TEXAS DEPARTMENT OF STATE HEALTH SERVICES

NATIONAL ELECTRONIC DISEASE SURVEILLANCE SYSTEM (NEDSS)

ELECTRONIC LABORATORY REPORTING HL7 IMPLEMENTATION GUIDE

HL7 VERSION 2.5.1

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

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Document History

Revision History	Issue Date	Editors	Notes
2.0	October 1, 2013	DSHS	Initial Document
2.1	April 20, 2016	DSHS	Revision
2.2	July 26, 2016	DSHS	Revision
3.0	January 30, 2023	Asenath Onderi Ayamba Ayuk-Tabe Robert Lewis	Major revision to include format and overall content.

I. Purpose

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 NEDSS producing acceptable HL7 messages and validating these messages for structure and vocabulary constraints. To meet the DSHS NEDSS 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 NEDSS may provide some comments about base HL7 specifications but cannot be relied upon as the sole authority for which all decisions are based.

II. Scope

This document provides the 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 HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health (US Realm), Release 1.

Please note that this implementation guide 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).

III. Definitions

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

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. Texas ELR ignores multiple SFT segments.
PID	Patient Identification	Demographic data about 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.

IV. MSH – Message Header Segment

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	Acceptable values: **TX-ELR, TX, TXDOH, or TX-DOH**
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	ID	R	Namespace ID	**ORU**
9.2	ID	R	Universal ID	**R01**
9.3	ID	R	Universal ID Type	**ORU_R01**
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

MSH – Message Header Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
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**
21	EI	R	Message Profile Identifier	We recommend populating with the following literal value: **PHLabReport-NoAck^ELR_Receiver^2.16.840.1.113883.9.11^ISO**
21.1	ST	R	Entity Identifier	Acceptable values: **PHLabReport-NoAck or PHLabReportNoAck**
21.2	IS	RE	Namespace ID	Acceptable values: **ELR_Receiver, HL7, TX-ELR**
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**

V. 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. Texas ELR does not evaluate multiple SFT segments.

SFT – Software Segment				
Seq	**Data Type**	**Usage**	**Element 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 Release Number	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

VI. 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	**Data Type**	**Usage**	**Element Name**	**Comments**
1	SI	R	Set ID – PID	Literal value: **1**
3	CX	R	Patient Identifier List	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	ST	R	ID Number	Medical Record Number(MRN) is preferred
3.4	HD	R	Assigning Authority	
3.4.1	IS	RE	Namespace ID	Null values are not allowed.
3.4.2	ST	R	Universal ID	Can be an OID or CLIA no.
3.4.3	ID	R	Universal ID Type	Acceptable values: **ISO or CLIA**
3.5	ID	R	Identifier Type Code	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	HD	R	Assigning Facility	
3.6.1	IS	RE	Namespace ID	Null values are not allowed.
3.6.2	ST	R	Universal ID	Can be an OID or CLIA no.
3.6.3	ID	R	Universal ID Type	Acceptable values: **ISO or CLIA**

PID – Patient Identification Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
5	XPN	R	Patient Name	Value set: *HL70200* Example: John^Jonathan^James^Jr^^^L
5.1	FN	R	Family Name	Last name
5.2	ST	R	Given Name	First name
5.3	ST	O	Middle Initial Or Name	
5.4	ST	O	Suffix (e.g., JR or III)	
5.7	ID	O	Name Type Code	Value set: *HL70200*
7	TS	RE	Date/Time of Birth	Minimum granularity to the day. YYYYMMDD. Example: 19701012
8	IS	RE	Administrative Sex	Gender: Female (**F**), Male (**M**), Other (**O**), or Unknown (U) Example: M
10	CWE	R	Race	Value set: *HL70005*, *PHVS_RaceCategory_CDC* Example: 2106-3^White^HL70005^^^^2.5.1
10.1	ST	R	Identifier	The identifier component is always required.
10.2	ST	RE	Text	It is strongly recommended that text be sent to accompany any identifier.
10.3	ID	R	Name of Coding System	Required if an identifier is provided in component 1.
10.4	ST	RE	Alternate Identifier	
10.5	ST	RE	Alternate Text	
10.6	ST	RE	Name of Alternate Coding System	Required if an alternate identifier is provided in component 4.
10.7	ST	CE	Coding System Version ID	Expecting the literal value “2.5.1”.

