DRAFT HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting To Public Health (US Realm), Release 2 ORU^R01

HL7 version 2.5.1 HL7 Informative Document

<<MONTH>>, <<year>>

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# Introduction

The *HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health (US Realm), Release 1(*ELR251R1) is the public health version of the *HL7 U.S. Realm - Interoperability Specification: Lab Result Message to EHR.*. The use case describes the transmission of laboratory-reportable findings to appropriate local, state, territorial and federal health agencies using the HL7 2.5.1 ORU^R01 message. It includes a reference to batch processing. It does not cover querying patient demographics or querying of laboratory results.

The *DRAFT HL7 Version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health (US Realm), Release2* (ERL251R2*)* is the successor toELR251R1. It is the consolidation of several documents which address numerous issues which arose as ELR251R1 was implemented.An errata and clarifications document was approved by the HL7 Public Health and Emergency Response Work Group (PHER WG) in September of 2011 and published as part of the ELR251R1 IG package. A fully implementable profile document was created through a collaborative effort between APHL’s informatics team and LTIAPH Grantees. The *ELR 2.5.1 Clarification Document for EHR Technology CertificationV1.1*  was created for 2014 EHR certification criteria summarizes conformance statements and condition predicates based upon the release1 IG as well as identifies further clarifications, errata and non-implementable elements. <http://www.cdc.gov/ehrmeaningfuluse/Docs/1ELR251_Clarification_EHR_Tech_Cert_v1_1-20121016.pdf>. In addition, although not approved or published by the PHER WGA. a fully implementable profile document was created through a collaborative between APHL’s informatics teams and several Public Heatlth Jurisdictions.

ELR251R1 included references to other receiver profiles based on the

*HL7 U.S. Realm - Interoperability Specification: Lab Result Message to EHR.*and the NHSN Receiver, which were removed in this R2 document. Conditional usage conventions were adopted from V2.7.1 base standard and alignment to the *HL7 Version 2.5.1 Implementation Guide: S&I Framework Lab Results Interface, Release 1 – US Realm* (LRI DSTU) achieved.

## Purpose

This guide contains the necessary specifications for laboratory results reporting to local, state, territorial and federal health agencies. In particular, this guide addresses messaging content and dynamics related to the transmission of Laboratory Reportable Result Messages. Each state and territory has requirements for laboratories to report certain findings to health officials. In the past, these reports were written by hand on forms provided by health departments and mailed to appropriate offices. With computerization of laboratories, it has become possible for laboratories to send reportable data to health departments electronically. The message described in this guide is not specific to any pathogen or reportable condition and is applicable for most biological and chemistry laboratory-reportable findings

This document is intended to meet the needs and requirements of implementation guidance in Public Health entities, replacing the previous documentation regarding Electronic Laboratory Reporting (ELR). It also contains documentation for a fully constrained implementation profile. However, it does not replace the need for each public health jurisdiction to document the constraints of their specific implementation. Further guidance on how to do this is given in section 1.4.4 Usage Conformance Testing Recommendations below.

## Condition Reporting

Authority to establish a list of reportable conditions and to specify the content of those reports resides with the individual public health jurisdiction. A joint Centers for Disease Control and Prevention (CDC) – Council of State and Territorial Epidemiologists (CSTE) project is underway, which has the goal of creating a national knowledge management system containing this information. For information on current status, email [PHIN@cdc.gov](mailto:PHIN@cdc.gov).

Until the knowledge management system is completed, reporters can access further information about reportable conditions at the website for their own Public Health jurisdiction, or for information on the national defintions, at the CSTE web site:   
<http://www.cste.org/dnn/ProgramsandActivities/PublicHealthInformatics/tabid/346/Default.aspx>

## Audience

This guide is designed for use by analysts and developers who require guidance on data elements and components of the *HL7 Version 2.5.1 ORU Unsolicited Observation Message* relative to the *Public Health Lab Result/ELR Use Case*. Users of this guide must be familiar with the details of HL7 message construction and processing. This guide is not intended to be a tutorial on that subject.

### Requisite Knowledge

* HL7 V2.5.1, V2.7, V2.7.1 Messaging ([www.HL7.org](http://www.HL7.org))
* SNOMED (www. <http://www.ihtsdo.org/snomed-ct>)
* LOINC (<http://loinc.org>)
* UCUM (<http://unitsofmeasure.org>)
* OIDS (<http://www.hl7.org/oid>)
* [Standards and Interoperability Laboratory Results Interface Use Case, *Laboratory Results Reporting to Primary Care Providers (in an Ambulatory Setting) v1.0*](http://sibrowser.siframework.org/siclient/view?type=artifact&id=39481918-9dc7-4f55-aa77-f978b4c13d8b&name=SIFramework_LRI_UC.docx)

## Organization of this Guide

### Conventions

This guide adheres to the following conventions:

* The guide is constructed assuming the implementer has access to the 2.5.1 and 2.7.1 versions of the HL7 Standard. Although some information from the standard is included in this implementation guide, much information from the standard has not been repeated here.
* The rules outlined in *HL7 2.7.1*, *Chapter 2B*, *Section 2B5*, *Conformance Using Message Profiles*, were used to document the use case for, and constraints applied to, the messages described in this guide.
* Data types have been described separately from the fields that use the data types.
* No conformance information is provided for optional message elements (“O”) or unsupported (“X”). This includes cardinality, value sets and descriptive information. Implementers who want to use optional message elements should refer to the base HL7 V2.5.1 Standard to determine how these optional message elements will be used.
* For details regarding data type field lengths, please refer to *Section* , *Lengths*, in this document.
* This guide uses “X” as a conformance usage indicator very sparingly. Where the underlying standard indicates the segments/field/component is present for backwards compatibility (“B”) or withdrawn ("W") an “X” will be used. A small number of other message elements that are clearly out of scope for the use case have been given the "X" usage. All other message elements have either been further constrained to “R”/”RE”/”C(a/b)” or have been marked as "O" to enable trading partners to explore additional capabilities. Labs would have insufficient information to populate these fields and if they would, it could cause potential confusion with information present on the provider's system. Note that without a clearly agreed to complementary profile between trading partners, a Lab does not have to send any elements marked as "O", nor does a receiver of a lab result have to process any elements marked as "O". Neither trading partners can mandate the other to accept any such complementary profiles to enable basic laboratory results interfacing "out-of-the-box".

### Message Element Attributes

The following table describes the various attributes used by this guide to document data type attribute tables, message structure attribute tables and segment attribute tables. Not all attributes apply to all attribute tables.Message Element Attributes

