Time of Birth	TS	RE	Minimum granularity to the day. YYYYMMDD. Example: 19701012
8	Administrative Sex	IS	RE	Gender: Female (**F**), Male (**M**), Other (**O**), or Unknown (**U**) Example: M
10	Race	CWE	RE	Value set: *HL70005*, *HL70396* Example: 2106-3^White^HL70005^^^^2.5.1
10.1	Identifier	ST	R	The identifier component is always required.
10.2	Text	ST	RE	It is strongly recommended that text be sent to accompany any identifier.
10.3	Name of Coding System	ID	R	Required if an identifier is provided in component 1.
10.4	Alternate Identifier	ST	RE	
10.5	Alternate Text	ST	RE	
10.6	Name of Alternate Coding System	ST	RE	Required if an alternate identifier is provided in component 4.
10.7	Coding System Version ID	ST	CE	Expecting the literal value “2.5.1”.
10.8	Alternate Coding System Version ID	ST	RE	
10.9	Original Text	ST	RE	
11	Patient Address	XAD	RE	Value sets: *HL70190*, *PHVS_County_FIPS_6-4*, *PHVS_State_FIPS_5-2* Hospitals **must** send patient address, including zip code, laboratories should send it if known. If a laboratory does not capture patient address, they must send the name and address/phone number of the ordering provider.

13	Phone Number – Home	XTN	RE	Value sets: *HL70201*, *HL70202* Example: ^PRN^CP^^^503^5555555
14	Phone Number – Business	XTN	RE	If populated, the Area/City Code and the Local Number are required. Value sets: *HL70201*, *HL70202* Example: ^WPN^PH^^^512^7761111
19	SSN Number	ST	O	
22	Ethnic Group	CWE	R	Value set is in HL70189 table. Example: N^Non-Hispanic^HL70189^^^^2.5.1
29	Patient Death Date and Time	TS	RE	Minimum granularity to the day *Example: 201505060827*
30	Patient Death Indicator	ID	RE	Value set is in HL70136 table. If PID-29 is populated then PID-30 must be **Y**
33	Last Update Date/Time	TS	RE	Minimum granularity to the minute *Example: 201505061133*
34	Last Update Facility	HD	CE	This is the facility that originated the demographic update. Condition predicate: If PID-33 is present this is required
35	Species Code	CWE	RE	Used for animal rabies testing related to human testing Value sets: *PHVS_Animal_CDC*, *HL70396* Example: |91230005^American short haired guinea pig^LN^^^^5^PHVS_Animal_CDC|

ORC – Common Order Segment

The ORC segment includes identifiers related to ordering the specimen (i.e., who placed the order, when it was placed, what action to take regarding the order, etc.).

ORC – Common Order Segment				
Seq	**Name**	**Data Type**	**Use**	**Comments**
1	Order Control	ID	R	Literal value: **"RE."**
2	Placer Order Number	EI	CE	If ORC-2 Placer Order Number is populated; this field must contain the **same value as OBR-2**. Example: 32112345678900^EHR^OID Number^ISO
3	Filler Order Number	EI	R	This field must contain the same value as OBR-3 Filler Order Number. If the reporting facility is NOT the facility that performed the test, we need to have the filler order number to link the results from the reporting facility to the results from the performing facility. The filler order number must be used in this circumstance.
12	Ordering Provider	XCN	CE	Required to be populated with the same values as OBR 16, Ordering Provider. Example: 1234^Doe^John^J^II^Dr^^^Lab& OID Number&ISO^L^^^EI^^^^^^^^MD
12.1	ID Number	ST	RE	
12.2	Family Name	FN	RE	
12.3	Given Name	ST	RE	
12.4	Second and Further Given Names or Initials Thereof	ST	RE	
12.5	Suffix (e.g., JR or III)	ST	RE	
12.6	Prefix (e.g., DR)	ST	RE	
12.7	Degree (e.g., MD)	ST	O	
12.9	Assigning Authority	HD	C	NamespaceID^Universal ID^ISO
14	Call Back Phone Number	XTN	RE	Must contain the same value as OBR-17; (contact number of ordering provider)
21	Ordering Facility Name	XON	R	Example: Dallas Clinic ^L^^^^County Hospital & 41D0733684&CLIA
22	Ordering Facility Address	XAD	R	
22.1	Street Address	ST	RE	
22.2	Other Designation	ST	RE	
22.3	City	ST	RE	
22.4	State or Province	ST	RE	