PID – Patient Identification Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
11	XAD	RE	Patient Address	Value sets: *HL70190*, *PHVS_County_FIPS_6-4*, *TX_COUNTY_FIPS_CODE* 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.
11.1	SAD	RE	Street Address	
11.2	ST	RE	Other Designation	
11.3	ST	RE	City	
11.4	ST	RE	State Or Province	
11.5	ST	RE	Zip or Postal Code	
11.6	ID	RE	Country	
11.9	IS	RE	County/Parish Code	For a list of Texas Counties and FIPS Codes, refer to : *TX_COUNTY_FIPS_CODE*
13	XTN	RE	Phone Number – Home	Value sets: *HL70201*, *HL70202* Example: ^PRN^CP^^^503^5555555
13.2	ID	RE	Telecommunication Use Code	
13.3	ID	RE	Telecommunication Equipment Type	
13.4	ST	CE	Email Address	
13.5	NM	CE	Country Code	
13.6	NM	RE	Area/City Code	
13.7	NM	RE	Local Number	
14	XTN	RE	Phone Number – Business	If populated, the Area/City Code and the Local Number are required. Value sets: *HL70201*, *HL70202* Example: ^WPN^PH^^^512^7761111

22	CWE	R	Ethnic Group	Value sets: *HL70189*, *PHVS_Ethnicity_CDC* Example: N^Non-Hispanic^HL70189^^^^2.5.1
29	TS	RE	Patient Death Date and	Minimum granularity to the day Example: 201505060827
30	ID	RE	Patient Death Indicator	Value set is in *HL70136* table. If PID-29 is populated, then PID-30 must be Y
35	CWE	RE	Species Code	Used for animal rabies testing related to human testing Value set: *PHVS_Animal_CDC* Example: |91230005^American short haired guinea pig^LN^^^^5^PHVS_Animal_CDC|

VII. 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	**Data Type**	**Usage**	**Element Name**	**Comments**
1	ID	R	Order Control	Literal value: **"RE."**
2	EI	CE	Placer Order Number	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	EI	R	Filler Order Number	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.
3.1	ST	R	Entity Identifier	
3.2	IS	RE	Namespace ID	
3.3	ST	RE	Universal ID	
3.4	ID	RE	Universal ID Type	
12	XCN	RE	Ordering Provider	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	ST	RE	ID Number	
12.2	FN	RE	Family Name	
12.3	ST	RE	Given Name	
12.4	ST	RE	Second and Further Given Names or Initials Thereof	
12.5	ST	RE	Suffix (e.g., JR or III)	
12.6	ST	RE	Prefix (e.g., DR)	
14	XTN	RE	Call Back Phone Number	Must contain the **same value as OBR-17**; (contact number of ordering provider)

ORC – Common Order Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
21	XON	R	Ordering Facility Name	Example: Dallas Clinic ^L^^^^County Hospital & 41D0733684&CLIA
21.1	ST	R	Organization Name	
21.2	IS	RE	Organization Name Type Code	Value set: *HL70204*
21.6	HD	RE	Assigning Authority	
22	XAD	R	Ordering Facility Address	
23	XTN	R	Ordering Facility Phone Number	
23.2	ID	RE	Telecommunication Use Code	
23.3	NM	RE	Telecommunication Equipment Type	
23.4	**ST**	CE	Email Address	
23.5	NM	CE	Country Code	
23.6	NM	RE	Area/City Code	
23.7	NM	RE	Local Number	
24	XAD	RE	Ordering Provider Address	Address of the care provider requesting the order. Example: Austin Medical Center^4444 Research Drive^Austin^TX^78788^USA^B