| Table 1‑1. Message Element Attributes | |
| --- | --- |
| Attribute | Definition |
| Seq | Sequence of the elements as numbered in the HL7 message element. The Seq attribute applies to the data type attribute table and the segment attribute table. |
| Segment | Three-character code for the segment and the abstract syntax (*e.g.*, the square and curly braces).  [ XXX ] Optional  { XXX } Repeating  XXX Required  [{ XXX }] Optional and Repeating  Note that for segment groups there is no segment code present, but the square and curly braces will still be present.  The Segment attribute only applies to the Message attribute table. |
| Length | Maximum length of the element. Lengths are provided only for primitive data types.  The length attribute apples to data type attribute tables and segment attribute tables.  Lengths should be considered recommendations, not absolutes. The receiver can truncate fields, components and sub-components that are longer than the recommended length. The receiver should continue to process a message even when a field, component, or sub-component length exceeds the maximum recommended length identified in this specification.  The length attribute may contain a character indicating how the data may be truncated by a receiver. The truncation characters are defined as follows:   * = Truncation not allowed * # Truncation allowed * No character indicates the truncation behavior is not defined. |
| DT | Data type used by this profile for HL7 element.  The data type attribute applies to data type attribute tables and segment attribute tables. |
| Usage | Usage of the message element for this profile. Indicates whether the message element (segment, segment group, field, component, or subcomponent) is R, RE, O, X or C(a/b) in the corresponding message element. Usage applies to the message attribute table, data type attribute table and the segment attribute table, see Section 1.4.4 Usage Conformance Testing Recommendations below. |
| Cardinality | Minimum and maximum number of times the element may appear.  [0..0] Element never present.  [0..1] Element may be omitted and can have, at most, one occurrence.  [1..1] Element must have exactly one occurrence.  [0..n] Element may be omitted or may repeat up to *n* times.  [1..n] Element must appear at least once, and may repeat up to *n* times.  [0..\*] Element may be omitted or repeat an unlimited number of times.  [1..\*] Element must appear at least once, and may repeat unlimited number of times.  [m..n] Element must appear at least *m*, and at most, *n* times.  Cardinality applies only to message attribute tables and segment attribute tables.  See section C.3.2 for additional information on how cardinality is handled in this guide. |
| Value Set | The set of coded values to be used with the field. The value set attribute applies only to the data type attribute tables and the segment attribute tables. The value set may equate with an entire code system part of a code system, or codes drawn from multiple code systems. Constrained tables are included in Section 6.1.1 Constrained HL7 Tables. |
| Name | HL7 descriptor of the message element. Name applies to the message attribute table, data type attribute table and the segment attribute table. |
| Condition Predicate | If the usage code of an element is C, then a conditionality predicate must be associated with this element that identifies the conditions under which the element must be or is allowed to be present. The predicate must be testable and based on other values within the message. This predicate may be expressed as a mathematical expression or in text and may utilize operators such as equivalence, logical AND, logical OR and NOT. The conforming sending and receiving applications shall both evaluate the predicate. When the Usage is not 'C', the conditionality predicate will not be valued.  Unless Otherwise stated it is assumed the Condition Predicate pertains to the PHLabReport Component Profile. |
| Conformance Statement | This may contain formatting markup or added ability to communicate pattern matching and element relationships. These, as well as condition predicate, will allow for formal testable constraints.  **Unless Otherwise stated it is assumed the Conformance Statements pertain to the PHLabReport Component Profile.** |
| Description/Comments | Descriptions and Comments may include:  Definition: An explanation of the meaning of the element.  Implementation Note(s): Implementation Notes provide a general description about how the element is intended to be used, as well as hints on using or interpreting the it.  Example: An example instance  Other Annotation: Additional content related to the element. |

**Note:** In the tables throughout this document, Yellow = This Interoperability Specification does not support the use of this item. This corresponds with the Usage code “X”.

### Keywords

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL** **NOT**", "**SHOULD**", "**SHOULD** **NOT**", "**RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this document are to be interpreted as described in RFC 2119[[1]](#footnote-1). The following definitions are excerpted from the RFC:

**MUST** or the terms "**REQUIRED**" or "**SHALL**", mean that the definition is an absolute requirement of the specification.

**MUST** **NOT** or the phrase "**SHALL NOT**", mean that the definition is an absolute prohibition of the specification.

**SHOULD** or the adjective "**RECOMMENDED**", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.

**SHOULD NOT** or the phrase "**NOT RECOMMENDED**" mean that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.

**MAY** or the adjective "**OPTIONAL**", mean that an item is truly optional. One software supplier may choose to include the item to enable certain capabilities while another software supplier may omit the same item. In either case, the communication partner cannot be expected to either provide it (sender) or process it (receiver) without clear and voluntary agreement between the partners.

An implementation which does not include a particular segment/field/component marked as optional **MUST** be prepared to interoperate with another implementation which does include the optional segment/field/component, though perhaps with reduced functionality. In the same vein an implementation which includes a particular segment/field/component marked as optional **MUST** be prepared to interoperate with another implementation which does not include the optional segment/field/component.

### Usage Conformance Testing Recommendations

The following text is pre-adopted from the HL7 V2.7.1 Conformance (Chapter 2B, 2.B.7.5). Please refer to the base standard documentation for a full explanation of conformance concepts.

*---------- start citation---------*

#### 2.B.7.5 Usage

Message content is governed by the cardinality specification associated (explicitly or implicitly) with each element of an HL7 message. Usage rules govern the expected behavior of the sending application and receiving application with respect to the element. The usage codes expand/clarify the optionality codes defined in the HL7 standard. Usage codes are employed in a message profile to constrain the use of elements defined in the standard. The usage code definitions are given from a sender and receiver perspective and specify implementation and operational requirements.

The standard allows broad flexibility for the message structures that HL7 applications must be able to receive without failing. But while the standard allows that messages may be missing data elements or may contain extra data elements, it should not be inferred from this requirement that such messages are conformant. In fact, the usage codes specified in a message profile place strict conformance requirements on the behavior of the application.

##### Definition of Conditional Usage

The conditional usage is defined as follows:

C(a/b) - “a” and “b” in the expression are placeholders for usage codes representing the true (“a”) predicate outcome and the false (“b”) predicate outcome of the condition. The condition is expressed by a conditional predicate associated with the element (“See section 2.b.7.9, "Condition predicate"). “a” and “b” shall be one of “R”, “RE”, “O” and/or “X”. The values of “a” and “b” can be the same.

The example C(R/RE) is interpreted as follows. If the condition predicate associated with the element is true then the usage for the element is R-Required. If the condition predicate associated with the element is false then the usage for the element is RE-Required but may be empty.

There are cases where it is appropriate to value “a” and “b” the same. For example, the base standard defines the usage of an element as “C” and the condition predicate is dependent on the presence or non-presence of another element. The profile may constrain the element that the condition is dependent on to X; in such a case the condition should always evaluate to false. Therefore, the condition is profiled to C(X/X) since the desired effect is for the element to be not supported. Note it is not appropriate to profile the element to X since this breaks the rules of allowable usage profiling (see table HL7 Optionality and Conformance Usage).

Usage Rules for a Sending Application

| Optionality/Usage Indicator | Description | Implementation Requirement | Operational Requirement |
| --- | --- | --- | --- |
| R | Required | The application shall implement “R” elements. | The application shall populate “R” elements with a non-empty value. |
| RE | Required but may be empty | The application shall implement “RE” elements. | The application shall populate “RE” elements with a non-empty value if there is relevant data. The term “relevant” has a confounding interpretation in this definition[[2]](#footnote-2). |
| C(a/b) | Conditional | An element with a conditional usage code has an associated condition predicate (See section 2.B.7.9, “Condition predicate” that determines the operational requirements (usage code) of the element.  **If the condition predicate associated with the element is true, follow the rules for *a* which shall be one of “R”, “RE”, “O” or X”:**  **If the condition predicate associated with the element is false, follow the rules for *b* which shall be one of “R”, “RE”, “O” or X”**.  ***a*** and ***b*** can be valued the same. | |
| X | Not supported | The application (or as configured) shall not implement “X” elements. | The application shall not populate “X” elements. |
| O | Optional | None. The usage indicator for this element has not yet been defined. For an implementation profile all optional elements must be profiled to R, RE, C(a/b), or X. | Not Applicable. |

Usage Rules for a Receiving Application

| Optionality/Usage Indicator | Description | Implementation Requirement | Operational Requirement |
| --- | --- | --- | --- |
| R | Required | The application shall implement “R” elements. | The receiving application shall process (save/print/archive/etc.) the information conveyed by a required element.  A receiving application shall raise an exception due to the absence of a required element. A receiving application shall not raise an error due to the presence of a required element, |
| RE | Required but may be empty | The application shall implement “RE” elements. | The receiving application shall process (save/print/archive/etc.) the information conveyed by a required but may be empty element. The receiving application shall process the message if the element is omitted (that is, an exception shall not be raised because the element is missing). |
| C(a/b) | Conditional | The usage code has an associated condition predicate true (See section 2.B.7.9, “Condition predicate").  **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 | The application (or configured) shall not implement “X” elements. | None, if the element is not sent.  If the element is sent the receiving application may process the message, shall ignore the element, and may raise an exception. The receiving application shall not process (save/print/archive/etc.) the information conveyed by a not-supported element. |
| O | Optional | None. The usage indicator for this element has not yet been defined. For an implementation profile all optional elements must be profiled to R, RE, C(a/b), or X. | None. |

*--------- end citation ---------*

## Scope

The use case describes the transmission of laboratory-reportable findings to appropriate local, state, territorial and federal health agencies using the HL7 2.5.1 ORU^R01 message.