22.5	Zip or Postal code	ST	RE	
22.6	Country	ID	RE	
22.7	Address Type	ID	RE	
22.9	County/Parish Code	IS	RE	
23	Ordering Facility Phone Number	XTN	R	
23.1				
23.2	Telecommunication Use Code	ID	RE	
23.3	Telecommunication Equipment Type	NM	RE	
23.4	Email Address	ST	C	
23.5	Country Code	NM	c	
23.6	Area/City Code	NM	C	
23.7	Local Number	NM	C	
23.8	Extension	NM	C	
23.9	Any Text	ST	RE	
24	Ordering Provider Address	XAD	RE	Address of the care provider requesting the order. Example: Austin Medical Center^4444 Research Drive^Austin^TX^78788^USA^B

OBR – Observation Request Segment

The OBR identifies the type of testing to be performed on the specimen and links that information to the testing order.

OBR – Observation Request Segment				
Seq	**Name**	**Data Type**	**Use**	**Comments**
1	Set ID – OBR	SI	R	Sequence number of one of multiple OBRs under one PID. For the first order transmitted, the sequence number shall be 1; for the second order, it shall be 2; and so on.
2	Placer Order Number	EI	RE	Identifier assigned to the placer of the specific order; must contain the same value as ORC-2
3	Filler Order Number	EI	RE	Identifier assigned to the order by the organization performing the test; when combined with OBR-2 must be unique; must contain the same value as ORC-3
4	Universal Service Identifier	CWE	R	Test panel / Profile
4.1	Identifier	ID	RE	
4.2	Text	ST	CE	
4.3	Name of Coding System	ID	CE	
4.4	Alternate Identifier	ST	RE	
4.5	Alternate Text	ST	CE	
4.6	Name of Alternate Coding System	ID	CE	
4.7	Coding System Version ID	ST	RE	
4.8	Alternate Coding System Version ID	ST	RE	
4.9	Original Text	ST	CE	
7	Observation Date/Time	DTM	R	This should be the date and time of specimen collection.
13	Relevant Clinical Information	ST	RE	
14	Specimen Received Date/Time	DTM	R	Date specimen received Format: YYYYMMDDHHMM[SS]

16	Ordering Provider	XCN	RE	Provider who ordered the test; must be the same as ORC-12
17	Order Callback Phone Number	XTN	RE	Contact number for the ordering provider; same as ORC-14
22	Results Report/Status Change – Date/Time	TS	R	
24	Results Report/Status Change – Date/Time	ID	RE	
25	Result Status	ID	R	Indicates preliminary (**P**), final (**F**) or corrected (**C**) result
26	Parent Result	PRL	CE	Used with OBR-29 (Parent); allows linkages with specific OBX segment associated with another OBR
29	Parent	EIP	CE	Used to link this OBR with a parent OBR. Commonly used with microbiology messages to link a susceptibility result with the parent culture that identified the Organism. For this linkage to work Properly, the Placer Order Number and the Filler Order Number must uniquely identify the specific parent OBR.
31	Reason for Study	CWE	RE	ICD-9 or ICD-10 can be used

OBX – Observation/Result Segment

The OBX contains information regarding a single observation (result) related to a single test (OBR) or specimen (SPM) (including the specific type of observation, the result for the observation, when the observation was made, etc.).

OBX – Observation/Result Segment				
Seq	**Name**	**Data Type**	**Use**	**Comments**
1	Set ID – OBX	SI	R	Sequential number for each OBX segment, must start with 1
2	Value Type	ID	CE	Identify the data type used for OBX-5; if data type is CE (coded elements), use SNOMED CT in OBX-5 Value set: *HL70125* Example: CWE
3	Observation Identifier	CWE	R	OBX-3 has to have a code for the observation and CDC recommends using LOINC be used as the coding system to identify cases of illness which are reportable to public health. OBX-3 should be focal point of the report. Example: 625-4^Bacteria identified^LN
3.1	Identifier	ST	R	Expecting a LOINC code for the observation/result, if an appropriate LOINC code exists.
3.2	Text	ST	RE	
3.3	Name of Coding System	ST	R	Literal value: **"LN"**, if OBX-3.1 and OBX-3.2 are populated.
3.4	Alternate Identifier	ST	RE	Alternate local code the laboratory uses to uniquely identify the observation/result
3.5	Alternate Text	ST	CE	The text description for the local code in OBX-3.4.
3.6	Name of Alternate Coding System	ST	CE	Identifies the type of code in OBX-3.4.
4	Observational Sub-ID	ST	CE	To distinguish between multiple OBX segments with the same observation ID organized until one OBR. E.g., blood culture may have 3 different organisms to report from the one request. Value should be 1, 2, 3 etc.