VIII. 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	**Data Type**	**Usage**	**Element Name**	**Comments**
1	SI	R	Set ID – OBR	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	EI	RE	Placer Order Number	Identifier assigned to the placer of the specific order; must contain the **same value as ORC-2**
3	EI	RE	Filler Order Number	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	CWE	R	Universal Service Identifier	Test panel / Profile
4.1	ID	RE	Identifier	Acceptable value: Universal standardized LOINC code. If sites do not have a LOINC code, then local code is required to be populated in OBR 4.4-4.6
4.2	ST	CE	Text	Text doesn't have to match LOINC.org word for word.
4.3	ID	CE	Name of Coding System	Literal value: LN
4.4	ST	RE	Alternate Identifier	Only Required if the site does not provide LOINC code in OBR 4.1-4.3.
4.5	ST	CE	Alternate Text	
4.6	ID	CE	Name of Alternate Coding System	Literal value: L
7	DTM	R	Observation Date/Time	This should be the date and time of specimen collection.
13	ST	RE	Relevant Clinical Information	
16	XCN	RE	Ordering Provider	Provider who ordered the test; must contain the **same value as ORC-12**
17	XTN	RE	Order Callback Phone Number	Contact number for the ordering provider; must contain the **same value as ORC-14**

OBR – Observation Request Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
22	TS	R	Results Report/Status Change – Date/Time	
24	ID	RE	Results Report/Status Change – Date/Time	
25	ID	R	Result Status	Indicates preliminary (**P**), final (**F**) or corrected (C) result
26	PRL	CE	Parent Result	Used with OBR-29 (Parent); allows linkages with specific OBX segment associated with another OBR
29	EIP	CE	Parent	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	CWE	RE	Reason for Study	ICD-9 or ICD-10 can be used

IX. 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	**Data Type**	**Usage**	**Element Name**	**Comments**
1	SI	R	Set ID – OBX	Sequential number for each OBX segment, must start with 1
2	ID	CE	Value Type	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	CWE	R	Observation Identifier	OBX-3 must have a code for the observation and CDC recommends 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	ST	R	Identifier	Expecting a LOINC code for the observation/result, if an appropriate LOINC code exists.
3.2	ST	RE	Text	
3.3	ST	R	Name of Coding System	Literal value: **"LN"**, if OBX-3.1 and OBX-3.2 are populated.
3.4	ST	RE	Alternate Identifier	Alternate local code the laboratory uses to uniquely identify the observation/result
3.5	ST	CE	Alternate Text	The text description for the local code in OBX-3.4.
3.6	ST	CE	Name of Alternate Coding System	Identifies the type of code in OBX-3.4.
4	ST	CE	Observational Sub- ID	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.

OBX – Observation/Result Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
5	Var	R	Observation Value	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	ST	R	Identifier (SNOMED CT)	SNOMED CT code identifying the observation/result.
5.2	ST	R	Text (SNOMED CT)	Text description for the SNOMED CT code in OBX- 5.1.
5.3	ID	R	Name of Coding System(SNOMED CT)	Literal value: "SCT", if OBX-5.1 and OBX-5.2 are populated
5.4	ST	RE	Alternate Identifier (Local)	
5.5	ST	CE	Alternate Text (Local)	Laboratory result description (not the SNOMED-CT description)
5.6	ID	CE	Name of Alternate Coding System (Local)	
SN format for OBX-5 (5.1 to 5.6)				
5.1	ST	R	Comparator	Must be one of ">" or "<" or ">=" or "<=" or "=" or "<>". This component defaults to "=" if empty.
5.2	NM	R	Num1	Numeric value
5.3	ST	R	Separator/Suffix	Must be one of "-" or "+" or "/" or "." Or ":".
5.4	NM	R	Num2	Numeric value
6	CWE	CE	Units	If OBX-2 is SN Value sets: *PHVS_UnitsOfMeasure_CDC* Example: uL^MicroLiter [SI Volume Units]^UCUM^^^^1.6
7	ST	RE	Reference Ranges	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