*In Scope*

* Defining the core data elements required for electronic laboratory reporting of reportable laboratory test results to Public Health.
* Reporting of clinical laboratory test results to public health in the US Realm.
* Sending laboratory test results as standardized structured data so they can be incorporated that way into a Public Health Disease Surveillance System.
* Supporting Stage 3 certification criteria and Meaningful Use (MU).
* Reporting laboratory test results for an order that was placed either manually or electronically.
* Harmonization of data elements that are used in both laboratory orders and results.
* Covering all CLIA reporting requirements.
* Receiving of laboratory results as a non-order placer.
* Batch processing
* Laboratory results for individual living subjects (persons and animals).

*Out of Scope*

* Specifications and implementation guidance on laboratory ordering transactions. However, the establishment of requirements in the laboratory result message that will allow the matching of the reported result to an existing order initiated from the ordering clinician’s EHR-S is within the scope of this effort.
* Reporting of results from laboratory to laboratory.
* Querying for laboratory results.
* Querying for historical laboratory results.
* Receiving historical laboratory results.
* Querying patient demographics
* Advanced error messages related to application transport.
* Results not transmitted using a standardized structured format.
* Reporting of laboratory results from one public health jurisdictional entity to another.
* Situation where public health is the originator of the order for testing
* The use case for public health laboratory test orders and reporting of related results
* Reporting of results to Cancer Registries
* Results from nonliving subjects (water, food, air)

## Use Case and Context Diagrams

The *Public Health Laboratory Messaging Use Case* focuses on the use case describing the transmission of laboratory-reportable findings to appropriate local, state, territorial, and federal health agencies using the *HL7 2.5.1* ORU message. It includes optional acknowledgments of receipt of transactions. The use case does allow the optional use of batch processing to transmit results. The goal of the use case is to provide safe, reliable delivery of reportable laboratory results to public health. If PHIN MS is used for transport, then use of the HL7 Acknowledgments may be un-necessary, although PHIN MS does not ensure that the payload conforms to HL7 formatting rules, it does provide safe and reliable transport.

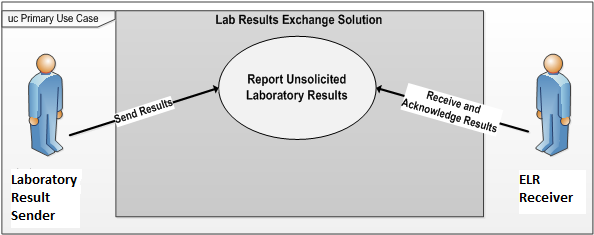


Figure 1. Use Case Diagram

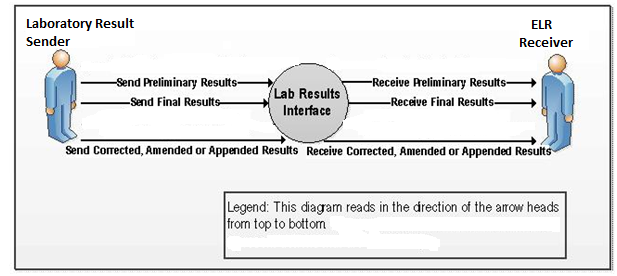


Figure 2. Context Diagram

## ACTORS

The Use Case Model has two primary participating actors, the Laboratory Result Sender and the ELR Receiver.

**Laboratory Result Sender** – The laboratory result sender actor is an application capable of transmitting the results of laboratory testing on specimens. This may be the laboratory itself or some aggregator of laboratory result data. The laboratory result sender application is capable of transmitting the results of laboratory testing to a receiver, optionally capable of batching result messages and optionally capable of receiving HL7 acknowledgments. If the Laboratory Result Sender is an actual laboratory system, it is often referred to as “Filler.”  
The Laboratory Result Sender application is an HL7 Application as defined by HL7 Version 3 Standard: Abstract Transport Specification, Normative Edition 2009. One point of confusion is what role data aggregators play in this use case. In typical circumstances, a data aggregator is considered an HL7 Application, and as such directly takes on the role of Laboratory Result Sender for this use case. The HL7 Version 3 Standard: Abstract Transport Specification, Normative Edition 2009 also describes several roles typically played by interface engines, include gateway, bridge and intermediary roles. The abstract transport specification considers the gateway role to be an HL7 Application, so for this use case an interface engine playing the gateway role and originating the transaction in this IG would be a Laboratory Result Sender actor.

**ELR Receiver** – The laboratory result receiver is an application capable of receiving results of laboratory testing, optionally transmitting an acknowledgment and optionally capable of receiving a batch of laboratory results. The laboratory result receiver may be associated with the local, state, territorial and federal health agencies that require access to the results. Note that the Laboratory Result Receiver should not be confused with the “Placer” of the laboratory order that the laboratory results are associated. The placer of the order is typically a provider who is responsible for treating the patient. In this case, the Laboratory Result Receiver is an interested party who receives a copy of the results

These two actors have responsibilities related to the conformance profiles defined in this document

* Laboratory Result Sender – A sender of laboratory result messages that declares conformance to a profile defined in this guide.
* ELR Receiver – A receiver of laboratory result messages that declares conformance to a profile defined in this guide.

## Use Case Assumptions

The following assumptions are preconditions for the use of this profile:

Each public health jurisdictional entity has previously defined the reportable conditions appropriate to its jurisdiction.

Laboratory result senders are responsible for the setup of their system with the reportable conditions appropriate to its jurisdiction.

## SEquence Diagrams

The Figures below show the interactions between the Lab Results Sender and the ELR Receiver in the order that they occur. The horizontal lines are used to identify the specific activity between the systems. The solid lines represent the data being transmitted using an HL7 message. Each step has a number associated with it to emphasize the order of the events. Internal Lab system functions (retry, next and log options) are shown as closed loops on the side of the Lab Results Sender.

### Sequence Diagram for Laboratory Result with Acknowledgement

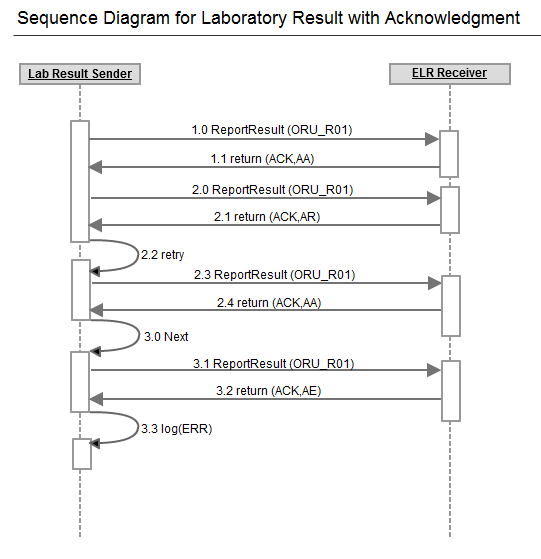


Figure 3. Sequence Diagram for Laboratory Result with Acknowledgment

The sequence begins with the Lab Results Sender transmitting an ELR ORU\_R01 message to the ELR Receiver (1.0) which is positively acknowledged (AA or CA) by the ELR Receiver (1.1). A subsequent results transaction (2.0) is rejected (AR or CR) through an acknowledgement transaction (2.1) that leads the Lab to fix the problem and retry (2.2). The resulting transaction (2.3) is acknowledged as correct (2.5). The third result transaction (3.1) contains serious errors (AE or CE) resulting in an error message (3.2) being returned to the Lab system which then logs the error(3.3).

### Sequence Diagram for Laboratory Result without Acknowledgement

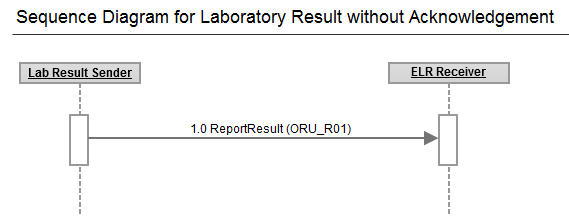


Figure 4. Sequence Diagram for Laboratory Result without Acknowledgment

The sequence consists of Lab Results Sender transmitting an ELR ORU\_R01 message to the ELR Receiver (1.0). No acknowledgement is sent by the ELR Receiver. The reader is directed to HL7 Version 2.7.1, Chapter 2 Section 2.10.3 *HL7 batch protocol* for further guidance

### Sequence Diagram for Batch Processing of Laboratory Result without Acknowledgements

### 

Figure 5. Sequence Diagram for Batch Processing of Laboratory Result without Acknowledgements

The sequence consists of Lab Results Sender transmitting an zero or more ELR ORU\_R01 message using the batch protocol to the ELR Receiver (1.0). No acknowledgement is sent by the ELR Receiver.