5	Observation Value	Var	CE	Value must correspond to the data type entered in OBX-2; when OBX-2 is CE, use SNOMED CT/ Vocabulary standard: *SNOMED CT* Example: 66543000^Campylobacter jejuni^SCT
CWE format for OBX-5 (5.1 to 5.6)				
5.1	Identifier (SNOMED CT)	ST	R	SNOMED CT code identifying the observation/result.
5.2	Text (SNOMED CT)	ST	R	Text description for the SNOMED CT code in OBX-5.1.
5.3	Name of Coding System(SNOMED CT)	ID	R	Literal value: "SCT", if OBX-5.1 and OBX-5.2 are populated
5.4	Alternate Identifier (Local)	ST	RE	
5.5	Alternate Text (Local)	ST	CE	Laboratory result description (not the SNOMED-CT description)
5.6	Name of Alternate Coding System (Local)	ID	CE	
SN format for OBX-5 (5.1 to 5.6)				
5.1	Comparator	ST	RE	Must be one of ">" or "<" or ">=" or "<=" or "=" or "<>". This component defaults to "=" if empty.
5.2	Num1	NM	RE	Numeric value
5.3	Separator/Suffix	ST	RE	Must be one of "-" or "+" or "/" or "." Or ":".
5.4	Num2	NM	RE	Numeric value
6	Units	CWE	CE	If OBX-2 is SN *Value sets:* PHVS_UnitsOfMeasure_CDC, HL70396 Example: uL^MicroLiter [SI Volume Units]^UCUM^^^^1.6
7	Reference Ranges	ST	RE	Interpretation range that applies to OBX-5; should be enough information to understand abnormal flags in OBX-8; required if OBX-2 is SN and represents ordinal structured data

8	Abnormal Flags	CWE	CE	Indicates the normalcy of OBX-5 Value sets: *HL70078*, *HL70396* This is used as a modifier field for ordinal results, e.g. if the result is positive, the abnormal flag can be used to indicate a high or a low positive. It is also a mandatory field for submitters who are sending quantitative results that require interpretation.
11	Observation Result Status	ID	R	Indicates the status of the observation result, typically preliminary (**P**), final (**F**), or corrected (**C**) Value set: *HL70085* Example: P
14	Date/Time of the Observation	TS	CE	Specimen collection date/time; must be the same as OBR-7 and SPM-17.1; minimum granularity to the day Example: 201212130810
17	Observation Method	CWE	CE	Method of testing used by the laboratory Value sets: *PHVS_LabTestMethods_CDC*, *HL70396* Example: 0086^Bacterial identification^OBSMETHOD^^^^ 501-20080815
19	Date/Time of the Analysis	TS	RE	Date/Time the test was actually performed; minimum granularity to the day Example: 200906051700
23	Performing Organization Name	XON	R	The laboratory that produced the test result in this OBX Value sets: *HL70204*, *HL70203* Example: GHH Lab^L^^^^CLIA&2.16.840.1.113883.19.4.6& ISO^XX ^^^1236
24	Performing Organization Address	XAD	R	Address of the lab that performed the test Value sets: *HL70190*, *PHVS_County_FIPS_6-4*, *PHVS_State_FIPS_5-2* Example: 3434 Research road^^Austin^TX^78754^ USA^B
25	Performing Organization Medical Director	XCN	RE	Value sets: *HL70200*, *HL70203*, *HL70360* Example: 9876543^Jonah^Jang^S^^^^^NEDSS& 2.16.840.1.113883.19.4.6 &ISO^L^^^NPI

NTE – Notes and Comments Segment

The NTE is used to convey additional information regarding the associated segment. While one or more NTE segments can be associated with PID and OBR segments, Oregon ELR only expects NTEs associated with OBX segments. The contents of the NTE segment are primarily intended for human use and therefore should not be used to relay relevant clinical information.