OBX – Observation/Result Segment				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
8	CWE	CE	Abnormal Flags	Indicates the normalcy of OBX-5 Value sets: *HL70078* 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	ID	R	Observation Result Status	Indicates the status of the observation result, typically preliminary (**P**), final (**F**), or corrected (C) Value set: *HL70085* Example: P
14	TS	CE	Date/Time of the Observation	Specimen collection date/time; must be the **same as OBR-7 and SPM-17.1**; minimum granularity to the day Example: 201212130810
17	CWE	RE	Observation Method	Method of testing used by the laboratory. Value set: *PHVS_LabTestMethods_CDC* Example: 0086^Bacterial identification^OBSMETHOD^^^^ 501-20080815
19	TS	RE	Date/Time of the Analysis	Date/Time the test was actually performed, minimum granularity to the day Example: 200906051700
23	XON	R	Performing Organization Name	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
23.1	ST	R	Organization Name	
23.2	IS	RE	Organization Name Type Code	Value set: *HL70204*
23.6	HD	RE	Assigning Authority	
23.10	ST	R	Organization Identifier	Only CLIA no. is allowed.
24	XAD	R	Performing Organization Address	Address of the lab that performed the test Value sets: : *HL70190*, *PHVS_County_FIPS_6-4*, *TX_COUNTY_FIPS_CODE* Example: 3434 Research Road^^Austin^TX^78754^ USA^B

X. 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, Texas 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	**Data Type**	**Usage**	**Element 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

XI. SPM – Specimen Segment

The Specimen Information Segment (SPM) describes the characteristics of a single sample. This segment carries information regarding the type of specimen, where and how it was collected, who collected it and some basic characteristics of the specimen.

SPM – Specimen				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
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: 20121213130700151382381776558000000A 20120000199111469050^OA20120000199&EHR&38D0622795&CLIA
2.1	EI	R	Placer Assigned Identifier	
2.2	EI	R	Filler Assigned Identifier	
4	CWE	R	Specimen Type	This is the specimen source. This is a mandatory field for all culture-based tests. Value sets: *HL70487*, *SNOMED CT* Example: 119297000^Blood^SCT
4.1	ST	R	Identifier	
4.2	ST	R	Text	
4.3	ID	R	Name of Coding System	Value sets: *HL70487*, *SNOMED CT*
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
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 set: *PHVS_BodySite_HITSP* Example: 49852007^Structure of median cubital vein (body structure)^SCT

SPM – Specimen				
Seq	**Data Type**	**Usage**	**Element Name**	**Comments**
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*, *HL70369* 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**, 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

XII. 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	`Sending Facility^45DXXXXXXX^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 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 Observation Value 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 numeric	|^1^:^16|
16	OBX5 – Verify all numeric values are created as structured numeric, 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

XIII. 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&2.16.840.1.11388 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	|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. 1 6.840.1.113883.19.4.6&ISO^L^^^EI^^^^ ^ ^^^MD|
XON	Extended Composite Name and ID Number for Organizations	|Organization Name^Organization Name Type (*HL70204*)^^^^Assigning Authority^ID Type (*HL70203*)	|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 telecommunicatios 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**