### Interactions

| Table 1‑2 Interactions  Individual Transaction with Acknowledgements (Ack),  Individual Transaction without Acknowledgements (NoAck),  Individual Transaction without Acknowledgements/Batch (Batch) | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Event | Description | Use Case | Message Type | Receiver Action | Sender | Data Values |
| Preliminary Result | Preliminary: A verified early result is available; final results not yet obtained | Ack[[3]](#footnote-3)  NoAck3  Batch | ORU^R01^ORU\_R01 | Commit Accept, Commit Reject or Commit Error | Laboratory Result Sender | ORC-1=RE  OBR-25=P |
| Final Result | Final results; results stored and verified. Can be changed only with a corrected result. | Ack  NoAck  Batch | ORU^R01^ORU\_R01 | Commit Accept, Commit Reject or Commit Error | Laboratory Result Sender | ORC-1=RE  OBR-25=F |
| Correction | Correction to results | Ack  NoAck  Batch | ORU^R01^ORU\_R01 | Commit Accept, Commit Reject or Commit Error | Laboratory Result Sender | ORC-1=RE  OBR-25=C |
| No Results Available | No results available; Order canceled, Testing Not Done | Ack  NoAck  Batche | ORU^R01^ORU\_R01 | Commit Accept, Commit Reject or Commit Error | Laboratory Result Sender | ORC-1=RE  OBR-25=X |
| Commit/Application Accept | Accept acknowledgment/ Application Accept/ Application acknowledgment | Ack | ACK^R01^ACK | None | ELR Receiver | MSA-1=CA/AA |
| Commit/Application Error | Accept acknowledgment:/ Application Error/ Application acknowledgment:  Error | Ack | ACK^R01^ACK | None | ELR Receiver | MSA-1=CE/AE |
| Commit/Application Reject | Accept acknowledgment/ Application Reject/Application acknowledgment:  Reject | Ack | ACK^R01^ACK | None | ELR Receiver | MSA-1=CR/AR |

## key TEchnical Decisions

One of the primary features of this implementation guide is its focus on broad interoperability

### Use of ISO Object Identifier (OID)

OIDs, or Object Identifiers, provide a strong identifier that uniquely identifies the object in question and is global in scope. Examples of information that OIDs can identify are items about patients, orders, providers and organizations. This means the identifier includes enough information to remain unique when taken out of the context within which the identifier was created. The ISO OID specification (ISO/IEC 8824:1990(E)) is the globally accepted technology for this purpose and is recommended as the means to satisfy the requirement for a universally unique identifier.

HL7 has ***published HL7 Implementation Guidance for Unique Object Identifiers, Release 1*** [[4]](#footnote-4) to provide guidance on how organizations can manage OIDs.

### Use of Vocabulary Standards ­

This guide calls for specific vocabulary standards for the exchange of laboratory information. Use of standard vocabularies is important for a number of reasons not the least of which is semantic interoperability, the ability for a computer to understand and process exchanged data. Use of standard vocabularies allows broad distribution of healthcare information without the need for individual institutions to exchange master files for data such as test codes, result codes, etc. Each institution maps its own local vocabularies to the standard code, allowing information to be shared broadly, rather than remaining isolated as a single island of information. Standard vocabularies, particularly coded laboratory tests using LOINC and coded results using

SNOMED CT enables more automated decision support for patient healthcare, as well as more automated public health surveillance of populations.

### Snapshot Mode

Result messages shall always be sent in snapshot mode, meaning that all information related to the smallest individually identifiable unit are complete. For this message type that would be the OBR and all related segments (OBX, NTE and SPM, OBX). I.e., if a correction and/or status update to at least one of the OBX segments under one OBR is necessary, all OBX segments, even if previously sent, shall be resent with the correction and/or current status and/or current values. For example, in the case of a co-infection when a Culture is ordered, the preliminary results of the culture (isolation and identification) may be released if one organism is identified but the results of the second is pending. At a later time the second organism is identified and released. Snapshot reporting will send all previous results as well as the new results, in this case the identification of both organisms.

### Lengths

In *HL7 Version 2.5*, HL7 assigned lengths to the components of data types, but did not standardize the lengths of the fields that use those data types. This guide pre-adopts the length rules from *HL7 Version 2.7.1*: Starting with v2.7, HL7 allows documentation of both a minimum and maximum length for an element.

In *HL7 Version 2.7*.*1* length is specified for primitive data types (i.e., those without components). Length is not specified for composite elements. For composite data types, the actual minimum and maximum lengths can be very difficult to determine due to the interdependencies on the component content, and the specification of actual lengths is not useful either. In general, this guide will adopt lengths from *HL7 Version 2.7.1*

The concept of truncation is being pre-adopted from HL7 Version 2.7.1 as well, but only in regards to length documentation. The transmission of the truncation character in message data is not being pre-adopted.

Note: In HL7 Version 2.5.1, the length of 65536 has a special meaning: For HL7, "If the maximum length needs to convey the notion of a Very Large Number, the number 65536 should be displayed to alert the user."  
In this implementation guide, fields or components with length 65536 should be understood as having no prescribed length. Receivers should be prepared to accept any size chunk of data carried in the field or component*.*

### Use Of Escape Sequences In Text Fields

Senders and receivers using the ELR profile shall handle escape sequence processing as described in *HL7 Version 2.5.1*, *Chapter 2, Section 2.7.4 (Special Characters*). This requirement applies to the ST, TX and FT data types. Implementers shall not support escape sequences described in *Sections 2.7.2 (Escape sequences supporting multiple character sets), 2.7.3 (Highlighting), 2.7.5 (Hexadecimal), 2.7.6 (Formatted Text)* and *2.7.7 (Local).* This restriction applies to the TX and FT data types.

### comment

## Referenced Profiles - Antecedents

The following profile was used as source materials in the development of this guide:

1. *HL7 U.S. Realm – Interoperability Specification: Lab Result Message to EHR, Version 1.0,* November 2007
2. *Harmonized Use Case for Electronic Health Records (Laboratory Result Reporting)*
3. *Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Information using version 2.3.1 of Health Level Seven (HL7) Standard Protocol,* March 2005*.*
4. *HL7 Version 3 Standard: Abstract Transport Specification, Normative Edition 2009*
5. *HL7 Version 2.5.1 Implementation Guide: Laboratory Results Interface for US Realm, Release 1,v49, HL7 Version 2.5.1: ORU^R01, Draft Standard for Trial Use, July 2012*
6. [Standards and Interoperability Laboratory Results Interface Use Case, *Laboratory Results Reporting to Primary Care Providers (in an Ambulatory Setting) v1.0*](http://sibrowser.siframework.org/siclient/view?type=artifact&id=39481918-9dc7-4f55-aa77-f978b4c13d8b&name=SIFramework_LRI_UC.docx)

## Conformance to this Guide

This implementation guide defines components that are combined into profiles to define specific conformance requirements.

The Components must be combined to create a valid Profile for a particular transaction. As of this version a valid profile consists of a minimum of a single component:

1. PHLabReport.

Additional components can be provided to further define the message structure and use. This guide defines seeven such components:

1. PHLabReport-Ack – Acknowledgement required
2. PHLabReport-Batch - Batch message protocol required
3. PHLabReport-XO - Exclusions
4. PHLabReport-CO – Code Order
5. PHLabReport-SCTO– SNOMED CT Only
6. PHLabReport-NoCE – CE not supported
7. PHLabReport-NoNM – SN Only for OBX.5

MSH-21 (Message Profile Identifier) is populated with the profile identifiers. Multiple profiles or component profiles can be present in MSH.21 provided the combination of profiles do not conflict with each other. Additional definitions and guidance for MSH-21 can be found in Section 3.3.1 MSH – Message Header Segment.