NTE – Notes and Comments				
Seq	**Type**	**Us**	**Name**	**Comments**
1	SI	R	Set ID – NTE	Sequential number for each NTE segment, must start with 1
2	ID	RE	Source of Comment	Specifies where the comment came from: Ancillary source (**L**), the orderer or provider (**P**), or other source (**O**) Example: L
3	FT	R	Comment	Example: A comment or note goes here.
4	CWE	RE	Comment Type	Value set: *HL70364* Example: RE^Remark^HL70364^^^^2.5.1

SPM – Specimen Segment

SPM – Specimen				
Seq	**Type**	**Us**	**Name**	**Note**
1	SI	R	Set ID – SPM	Sequential number for each SPM segment, must start with 1
2	EIP	R	Specimen ID	Unique Identifier (Accession Number) for the specimen as referenced by the_Placer and Filler applications. Example: 201212131307001513823817765580000OA 20120000199111469050^OA20120000199&EHR&38D0622795&CLIA
4	CWE	R	Specimen Type	This is the specimen source. This is a mandatory field for all culture-based tests. Value set: *PHVS_SpecimenType_HL7_2x*, *HL70396* Example: 119297000^Blood^SCT
5	CWE	RE	Specimen Type Modifier	Use when SPM-4 is a SNOMED CT code Value sets: *PHVS_ModifierOrQualifier_CDC*, *HL70396* Example: 260304006^0.5 (qualifier value)^SCT
6	CWE	RE	Specimen Additives	Value set: *HL70371*, *HL70396*
7	CWE	RE	Specimen Collection Method	Value sets: *PHVS_SpecimenCollectionMethod_HL7_2x*, *HL70396* Example: BCAE^Blood Culture, Aerobic Bottle^HL70488^^
8	CWE	RE	Specimen Source Site	For environmental samples, describe the location of the source specimen; for biological samples, describe the anatomical site from which the specimen was collected Value sets: *PHVS_BodySite_HITSP*, *HL70396* Example: 49852007^Structure of median cubital vein (body structure)^SCT
9	CWE	RE	Specimen Source Site Modifier	Only used if SPM-8 is a SNOMED CT code Value sets: *PHVS_ModifierOrQualifier_CDC*, *HL70396* Example: 260304006^0.5 (qualifier value)^SCT
11	CWE	RE	Specimen Role	Value sets: *PHVS_SpecimenRole_CDC*, *HL70396* Example: P^Patient^HL60369

12	CQ	RE	Specimen Collection Amount	Amount of specimen collected (weight or mass) Value set: *PHVS_UnitsOfMeasure_CDC* Example: 2.0^mL&MilliLiter& UCUM&&&&1.6
17	DR	R	Specimen Collection Date/Time	Component 1 must match OBR-7 and OBX-14, component 2 must match OBR-8; minimum granularity to the day Example: 201212130810
18	TS	R	Specimen Received Date/Time	Date and time the specimen was received by the laboratory; minimum granularity to the minute Example: 20121213130700
21	CWE	RE	Specimen Reject Reason	Value sets: *HL70490*, *HL70396* Example: RN^Contamination^HL70490^^^^2.5.1

Texas ELR Issue Resolution Checklist-

Common critical areas to address during message pre-testing

Message Header: MSH

Issue #	Item	What does good look like?
1	MSH4 – Sending Facility -- Verify a CLIA number is used as the ID	`Reporting Institution Name^99XXXXXXX^CLIA`

Patient Information: PID

Issue #	Item	What does good look like?
2	PID10 – Patient Race -- Verify standard race codes are used	`2131-1^Other^HL70005`
3	PID22 – Patient Ethnicity -- Verify standard ethnicity codes are used	`N^Non Hispanic^HL70189`

Observation Request: OBR

Issue #	Item	What does good look like?
4	OBR4– Verify a LOINC code is used as the UniversalServiceID	`24325-3^Hepatic Function Panel^LN`
5	OBR4 – Verify LOINC is in OBR4.1-4.3	**`24325-3^Hepatic Function Panel^LN`**`^321^HEP^L`
6	OBR4 – Verify local codes, if provided, are in OBR4.4-4.6	`24325-3^Hepatic Function Panel^LN^`**`321^HEP^L`**