XIV. Appendix B – Sample Messages

Culture Result:

```
MSH|^~\&#|SENDINGAPP^OID^ISO|SENDING
FACILITY^45DXXXXXXX^CLIA|NEDSS|TX|YYYYMMDD||ORU^R01^ORU_R01|MSG
CONTROL|P|2.5.1|||||USA||||PHLABREPORT-NOACK^ELR_RECEIVER^2.16.840.1.113883.9.11^ISO|
SFT|ORGANIZATIONNAME|VERSIONNUM|SOFTWAREPRODUCTNAME|SOFTWAREBINARYID||YYYYMMDD
PID|1||999999999^^^SENDING FACILITY^45DXXXXXXX^CLIA^MR^SENDING
FACILITY^45DXXXXXXX^CLIA||LAST NAME^FIRST NAME^MIDDLE INITIAL^^^^L||YYYYMMDD|SEX||RACE
CODE^RACE DESCRIPTION^HL70005|STREET
ADDRESS^^LEWISVILLE^TX^ZIPCODE^USA^^^DENTON||^PRN^PH^^^999^9999999|||||||||ETHNICITY
CODE^ETHNICITY DESCRIPTION^HL70189|
ORC|RE||21D:67XXXX^EHR^45DXXXXXXX^CLIA|||||||||ID NUMBER^ORDERING PROVIDER LAST
NAME^PROVIDER FIRST NAME^^^MD^^^^^^^NPI||^^PH^^^999^9999999|||||||ORDERING HOSPITAL
NAME^L^^^^SENDING FACILITY&45DXXXXXXX&CLIA|ORDERING HOSPITAL STREET
ADDRESS^^CITY^STATE^ZIPCODE|^^PH^^^999^9999999|ORDERING PROVIDER STREET
ADDRESS^^CITY^STATE^ZIPCODE|
OBR|1||21D:67XXXX^EHR^45DXXXXXXX^CLIA|625-4^BACTERIA STL CULT^LN^CULST^CULTURE
STOOL^L|||YYYYMMDD|YYYYMMDD|||||||ID NUMBER^ORDERING PROVIDER LAST NAME^PROVIDER FIRST
NAME^^^MD^^^^^^^NPI|^^PH^^^999^9999999|||||YYYYMMDD||LAB|F|
OBX|1|CE|625-4^BACTERIA STL CULT^LN^9999^RSLT#1^L|1|27268008^SALMONELLA
SPECIES^SCT^LOCALSALMCODE^LOCALSALMONELLA SPECIES
NAME^L|||A|||F|||YYYYMMDD|||||||||PERFORMING HOSPITAL NAME^L^^^^^^^^CLIA NO.|PERFORMING
FACILITY STREET ADDRESS^^CITY^STATE^ZIPCODE^USA
NTE|1||COMMENTS||
SPM|1|^21D:67XXXX&EHR&45DXXXXXXX&CLIA||119339001^STOOL^SCT^STOOL^STOOL/FECES^L||||||||||
||YYYYMMDD|YYYYMMDD|
```

Probe Result:

```
MSH|^~\&#|SENDINGAPP^OID^ISO|SENDING
FACILITY^45DXXXXXXX^CLIA|NEDSS|TX|YYYYMMDD||ORU^R01^ORU_R01|MSG
CONTROL|P|2.5.1|||||USA||||PHLABREPORT-NOACK^ELR_RECEIVER^2.16.840.1.113883.9.11^ISO|
SFT|ORGANIZATIONNAME|VERSIONNUM|SOFTWAREPRODUCTNAME|SOFTWAREBINARYID||YYYYMMDD
PID|1||999999999^^^SENDING FACILITY^45DXXXXXXX^CLIA^MR^SENDING
FACILITY^45DXXXXXXX^CLIA||LAST NAME^FIRST NAME^MIDDLE INITIAL^^^^L||YYYYMMDD|SEX||RACE
CODE^RACE DESCRIPTION^HL70005|STREET
ADDRESS^^LEWISVILLE^TX^ZIPCODE^USA^^^DENTON||^PRN^PH^^^999^9999999|||||||||ETHNICITY
CODE^ETHNICITY DESCRIPTION^HL70189|
ORC|RE||21D:67XXXX^EHR^45DXXXXXXX^CLIA|||||||||ID NUMBER^ORDERING PROVIDER LAST
NAME^PROVIDER FIRST NAME^^^MD^^^^^^^NPI||^^PH^^^999^9999999|||||||ORDERING HOSPITAL
NAME^L^^^^SENDING FACILITY&45DXXXXXXX&CLIA|ORDERING HOSPITAL STREET
ADDRESS^^CITY^STATE^ZIPCODE|^^PH^^^999^9999999|ORDERING PROVIDER STREET
ADDRESS^^CITY^STATE^ZIPCODE|
OBR|1||21D:67XXXX^EHR^45DXXXXXXX^CLIA|21613-5^CHLAMYDIA TRACHOMATIS
PROBE^LN^999^CHLAMYDIA PROBE^L|||YYYYMMDD|YYYYMMDD|||||||||ID NUMBER^ORDERING PROVIDER
LAST NAME^PROVIDER FIRST NAME^^^MD^^^^^^^NPI|^^PH^^^999^9999999|||||YYYYMMDD||LAB|F|
OBX|1|CE|50387-0^CHLAMYDIA TRACHOMATIS RRNA^LN^186134^CHLAMYDIA, NUC. ACID
AMP^L||10828004^POSITIVE^SCT^P^POSITIVE^L||NEGATIVE|A|||F|||YYYYMMDD|||||||||PERFORMING
HOSPITAL NAME^L^^^^^^^^CLIA NO.|PERFORMING FACILITY STREET
ADDRESS^^CITY^STATE^ZIPCODE^USA
NTE|1||COMMENTS||
SPM|1|^21D:67XXXX&EHR&45DXXXXXXX&CLIA||122575003^URINE^SCT||||||||||||YYYYMMDD|YYYYMMDD|
```