### Results Profile Components

Note: OIDs will be updated once comment resolution is completed

#### PHLabReport – ID: 2.16.840.1.113883.9.NNN

This message profile component indicates that the message adheres to the rules set out in this implementation guide for the results message use case described above where acknowledgements are not used This component sets the minimum constraints on the base specification for all profiles defined by this guide and may be further constrained by additional components.

#### PHLabReport-Ack -ID: 2.16.840.1.113883.9.NNN

The combination of this message profile component and the PHLabReport component profile adheres to the rules set out in this implementation guide for the results message use case described above where acknowledgements are required.

Support for this profile component is optional.

#### PHLabReport-XO - ID: 2.16.840.1.113883.9.NNN

One of the basic premises of this guide is to enable senders to compose transactions that may satisfy multiple purposes, e.g., multiple implementation guides that share the same required fields and vocabulary. They therefore may populate any of the fields/components marked O (optional). At the same time this implementation guide wants to expressly reinforce that if data is sent in optional fields/segments, the receiver can completely ignore those. Therefore, the usage code X is used sparingly, while the usage code O is mostly used when the field/component is not necessary for the use case at hand. The rationale is that according to the definition of X per the base standard is "For conformant sending applications, the element shall not be sent. Conformant receiving applications may ignore the element if it is sent, or may raise an application error."

However to accommodate those implementations where the population of any optional fields remaining is not desirable, the PHLabReport-XO component is defined to indicate that all of the remaining optional segments and fields that are marked O (Undefine) are now considered to be marked with an X (Not Supported). Its use yields, in combination with the other profile components, a fully implementable profile in accordance with Chapter 2B.

**ELR-NN:** If an occurrence of MSH-21 is valued 2.16.840.1.113883.9.NNN (PHLabReport-XO), the O (Undefined) Usage attribute SHALL follow the Usage Rules for the X (Not Supported) Usage attribute.

Support for this profile component is optional.

#### PHLabReport-CO - ID: 2.16.840.1.113883.9.NNN

For all the CWE data types, the standard code always populates the first triplet and the local code always populates the second triplet. Refer to Section 7.7 for when no standard code exists for the CWE data types.

Support for this profile component is optional.

#### PHLabReport-SCTO- ID:2.16.840.1.113883.9.NNN

#### Specimen Type Value Set is limited to SNOMED CT Specimen sub-tree, and the Specimen Collection Method is limited to the SNOMED CT Specimen Collection (17636008) sub-tree.

Support for this profile component is optional.

#### PHLabReport-NoCE - ID:2.16.840.1.113883.9.NNN

CE datatypes are not supported in OBX.5 (further constraint of table 0125). When reporting coded results, use CWE - Coded with Exceptions datatype instead of CE -Coded Element datatype.

Support for this profile component is optional.

#### PHLabReport-NoNM – ID:2.16.840.1.113883.9.NNN

NM datatypes are not supported in OBX.5 (further constraint of table 0125). When reporting quantitative (numeric) results in OBX.5, use the SN - Structured Numeric data type instead of the NM – Numeric data type.

Support for this profile component is optional.

### Optional LRI component profile for use with the LRI results message.

#### LRI\_PH\_COMPONENT – ID: 2.16.840.1.113883.9.NNN

When a laboratory result is sent to public health, additional data is required to be sent along in the result message when compared to the LRI use case. This Profile component is used to identify those fields that are to be considered for Public Health according to condition predicates and conformance statements referencing this profile component.

To use LRI implementation guide to send a conformant ELR251 R2 message that is equivalent to the PHLabReport -ID 2.16.840.1.113883.9.NNN + PHLabReport -Ack -ID: 2.16.840.1.113883.9.NNN message profile, the LRI result components in MSH.21 SHALL be:

**LRI\_GU\_RU\_Profile ID: 2.16.840.1.113883.9.17 + Component profile, LRI\_PH\_COMPONENT – ID:2.16.840.1.113883.9.NNN**

In the context of the LRI guide, support for this component is optional. However it is required to send a conformant ELR message to an ELR receiver.

See Appendix C for a detail discussion of the additional data that is required beyond the LRI\_GU\_RU profile.

### Response Profiles

Note: OIDs will be updated once comment resolution is completed

This Guide defines one base ELR 251 R2 acknowledgement response profile.

#### PHReturnAck – ID: 2.16.840.1.113883.9.NNN

This message profile indicates that the acknowledgement message adheres to the rules set out in this implementation guide











# Data types

Note numbering for conformance statements will be updated once the comment resolution is completed

The following sections detail the structure of each datatype, including segment name, usage, cardinality and description. See section 1.4.1 (Message Element Attributes) for a description of the columns in the Abstract Message Syntax Tables. Note: Unless otherwise stated in table it is assumed the Condition Predicate and Conformance statements pertains to the PHLabReport Component Profile. The reader is referred to Sections 1.12 above regarding the Component Profiles.

Documents what data types are used within profile. Refer to the HL7 2.5.1 base standard for any/all datatypes used but not described in this guide.

Types

| Table 2‑1. Datatypes | |
| --- | --- |
| Data type | Data Type Name |
| CE | Coded element |
| CNN | Composite ID Number and Name Simplified |
| CQ | Composite Quantity with Units |
| CWE | Coded with Exceptions |
| CX | Extended Composite ID with Check Digit |
| DR | Date/Time Range |
| DT | Date |
| DTM | Date/Time |
| ED | Encapsulated Data |
| EI | Entity Identifier |
| EIP | Entity Identifier Pair |
| FN | Family Name |
| FT | Formatted Text Data |
| HD | Hierarchic Designator |
| ID | Coded Values for HL7 Tables |
| IS | Coded value for User-Defined Tables |
| MSG | Message Type |
| NDL | Name with Date and Location |
| NM | Numeric |
| PRL | Parent Result Link |
| PT | Processing Type |
| RP | Reference Pointer |
| SAD | Street Address |
| SI | Sequence ID |
| SN | Structured Numeric |
| ST | String |
| TM | Time |
| TS | Time Stamp |
| TX | Text Data |
| VID | Version Identifier |
| XAD | Extended Address |
| XCN | Extended Composite ID Number and Name |
| XON | Extended Composite Name and ID Number for Organizations |
| XPN | Extended Person Name |
| XTN | Extended telecommunications number |

## CE – Coded Element

Note: Unless otherwise stated in table it is assumed the Condition Predicate and Conformance statements pertains to the PHLabReport Component Profile. The reader is referred to Sections above regarding the Column definitions and Conformance Profiles.

| Table 2‑2. CE – Coded Element | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Comments |
| 1 | 1..20= | ST | R |  | Identifier |  |  |
| 2 | 1..199# | ST | RE |  | Text |  | It is strongly recommended that text be sent to accompany any identifier. When a coded value is not known, text can still be sent, in which case no coding system should be identified. |
| 3 | 1..12 | ID | R | HL70396 | Name of Coding System |  |  |
| 4 | 1..20= | ST | RE |  | Alternate Identifier |  | The alternate identifier (from the alternate coding system) should be the closest match for the identifier found in component 1. |
| 5 | 1..199# | ST | RE |  | Alternate Text |  | It is strongly recommended that alternate text be sent to accompany any alternate identifier. |
| 6 | 1..12 | ID | C(R/X) | HL70396 | Name of Alternate Coding System | Condition Predicate: If CE.4 (Alternate Identifier) is valued |  |