Observation Result: OBX

Issue #	Item	What does good look like?
7	OBX – Verify every OBX segment is only used to provide standardized test results	The following OBX segment should actually be created as an NTE segment: `OBX|2|TX|49580-4^^LN^HIVR^HIV-RAPID TEST^99USI|11|Called to and read back by: |`
8	OBX2 – Verify only SN, CE, or CWE	`OBX|1|`**`CE`**`|`
9	OBX3 – Verify a LOINC code is used as the ObservationIdentifer	`625-4^Stool Culture^LN`
10	OBX3 – Verify LOINC is in OBX3.1-3.3	**`625-4^Stool Culture^LN`**`^225^Stool Culture^L`
11	OBX3 – Verify local codes, if provided, are in OBX3.4-3.6	`625-4^Stool Culture^LN^`**`225^Stool Culture^L`**
12	OBX5 – Verify a SnoMed code is used as the ObservationValue for discreet results (CE/CWE)	`372342007^Salmonella species (organism)^SCT`
13	OBX5 – Verify SnoMed is in OBX5.1-5.3 for discreet results (CE/CWE)	**`11214006^REACTIVE^SCT`**`^REACTIVE^REACTIVE^L`
14	OBX5 – Verify local codes, if provided, are in OBX5.4-5.6 for discreet results (CE/CWE)	`11214006^REACTIVE^SCT^`**`REACTIVE^REACTIVE^L`**
15	OBX5 – Verify titers are created as structured numerics	`|^1^:^16|`

16	OBX5 – Verify all numeric values are created as structured numerics, with comparator (if present) is in OBX5.1	`|>^500|`

Specimen: SPM

Issue #	Item	What does good look like?
17	SPM4 – Verify a standardized code is used in Specimen Type	`119297000^Blood^SCT`

Appendix A – Data Types

Only data types used in this guide are represented in the table below. For more explicit details on data type construction, please visit http://www.HL7.org. Selected tables and value sets referenced in this table are available in Appendix B – Value Sets.

Data Type	Name	Structure (Relevant Value Set)	Examples
CQ	Composite Quantity with Units	|Quantity^Units (*PHVS_UnitsOfMeasure_CDC*)|	|150^m&meter&UCUM|
CE	Coded Element	|ID^Text^ Coding System (*HL70396*)^Alternate ID^Alternate Text^Alternate Coding System (*HL70396*)|	|625-4^Bacteria identified:Prid:Pt:Stool: Nom:Culture^LN^BAC^Bacteria Culture ^99Lab^2.26^May 2006|
CWE	Coded with Exceptions	|ID^Text^ Coding System (*HL70396*)^Alternate ID^Alternate Text^Alternate Coding System (*HL70396*)^Coding System Version ID^Alternate Coding System Version ID^Original Text|	**Except OBX-5** |625-4^Bacteria identified:Prid:Pt:Stool: Nom:Culture^LN^BAC^Bacteria Culture ^99Lab^2.26^May 2006| **OBX-5 only** |302620005^Salmonella group B phase 1 a-e^SCT^Sal^ Salmonella group B^ 99LabMicro^20080731|
CX	Extended Composite ID with Check Digit	|ID^^^Assigning Authority^Identifier Type (*HL70203*)|	|36363636^^^MPI&2.16.840.1.113883.1 9.3.2.1&ISO^MR|
DR	Date/Time Range	|Start Date^End Date|	|20080602^20090602|
EI	Entity Identifier	|Entity ID^Namespace ID^OID^ISO|	|23456^EHR^2.16.840.1.113883.19.3.2.3 ^ISO|
EIP	Entity Identifier Pair	|Placer ID^Filler ID|	|23456&EHR&2.16.840.1.113883.19.3.2.3&ISO^9700122&Lab&2.16.840.1.113888 3.19.3.1.6&ISO|
FT	Formatted Text Data	|Formatted Text|	|Culture \T\ Sensitivity Report| *Use escape character to format text*

HD	Hierarchic Designator	|Namespace ID^Universal ID (OID or CLIA Number)^Universal ID Type (ISO or CLIA)|	|Lab^2.16.840.1.113883.19.3.1.1^ISO| *HD.2 must be an OID except MSH-3 where it must be a CLIA identifier; HD.3 must be ISO except MSH-3 where it must be CLIA*
ID	Coded Value for HL7 Defined Tables	|Coded Value|	|ABC|