Quantifiable Result:

```
MSH|^~\&#|SENDINGAPP^OID^ISO|SENDING
FACILITY^45DXXXXXXX^CLIA|NEDSS|TX|YYYYMMDD||ORU^R01^ORU_R01|MSG
CONTROL|P|2.5.1|||||USA||||PHLABREPORT-NOACK^ELR_RECEIVER^2.16.840.1.113883.9.11^ISO|
SFT|ORGANIZATIONNAME|VERSIONNUM|SOFTWAREPRODUCTNAME|SOFTWAREBINARYID||YYYYMMDD
PID|1||999999999^^^SENDING FACILITY^45DXXXXXXX^CLIA^MR^SENDING
FACILITY^45DXXXXXXX^CLIA||LAST NAME^FIRST NAME^MIDDLE INITIAL^^^^L||YYYYMMDD|SEX||RACE
CODE^RACE DESCRIPTION^HL70005|STREET
ADDRESS^^LEWISVILLE^TX^ZIPCODE^USA^^^DENTON||^PRN^PH^^^999^9999999|||||||||ETHNICITY
CODE^ETHNICITY DESCRIPTION^HL70189|
ORC|RE||21D:67XXXX^EHR^45DXXXXXXX^CLIA|||||||||ID NUMBER^ORDERING PROVIDER LAST
NAME^PROVIDER FIRST NAME^^^MD^^^^^^^NPI||^^PH^^^999^9999999|||||||ORDERING HOSPITAL
NAME^L^^^^SENDING FACILITY&45DXXXXXXX&CLIA|ORDERING HOSPITAL STREET
ADDRESS^^CITY^STATE^ZIPCODE|^^PH^^^999^9999999|ORDERING PROVIDER STREET
ADDRESS^^CITY^STATE^ZIPCODE|
OBR|1||21D:67XXXX^EHR^45DXXXXXXX^CLIA|20416-4^HEPATITIS C VIRUS RNA^LN^140539^HEPATITIS C
QUANTITATION^L|||YYYYMMDD|YYYYMMDD|||||||ID NUMBER^ORDERING PROVIDER LAST NAME^PROVIDER
FIRST NAME^^^MD^^^^^^^NPI|^^PH^^^999^9999999|||||YYYYMMDD||LAB|F|
OBX|1|SN|20416-4^HEPATITIS C VIRUS RNA^LN^140539^HEPATITIS C
QUANTITATION^L||^26000|COPIES/ML|||||F|||YYYYMMDD|||||||||PERFORMING HOSPITAL
NAME^L^^^^^^^^CLIA NO.|PERFORMING FACILITY STREET ADDRESS^^CITY^STATE^ZIPCODE^USA
NTE|1||COMMENTS||
SPM|1|^21D:67XXXX&EHR&45DXXXXXXX&CLIA||SER^SERUM^HL70487||||||||||||YYYYMMDD|
YYYYMMDD|
```