## CNN – Composite ID Number and Name Simplified

| Table 2‑3. CNN – Composite ID Number and Name Simplified | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Conformance Statement | Comments |
| 1 | 1..15= | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html" \l "ST) | RE |  | ID Number |  |  | The ID Number component combined with the Assigning Authority – Universal ID component (component 10) must uniquely identify the associated person. Note - despite the component being named “ID Number” this component is an ST string data type, not numeric, so the component is not limited to just numbers. |
| 2 | 1..50# | ST | RE |  | Family Name |  |  |  |
| 3 | 1..30# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html" \l "ST) | RE |  | Given Name |  |  | I.e., first name. |
| 4 | 1..30# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html" \l "ST) | RE |  | Second and Further Given Names or Initials Thereof |  |  |  |
| 5 | 1..20# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html" \l "ST) | RE |  | Suffix (e.g., JR or III) |  |  |  |
| 6 | 1..20# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html" \l "ST) | RE |  | Prefix (e.g., DR) |  |  |  |
| 7 | 1..5= | [IS](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html" \l "IS) | RE | HL70360 | Degree (e.g., MD) |  |  | Guidance: LEN may need to be expanded upon implementation to accommodate all values. |
| 8 |  |  | X |  |  |  |  | Not supported. |
| 9 | 1..20= | IS | RE | Local | Assigning Authority – Namespace ID |  |  | The coding system for this component is locally managed. |
| 10 | 1..199= | ST | C(R/X) |  | Assigning Authority - Universal ID | If CNN.1 (Identifier) is valued. | **ELR-002:** CNN.10 (Assigning Authority - Universal ID) SHALL be valued with an ISO-compliant OID. |  |
| 11 | 1..6 | ID | C(R/X) | HL70301 | Assigning Authority - Universal ID Type | If CNN.10 (Assigning Authority - Universal ID) is valued. | **ELR-003:** CNN.11 (Assigning Authority - Universal ID Type) SHALL contain the value "ISO". |  |

## CQ – Composite Quantity with Units

| Table 2‑4 CQ - Composite Quantity with Units | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 |  | NM | R |  | Quantity |  |
| 2 |  | CWE | RE | Unified Code for Units of Measure (UCUM) | Units | Units of measure must be drawn from the UCUM coding system. |

## CWE\_CRE – Coded with Exceptions – Code Required, but May Be Empty

Note: This guide pre-adopts the structure of the CWE data type from *HL7 Version 2.7. 1*

| Table 2‑5. CWE\_CRE – Coded with Exceptions | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Conformance Statement | Comments |
| 1 | 1..20= | ST | RE |  | Identifier |  |  |  |
| 2 | 1..199# | ST | C(RE/X) |  | Text | If CWE.1 (Identifier) is valued. |  | It is strongly recommended that text be sent to accompany any identifier. When a coded value is not known, the original text attribute is used to carry the text, not the text component. |
| 3 | 1..12 | ID | C(R/X) | HL70396 | Name of Coding System | If CWE.1 (Identifier) is valued. | . | See section for description of the use of coding systems in this implementation guide. |
| 4 | 1..20= | ST | RE |  | Alternate Identifier |  |  | The alternate identifier (from the alternate coding system) should be the closest match for the identifier found in component 1. |
| 5 | 1..199# | ST | C(RE/X) |  | Alternate Text | If CWE.4 (Identifier) is valued. |  | It is strongly recommended that alternate text be sent to accompany any alternate identifier. |
| 6 | 1..12 | ID | C(R/X) | HL70396 | Name of Alternate Coding System | If CWE.4 (Identifier) is valued. |  | See section for description of the use of coding systems in this implementation guide. |
| 7 | 1..10= | ST | RE |  | Coding System Version ID |  |  | The format for the version ID is determined by the coding system being used. The length has been increased to handle longer versioning strings. |
| 8 | 1..10= | ST | RE |  | Alternate Coding System Version ID |  |  | However, the particular coding system indicates versioning should be handled will be appropriate here. The length has been increased to handle longer versioning strings. |
| 9 | 1..199# | ST | C(R/RE) |  | Original Text | If CWE\_CRE.1 (Identifier) AND CWE\_CRE.4 (alternate identifier) are not valued. |  | Either original Text is used to convey the text that was the basis for coding, or when there is no code to be sent, only free text. |
| 10 |  |  | O |  | Second Alternate Identifier |  |  |  |
| 11 |  |  | O |  | Second Alternate Text |  |  |  |
| 12 |  |  | O |  | Second Name of Alternate Coding System |  |  |  |
| 13 |  |  | O |  | Second Alternate Coding System Version ID |  |  |  |
| 14 |  |  | O |  | Coding System OID |  |  |  |
| 15 |  |  | X |  | Value Set OID |  |  | Not supported. |
| 16 |  |  | X |  | Value Set Version ID |  |  | Not supported. |
| 17 |  |  | X |  | Alternate Coding System OID |  |  | Not supported. |
| 18 |  |  | X |  | Alternate Value Set OID |  |  | Not supported. |
| 19 |  |  | X |  | Alternate Value Set Version ID |  |  | Not supported. |
| 20 |  |  | X |  | Second Alternate Coding System OID |  |  | Not supported. |
| 21 |  |  | X |  | Second Alternate Value Set OID |  |  | Not supported. |
| 22 |  |  | X |  | Second Alternate Value Set Version ID |  |  | Not supported. |

Usage note: This version of the CWE is used with all CWE elements except OBR-4, OBX-3 and OBX-5. The CWE\_CRE data type is used where it is necessary to communicate a code, text, coding system and the version of coding system the code was drawn from. It also allows the communication of an alternate code drawn from another coding system. Many coded fields in this specification identify coding systems or value sets that must be used for the field. **When populating the CWE data types with these values, this guide does not give preference to the triplet in which the standard code should appear.** The receiver is expected to examine the coding system names in components 3 and 6 to determine if it recognizes the coding system.

The CWE data type allows communication CWE Statuses that indicate whether the value is known or not, not applicable, or not available (HL7 Table 0353-CWE Status Codes). The full set of allowable values and its use is described in Chapter 2A, Section 2.A.13 under Data Missing. This will be allowed for all uses of CWE\_CRE~~, except in SPM-4~~.

## CWE\_CR – Coded with Exceptions – Code Required

Note: This guide pre-adopts the structure of the CWE data type from *HL7 Version 2.7. 1*

| Table 2‑6. CWE\_CR – Coded with Exceptions | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Conformance Statement | Comments |
| 1 | 1..20= | ST | R |  | Identifier |  | **ELR-NNN:** CWE.CR.1 (Identifier) If CWE.CR..6 (Name of Coding System) value is "LN", SHALL be a valid LOINC code identifier format. | ELR Note: The identifier component is always required. |
| 2 | 1..199# | ST | RE |  | Text |  |  | It is strongly recommended that text be sent to accompany any identifier. When a coded value is not known, the original text attribute is used to carry the text, not the text component. |
| 3 | 1..12 | ID | R | HL70396 | Name of Coding System |  |  | See section for a description of the use of coding systems in this implementation guide. |
| 4 | 1..20= | ST | RE |  | Alternate Identifier |  | **ELR-NNN:** CWE.CR..4 (Alternate Identifier) If CWE.CR..6 (Name of AlternateCoding System) value is "LN", SHALL be a valid LOINC code identifier format. | The alternate identifier (from the alternate coding system) should be the closest match for the identifier found in component 1. |
| 5 | 1..199# | ST | RE |  | Alternate Text |  |  | It is strongly recommended that alternate text be sent to accompany any alternate identifier. |
| 6 | 1..12 | ID | C(R/X) | HL70396 | Name of Alternate Coding System | IF CWE.4 (Identifier) is valued. |  | See section for description of the use of coding systems in this implementation guide. |
| 7 | 1..10= | ST | RE |  | Coding System Version ID |  |  | However, the particular coding system indicates versioning should be handled will be appropriate here. |
| 8 | 1..10= | ST | RE |  | Alternate Coding System Version ID |  |  | However, the particular coding system indicates versioning should be handled will be appropriate here. |
| 9 | 1..199# | ST | RE |  | Original Text |  |  | Original Text is used to convey the text that was the basis for coding. |
| 10 |  |  | O |  | Second Alternate Identifier |  |  |  |
| 11 |  |  | O |  | Second Alternate Text |  |  |  |
| 12 |  |  | O |  | Second Name of Alternate Coding System |  |  |  |
| 13 |  |  | O |  | Second Alternate Coding System Version ID |  |  |  |
| 14 |  |  | O |  | Coding System OID |  |  |  |
| 15 |  |  | X |  | Value Set OID |  |  | Not supported. |
| 16 |  |  | X |  | Value Set Version ID |  |  | Not supported. |
| 17 |  |  | X |  | Alternate Coding System OID |  |  | Not supported. |
| 18 |  |  | X |  | Alternate Value Set OID |  |  | Not supported. |
| 19 |  |  | X |  | Alternate Value Set Version ID |  |  | Not supported. |
| 20 |  |  | X |  | Second Alternate Coding System OID |  |  | Not supported. |
| 21 |  |  | X |  | Second Alternate Value Set OID |  |  | Not supported. |
| 22 |  |  | X |  | Second Alternate Value Set Version ID |  |  | Not supported. |

Implementation Note This version of the CWE is used only with OBR-4 and OBX-3. The CWE data type is used where it is necessary to communicate a code, text, coding system and the version of coding system the code was drawn from. It also allows the communication of an alternate code drawn from another coding system. Many coded fields in this specification identify coding systems or value sets that must be used for the field. **When populating the CWE data types with these values, this guide does not give preference to the triplet in which the standard code should appear.** The receiver is expected to examine the coding system names in components 3 and 6 to determine if it recognizes the coding system.