Data Type	Name	Structure (Relevant Value Set)	Examples
IS	Coded Value for User- Defined Tables	|Coded Value|	|XYZ|
NM	Numeric	|Numeric|	|123.4|
PL	Person Location	|Point of Care^Room^Bed^Facility^ Person Location Type^Building^Floor ^Location Description^Location Identifier^ Assigning Authority|	**Note:** While all components are optional room number and facility are encouraged |^615^^ Hospital& 2.16.840.1.113883.19.3.2.3&ISO|
PRL	Parent Result Link	|Parent OBR ID^Parent OBR Sub- ID^Parent OBR Value Descriptor|	|625-4^1^Campylobacter jejuni|
SI	Sequence ID	|ID|	|1|
SN	Structured Numeric	|Comparator^Num1^Separator/Suffi x^Num2|	|^0^-^1| **OR** |^1^/^2| **OR** |^1^:^2| **OR** |<^10| **OR** |2^+|
ST	String	|String Data|	|Just about anything goes in here|
TS	Time Stamp	|YYYYMMDDHHMM.SSSS-ZZZZ|	|200806021328.0001-0005|
TX	Text Data	|Text|	| can have leading spaces.|
VID	Version Identifier	|Version ID|	|2.5.1|
XAD	Extended Address	|Street Address^Other Designation^City^State (*PHVS_State_FIPS_5-2*)^Zip^Country (*PHVS_Country_ISO_3166-1*)^Address Type (*HL70190*)^^County (*PHVS_County_FIPS_6-4*)	|4444 Healthcare Drive^Suite 123^Portland^OR^97232^USA^B^^Mult nomah|

XCN	Extended Composite ID Number and Name	|ID Number^Family Name^Given Name^Middle Name^Suffix^Prefix ^^^Assigning Authority^Name Type (*HL70200*)^^^ID Type (*HL70203*)^^^ ^^^^^ Professional Suffix (*HL70360*)|	|1234^Admit^Alan^A^III^Dr^^^Lab&2.16.840.1.113883.19.4.6&ISO^L^^^EI^^^^^^^^MD|
XON	Extended Composite Name and ID Number for Organizations	|Organization Name^Organization Name Type (*HL70204*)^^^^Assigning Authority^ID Type (*HL70203*) ^^^Organization ID|	|Level Seven Healthcare, Inc.^L^^^^Lab&2.16.840.1.113883.19.4.6 &ISO^XX^^^1234|
XPN	Extended Person Name	|Family Name^Given Name^MI^ Suffix^Prefix^^Name Type (*HL70200*) ^^^^^^Professional Suffix *HL70360*)|	|Admit^Alan^A^III^Dr^^L^^^^^^^MD|

Data Type	Name	Structure (Relevant Value Set)	Examples
XTN	Extended telecommunications number	|^Telecommunication Use (*HL70201*)^Equipment Type (*HL70202*)^Email Address^Country Code^Area Code^Local Number^Extension^Any Text|	|^PRN^PH^^1^555^5552003| **OR** |^NET^Internet^eve.woman@hl7.org| **HL7 specifies only sending email address if phone number is not present*

Appendix B – Sample Messages

Culture Result:

```
MSH|^~\&|SendingApp|Reporting Institution
Name^99XXXXXXX^CLIA|NEDSS|TX|yyyymmdd||ORU^R01^ORU_R01|msgControlID|P|2.5.1|||||USA
SFT|OrganizationName|VersionNum|SoftwareProductName|SoftwareBinaryID||yyyymmdd
PID|1||999999999^^^Hospital Name&99XXXXX&CLIA^MR^Hospital Name&99XXXXXXX&CLIA~99999999^^^Hospital
Name&99XXXXXXX&CLIA^PI^Hospital Name&99XXXXXX&CLIA~999999999^^^2.16.840.1.113883.4.1^SS||Last Name^First
Name^Middle Initial^^^^L||yyyymmdd|Sex||Race Code^Race Description^HL70005|Street
Address^^City^State^Zipcode^USA^C^^||9999999999^PRN^PH^^^999^9999999|||||||||Ethnicity Code^Ethnicity
Description^HL70189
ORC|RE||999999999^EHR^99XXXXXXX^CLIA|||||||||^Ordering Doc Last Name^Doc First Name^DOC Middle
Initial^^^MD||9999999999^^^^^999^9999999|||||||Ordering Hospital Name|Ordering Hospital Street
Address^^City^State^Zipcode|9999999999^^PH^^^999^9999999|Ordering DOC Street Address^^City^State^Zipcode
OBR|1||999999999^EHR^99XXXXXXXX^CLIA|625-4^Bacteria Stl Cult^LN^CULST^Culture
Stool^L|||yyyymmddhhmmss||||||None|||DocID at Hospital^Ordering Doc Last Name^Doc First Name^Middle
Initial^^^^^Hospital Name&99XXXXXX&CLIA^L|^^PH^^^999^9999999|||||yyyymmddhhmmss||LAB|F
OBX|1|CE|625-4^Bacteria Stl Cult^LN^9999^RSLT#1^L|1|L-1712B^Salmonella species^SNM^LocalSalmCode^LocalSalmonella
species name^L|||A|||F|||yyyymmdd|99XXXXXXX^Performing Hospital Name^CLIA|||||||Performing Hospital
Name^L^^^^Hospital Name&99XXXXXXX&CLIA|Performing Hospital Street Address^^City^State^Zipcode^USA  NTE|1||Comments
SPM|1|^999999999&EHR&99XXXXXXX&CLIA||STL^Stool=Fecal^HL70487^Stool^Stool/Feces^L|||||||||||||yyyymmddhhmmss|yyyymm
ddhhmmss
```