Screening test with titer:

```
MSH|^~\&#|SENDINGAPP^OID^ISO|SENDING
FACILITY^45DXXXXXXX^CLIA|NEDSS|TX|YYYYMMDD||ORU^R01^ORU_R01|MSG
CONTROL|P|2.5.1|||||USA||||PHLABREPORT-NOACK^ELR_RECEIVER^2.16.840.1.113883.9.11^ISO|
SFT|ORGANIZATIONNAME|VERSIONNUM|SOFTWAREPRODUCTNAME|SOFTWAREBINARYID||YYYYMMDD
PID|1||999999999^^^SENDING FACILITY^45DXXXXXXX^CLIA^MR^SENDING
FACILITY^45DXXXXXXX^CLIA||LAST NAME^FIRST NAME^MIDDLE INITIAL^^^^L||YYYYMMDD|SEX||RACE
CODE^RACE DESCRIPTION^HL70005|STREET
ADDRESS^^LEWISVILLE^TX^ZIPCODE^USA^^^DENTON||^PRN^PH^^^999^9999999|||||||||ETHNICITY
CODE^ETHNICITY DESCRIPTION^HL70189|
ORC|RE||21D:67XXXX^EHR^45DXXXXXXX^CLIA|||||||||ID NUMBER^ORDERING PROVIDER LAST
NAME^PROVIDER FIRST NAME^^^MD^^^^^^^NPI||^^PH^^^999^9999999|||||||ORDERING HOSPITAL
NAME^L^^^^SENDING FACILITY&45DXXXXXXX&CLIA|ORDERING HOSPITAL STREET
ADDRESS^^CITY^STATE^ZIPCODE|^^PH^^^999^9999999|ORDERING PROVIDER STREET
ADDRESS^^CITY^STATE^ZIPCODE|
OBR|1||21D:67XXXX^EHR^45DXXXXXXX^CLIA|31147-2^REAGIN AB^LN^00000^RPR,
QUANT^L|||YYYYMMDD|YYYYMMDD|||||||ID NUMBER^ORDERING PROVIDER LAST NAME^PROVIDER FIRST
NAME^^^MD^^^^^^^NPI|^^PH^^^999^9999999|||||YYYYMMDD||LAB|F|
OBX|1|SN|31147-2^REAGIN AB^LN^00000^RPR,
QUANT^L|2|^1^:^4||NONREA<1:1|H|||F|||YYYYMMDD|||||||||PERFORMING HOSPITAL
NAME^L^^^^^^^^CLIA NO.|PERFORMING FACILITY STREET ADDRESS^^CITY^STATE^ZIPCODE^USA
NTE|1||COMMENTS||
SPM|1|^21D:67XXXX&EHR&45DXXXXXXX&CLIA||SER^SERUM^HL70487||||||||||||YYYYMMDD|
YYYYMMDD|
```

XV. Resources

PHIN – Public Health Information Network *http://www.cdc.gov/phin/index.html*

HL7 Data Dictionary - Appendix A, Health Level Seven, Version 2.6 © 2007
http://www.hl7.org/special/committees/vocab/V26_Appendix_A.pdf
HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health (US Realm) Release 1, HL7 Informative Document (February 2010). NOTE: an HL7 account is required to access/download this document.

PHIN Vocabulary and Access Distribution System (VADS) Search Tool
https://phinvads.cdc.gov/vads/SearchHome.action

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

RCMT (Reportable Condition Mapping Table)
http://www.cdc.gov/phin/tools/PHINvads/index.html

LOINC *http://loinc.org*

SNOMED CT Browser
https://browser.ihtsdotools.org/?perspective=full&conceptId1=404684003&edition=MAIN/SNOMEDCT-US/2022-09-01&release=&languages=en

XVI. Contact Information

Public Health Informatics & Data Exchange Group (PHID)
Texas Department of State Health Services
1100 West 49th Street
Austin, Texas 78756

Infectious Disease Informatics (IDI) Team
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https://www.dshs.texas.gov/public-health-informatics-data-exchange-unit-phid

TEXAS
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Texas Department of State Health Services

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