The CWE data type allows communication CWE Statuses that indicate whether the value is known or not, not applicable, or not available (HL7 Table 0353-CWE Status Codes). The full set of allowable values and its use is described in Chapter 2A, Section 2.A.13 under Data Missing. This will be allowed for all uses of CWE\_CR..

## CWE\_CRO – Coded with Exceptions – Code and Original Text Required

Note: This guide pre-adopts the structure of the CWE data type from *HL7 Version 2.7.1*

| Table 2‑7. CWE\_CR – Coded with Exceptions | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Comments |
| 1 | 1..20= | ST | R |  | Identifier |  | ELR Note: The identifier component is always required. |
| 2 | 1..199# | ST | RE |  | Text |  | It is strongly recommended that text be sent to accompany any identifier. When a coded value is not known, the original text attribute is used to carry the text, not the text component. |
| 3 | 1..12 | ID | R | HL70396 | Name of Coding System |  | See section for a description of the use of coding systems in this implementation guide. |
| 4 | 1..20= | ST | RE |  | Alternate Identifier |  | The alternate identifier (from the alternate coding system) should be the closest match for the identifier found in component 1. |
| 5 | 1..199# | ST | RE |  | Alternate Text |  | It is strongly recommended that alternate text be sent to accompany any alternate identifier. |
| 6 | 1..12 | ID | C(R/X) | HL70396 | Name of Alternate Coding System | IF CWE.4 (Identifier) is valued. | See section for description of the use of coding systems in this implementation guide. |
| 7 | 1..10= | ST | RE |  | Coding System Version ID |  | However, the particular coding system indicates versioning should be handled will be appropriate here. |
| 8 | 1..10= | ST | RE |  | Alternate Coding System Version ID |  | However, the particular coding system indicates versioning should be handled will be appropriate here. |
| 9 | 1..199# | ST | R |  | Original Text |  | Original Text is used to convey the text that was the basis for coding. |
| 10 |  |  | O |  | Second Alternate Identifier |  |  |
| 11 |  |  | O |  | Second Alternate Text |  |  |
| 12 |  |  | O |  | Second Name of Alternate Coding System |  |  |
| 13 |  |  | O |  | Second Alternate Coding System Version ID |  |  |
| 14 |  |  | O |  | Coding System OID |  |  |
| 15 |  |  | X |  | Value Set OID |  | Not supported. |
| 16 |  |  | X |  | Value Set Version ID |  | Not supported. |
| 17 |  |  | X |  | Alternate Coding System OID |  | Not supported. |
| 18 |  |  | X |  | Alternate Value Set OID |  | Not supported. |
| 19 |  |  | X |  | Alternate Value Set Version ID |  | Not supported. |
| 20 |  |  | X |  | Second Alternate Coding System OID |  | Not supported. |
| 21 |  |  | X |  | Second Alternate Value Set OID |  | Not supported. |
| 22 |  |  | X |  | Second Alternate Value Set Version ID |  | Not supported. |

Implementation Note This version of the CWE is used only with OBX-5. CWE\_CRO.9 is always sent in this CWE\_CRO type. The CWE data type is used where it is necessary to communicate a code, text, coding system and the version of coding system the code was drawn from. It also allows the communication of an alternate code drawn from another coding system. Many coded fields in this specification identify coding systems or value sets that must be used for the field. **When populating the CWE data types with these values, this guide does not give preference to the triplet in which the standard code should appear.** The receiver is expected to examine the coding system names in components 3 and 6 to determine if it recognizes the coding system. CWE\_CRO.9 is always sent in this CWE\_CRO type

The CWE data type allows communication CWE Statuses that indicate whether the value is known or not, not applicable, or not available (HL7 Table 0353-CWE Status Codes). The full set of allowable values and its use is in Chapter 2A, Section 2.A.13 under Data Missing. This will be allowed for all uses of CWE\_CRO..

## CX – Extended Composite ID with Check Digit

| Table 2‑8. CX – Extended Composite ID with Check Digit | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..15= | ST | R |  | ID Number | The ID Number component combined with the Assigning Authority component must uniquely identify the associated object, i.e., any object with which the field is associated. Note - despite the component being named “ID Number” this component is an ST string data type, not numeric, so the component is not limited to just numbers. |
| 2 |  |  | O |  | Check Digit |  |
| 3 |  |  | O |  | Check Digit Scheme |  |
| 4 |  | HD | R |  | Assigning Authority | The Assigning Authority component is used to identify the system, application, organization, etc. that assigned the ID Number in component 1. |
| 5 | 2..5 | ID | R | HL70203 ( constrained) see Table 6-n | Identifier Type Code |  |
| 6 |  | HD | RE |  | Assigning Facility | The Assigning Facility identifies the place or location that the ID Number was assigned for use. |
| 7 |  |  | O |  | Effective Date |  |
| 8 |  |  | O |  | Expiration Date |  |
| 9 |  |  | O |  | Assigning Jurisdiction |  |
| 10 |  |  | O |  | Assigning Agency or Department |  |

Implementation Note The CX data type is used to carry identifiers. This guide requires that all identifiers be accompanied by assigning authorities, and that all identifiers carry an identifier type. This method allows the exchange of unique identifiers for the associated object across organizational and enterprise boundaries, enabling broad interoperability.

Although the Identifier Type Code component is required, it is not a part of the actual identifier. Rather, it is metadata about the identifier. The ID Number and Assigning Authority component, together, constitute the actual identifier. The reason for this requirement is to promote forward compatibility with *HL7 Version 3* identifiers, where there is no concept of identifier type codes. Although this guide does not deal directly with *Version 3* constructs, it is intended to work within the context of the HITSP Interoperability constructs, which work with both *Version 2.x* messaging and *Version 3* constructs.

## DR – Date/Time Range

| Table 2‑9. DR – Date/Time Range | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 |  | TS\_4 | RE |  | Range Start Date/Time |  |
| 2 |  | TS\_5 | RE |  | Range End Date/Time |  |

## DT – Date

| Table 2‑10. DT - Date | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 4..8 | - | R |  | Date | Format: YYYY[MM[DD]] |

## DTM – Date/Time

| Table 2‑11. DTM – Date/Time | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 4..24 | - | R |  | Date/Time | Format: YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ] |

Implementation Note It is strongly recommended that the time zone offset always be included in the DTM particularly if the granularity includes hours, minutes, seconds, etc. Specific fields in this implementation guide may require Date/Time to a specific level of granularity, which may require the time zone offset.

## EI – Entity Identifier

| Table 2‑12. EI – Entity Identifier | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Conformance Statement | Comments |
| 1 | 1..199= | ST | R |  | Entity Identifier |  |  |
| 2 | 1..20= | IS | RE | Local | Namespace ID |  | The coding system for this component is locally managed. |
| 3 | 1..199= | ST | R |  | Universal ID | **ELR-004:** EI.3 (Universal ID) SHALL be valued with an ISO-compliant OID. |  |
| 4 | 1..6 | ID | R | HL70301 | Universal ID Type | **ELR-005:** EI.4 (Universal ID Type) SHALL contain the value “ISO”'. |  |

Implementation Note The EI data type is used to carry identifiers. This guide requires that all entity identifiers be accompanied by assigning authorities. This allows the exchange of unique identifiers for the associated object across organizational and enterprise boundaries, enabling broad interoperability.