Probe Result:

```
MSH|^~\&|SendingApp|Reporting Institution
Name^99XXXXXXX^CLIA|NEDSS|TX|yyyymmdd||ORU^R01^ORU_R01|msgControlID|P|2.5.1||||USA
SFT|OrganizationName|VersionNum|SoftwareProductName|SoftwareBinaryID||yyyymmdd
PID|1||999999999^^^Hospital Name&99XXXXX&CLIA^MR^Hospital Name&99XXXXXXX&CLIA~99999999^^^Hospital
Name&99XXXXXXX&CLIA^PI^Hospital Name&99XXXXXX&CLIA~999999999^^^2.16.840.1.113883.4.1^SS||Last Name^First
Name^Middle Initial^^^^L||yyyymmdd|Sex||Race Code^Race Description^HL70005|Street
Address^^City^State^Zipcode^USA^C^^||9999999999^PRN^PH^^^999^9999999|||||||||Ethnicity Code^Ethnicity
Description^HL70189
ORC|RE||999999999^EHR^99XXXXXXX^CLIA|||||||||^Ordering Doc Last Name^Doc First Name^DOC Middle
Initial^^^MD||9999999999^^^^^999^9999999|||||||Ordering Hospital Name|Ordering Hospital Street
Address^^City^State^Zipcode|9999999999^^PH^^^999^9999999|Ordering DOC Street Address^^City^State^Zipcode
OBR|1||999999999^EHR^99XXXXXXXX^CLIA|21613-5^Chlamydia trachomatis Probe^LN^999^Chlamydia
Probe^L|||yyyymmddhhmmss||||||None|||DocID at Hospital^Ordering Doc Last Name^Doc First Name^Middle
Initial^^^^^Hospital Name&99XXXXXX&CLIA^L|^^PH^^^999^9999999|||||yyyymmddhhmmss||LAB|F  OBX|1|CE|50387-0^Chlamydia
trachomatis rRNA^LN^186134^Chlamydia, Nuc. Acid Amp^L||G-
A200^Positive^SNM^P^Positive^L||Negative|A|||F|||yyyymmdd|99XXXXXXX^Performing Hospital
Name^CLIA|||||||Performing Hospital Name^L^^^^Hospital Name&99XXXXXXX&CLIA|Performing Hospital Street
Address^^City^State^Zipcode^USA  NTE|1||Comments
SPM|1|^999999999&EHR&99XXXXXXX&CLIA||CVX^Cervix^HL70487^119395005^Cervix^SCT|||||||||||||yyyymmddhhmmss|yyyymmddhh
mmss
```

Quantifiable Result:

```
MSH|^~\&|SendingApp|Reporting Institution
Name^99XXXXXXX^CLIA|NEDSS|TX|yyyymmdd||ORU^R01^ORU_R01|msgControlID|P|2.5.1|||||USA
SFT|OrganizationName|VersionNum|SoftwareProductName|SoftwareBinaryID||yyyymmdd
PID|1||999999999^^^Hospital Name&99XXXXX&CLIA^MR^Hospital Name&99XXXXXXX&CLIA~99999999^^^Hospital
Name&99XXXXXXX&CLIA^PI^Hospital Name&99XXXXXX&CLIA~999999999^^^2.16.840.1.113883.4.1^SS||Last Name^First
Name^Middle Initial^^^^L||yyyymmdd|Sex||Race Code^Race Description^HL70005|Street
Address^^City^State^Zipcode^USA^C^^||9999999999^PRN^PH^^^999^9999999|||||||||Ethnicity Code^Ethnicity
Description^HL70189
ORC|RE||999999999^EHR^99XXXXXXX^CLIA|||||||||^Ordering Doc Last Name^Doc First Name^DOC Middle
Initial^^^MD||9999999999^^^^^999^9999999|||||||Ordering Hospital Name|Ordering Hospital Street
Address^^City^State^Zipcode|9999999999^^PH^^^999^9999999|Ordering DOC Street Address^^City^State^Zipcode
OBR|1||999999999^EHR^99XXXXXXXX^CLIA|24363-4^Hepatitis Panel, Acute^LN^AHepPan^Acute Hepatitis
Panel^L|||yyyymmddhhmmss||||||None|||DocID at Hospital^Ordering Doc Last Name^Doc First Name^Middle
Initial^^^^^Hospital Name&99XXXXXX&CLIA^L|^^PH^^^999^9999999|||||yyyymmddhhmmss||LAB|F
OBX|1|SN|20416-4^Hepatitis C virus RNA^LN^140539^Hepatitis C Quantitation^L||^26000|Copies/mL|||||
F|||yyyymmdd|99XXXXXXX^Performing Hospital Name^CLIA|||||||Performing Hospital Name^L^^^^Hospital
Name&99XXXXXXX&CLIA|Performing Hospital Street Address^^City^State^Zipcode^USA
NTE|1||Comments
SPM|1|^999999999&EHR&99XXXXXXX&CLIA||Ser^Serum^HL70487^Serum^Serum^L|||||||||||||yyyymmddhhmmss|yyyymmddhhmmss
```

Screening test with titer:

```
MSH|^~\&|SendingApp|Reporting Institution
Name^99XXXXXXX^CLIA|NEDSS|TX|yyyymmdd||ORU^R01^ORU_R01|msgControlID|P|2.5.1|||||USA
SFT|OrganizationName|VersionNum|SoftwareProductName|SoftwareBinaryID||yyyymmdd
PID|1||999999999^^^Hospital Name&99XXXXX&CLIA^MR^Hospital Name&99XXXXXXX&CLIA~99999999^^^Hospital
Name&99XXXXXXX&CLIA^PI^Hospital Name&99XXXXXX&CLIA~999999999^^^2.16.840.1.113883.4.1^SS||Last Name^First
Name^Middle Initial^^^^L||yyyymmdd|Sex||Race Code^Race Description^HL70005|Street
Address^^City^State^Zipcode^USA^C^^||9999999999^PRN^PH^^^999^9999999|||||||||Ethnicity Code^Ethnicity
Description^HL70189
```

```
ORC|RE||999999999^EHR^99XXXXXXX^CLIA|||||||||^Ordering Doc Last NameE^Doc First Name^DOC Middle
Initial^^^MD||9999999999^^^^^999^9999999|||||||Ordering Hospital Name|Ordering Hospital Street
Address^^City^State^Zipcode^USA
```

References

ELR and PIP (Promoting Interoperability Program):

CDC Electronic Laboratory Reporting ELR / Electronic Laboratory Reporting | CDC

CDC PIP Public Health Data Interoperability (cdc.gov)

Public Health Information Network (PHIN) PHIN Tools and Resources (cdc.gov)

HL7 Messaging:

Data dictionary
V251_IG_LB_LABRPTPH_R2_DSTU_R1.1_2014MAY.pdf (hl7.org)

ELR 2.5.2 Clarification Document
ELR 2.5.1 Clarification Document for EHR Technology Certification, V1.2 (cdc.gov)

HL7 Log in page to access HL7 Documents
Health Level Seven International - Homepage | HL7 International

Public Health Information (PHIN) Vocabulary and Distribution System (VADS) and Reportable Condition Mapping Tables (RCMT)
PHIN VADS - Search All Vocabulary (cdc.gov)

Regenstrief LOINC (Logical Observation Identifiers Names and Codes) Mapping Assistant (RELMA)
About RELMA – LOINC

HL7 Message Test Tools:

National Institute of Standards and Technology (NIST) V2.5.1 Validation Tool
ELR Validation Tool @ NIST