In the EI data type, the Namespace ID, Universal ID and Universal ID type correspond to the HD data type identified elsewhere. These types, together, are commonly considered the assigning authority for the identifier. The Entity Identifier and Assigning Authority components, together, constitute the actual identifier.

## FN – Family Name

| Table 2‑13. FN – Family Name | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..50# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | R |  | Surname |  |
| 2 |  |  | O |  | Own Surname Prefix |  |
| 3 |  |  | O |  | Own Surname |  |
| 4 |  |  | O |  | Surname Prefix From Partner/Spouse |  |
| 5 |  |  | O |  | Surname From Partner/Spouse |  |

## FT – Formatted Text Data

| Table 2‑14. FT – Formatted Text Data | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Conformance Statement | Comments |
|  | 1..65536 | - | R |  | Formatted Text Data | **ELR-001:** The ST, TX, FT Data types Shall support only the following escape sequences:  \F\ field separator for “|”  \S\ component separator for “^”  \T\ subcomponent separator for “&”  \R\ repetition separator for “~”  \E\ escape character “\” |  |

* + Usage Note

For NTE segments, or when this data type is used in OBX-2 Value Type, one should consider that formatting may be included in either NTE-3, Comment, or OBX-5, Observation Value, based on a monospaced font.  If this type of formatting must be preserved by the receiver, both parties must agree on how to preserve this monospaced font in the final display.  The sender may not assume that such formatting is preserved without specific agreement with the receiver.  The receiver is not obligated to conform to this guide to preserve that type of formatting.

## HD – Hierarchic Designator

| Table 2‑15. HD – Hierarchic Designator | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Conformance Statement | Comments |
| 1 | 1..20= | IS | RE |  | Namespace ID |  | The coding system for this component is locally managed. |
| 2 | 1..199= | ST | R |  | Universal ID | **ELR-062:** HD.2 (Universal ID) If HD.3 (Universal ID type) value is "CLIA", SHALL be a valid CLIA identifier format.  **ELR-063:** HD.2 (Universal ID) If HD.3 (Universal ID type) value is "ISO", SHALL be a valid ISO OID format. | Must be an OID except for Sending Facility (MSH-4) where a CLIA identifier is allowed. |
| 3 | 1..6 | ID | R | HL70301 | Universal ID Type | **ELR-007:** HD.3 (Universal ID Type) IF element is MSH-4.3 (Universal ID type) , then HD.3 (Universal ID type) SHALL contain the value "ISO" OR "CLIA", ELSE HD.3 (Universal ID type) SHALL contain the value "ISO" | Constrained to the value ‘ISO’ except for Sending Facility (MSH-4) where the value ‘CLIA’ is allowed. |

Implementation Note The HD data type is used directly to identify objects such as applications or facilities. It is used also as a component of other data types, where it is typically an assigning authority for an identifier. Where this capability is used in this specification, that usage is described separately. )

## ID – Coded Value for HL7-Defined Tables

| Table 2‑16. ID – Coded Value for HL7-Defined Tables | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..15= | - | R |  | Coded Value for HL7-Defined Tables |  |

## IS – Coded Value for User-Defined Tables

| Table 2-16. IS – CODED VALUE FOR USER-DEFINED TABLES | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |

## MSG – Message Type

| Table 2‑17. MSG – Message Type | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 3..3 | ID | R | HL70076( constrained) see Table 6-n | Message Code |  |
| 2 | 3..3 | ID | R | HL70003 | Trigger Event |  |

## NDL - Name With Date And Location

| Table 2‑18. NDL - NAME WITH DATE AND LOCATION | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 |  | CNN | R |  | Name |  |
| 2 |  | TS | X |  | Start Date/time | Not supported. |
| 3 |  | TS | X |  | End Date/time | Not supported. |
| 4 | 1..20= | IS | X | HL70302 | Point of Care | Not supported. |
| 5 | 1..20= | IS | X | HL70303 | Room | Not supported. |
| 6 | 1..20= | IS | X | HL70304 | Bed | Not supported. |
| 7 |  | HD | X |  | Facility | Not supported. |
| 8 | 1..20= | IS | X | HL7306 | Location Status | Not supported. |
| 9 | 1..20= | IS | X | HL70305 | Person Location Type | Not supported. |
| 10 | 1..20= | IS | X | HL7307 | Building | Not supported. |
| 11 | 1..20= | IS | X | HL7308 | Floor | Not supported. |

## NM – Numeric

| Table 2‑19. NM - Numeric | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..16 | - | R |  | Numeric | HL7 allows only ASCII numeric characters as well as an optional leading plus or minus sign and an option decimal point. Note that use of scientific notation for numbers is not supported by this data type. |

## PRL – Parent Result Link

| Table 2‑20. PRL – Parent Result Link | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 |  | CWE\_CR | R | Laboratory Observation Identifier Value Set | Parent Observation Identifier | Identifier of the OBX-3 Observation ID of the parent result. For details on how this is used, see Section 8.n below. |
| 2 | 1..20= | ST | RE |  | Parent Observation Sub-Identifier | Identifier of the OBX-4 Observation Sub-ID associated with the OBX-3 Observation ID of the parent result. For details on how this is use, see Section 8.n below. |
| 3 | 250 | TX | RE |  | Parent Observation Value Descriptor | Taken from the OBX-5 of the parent result. If OBX-5 contains coded data, this will be the value of the text component of the CE or CWE data type or the original text component of the CWE data type when there is no coded component |

Implementation Note See Section 8.n, of this document for details on how this data type and the EIP data type are used in parent/child result linking. Use of data type CWE\_CR for sequence 1 reflects a pre-adoption of *HL7 Version 2.7.1* standards.

## PT – Processing Type

| Table 2‑21. PT – Processing Type | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..1 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | R | HL70103 | Processing ID |  |
| 2 |  |  | O |  | Processing Mode |  |

|

## RP – Reference Pointer

| Table 2‑22. PR – Reference Pointer | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..999# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | R |  | Pointer | Pointer to the object. For URIs, it contains the path and query parts.  Example:  /phin/library/documents/pdf/DRAFT\_PHIN\_ORU\_ELR\_v2.5.1\_20061221.pdf |
| 2 |  | [HD](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#HD) | R |  | Application ID | Unique identifier of the application that holds the object being pointed to. For URIs, it contains the scheme and authority parts.  Note that the HD data type used for this component is specialized for use in the RP data type, and is different that what is defined in section (HD). |
| 2.1 |  |  | O |  |  |  |
| 2.2 | 1..199= | ST | R |  | Universal ID | This component is restricted to a universal resource identifier (URI). For URIs, contains the scheme and authority parts. Example: http://www.cdc.gov |
| 2.3 | 1..6 | ID | R | HL70301 | Universal ID Type | This component is constrained to support only universal Resource Identifier. Literal value: ‘URI’ |
| 3 | 4..11 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | RE | HL70834 (2.7) | Type of Data | Identifier of the type of data pointed to. For the URI example referenced above, this is '"application."  See section For details of HL70834. |
| 4 | 1..32= | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | RE | HL7[0291](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#Heading407) (2.7) | Subtype | Identifier of the subtype of data pointed to. For the URI example above, this is "pdf," indicating portable document format.  See section for details of HL70291.  Guidance: LEN may need to be expanded upon implementation to accommodate all values. |

Implementation Note The field uses the RP data type to allow communication of pointers to images, sound clips, XML documents, HTML markup, etc. The RP data type is used when the object being pointed to is too large to transmit directly.

This specification defines the mechanism for exchanging pointers to objects, but does not address the details of applications actually accessing and retrieving the objects over a network.

This guide constrains this data type to support only Universal Resource Identifiers (URI). See <http://ietf.org/rfc/rfc2396.txt> for a detailed definition. The general format of a URI is in the form <scheme>://<authority><path>?<query>. The scheme and authority portions appear in the Application ID component, Universal ID subcomponent. The path and query portion of the URI appear in the Pointer component of the RP data type.

## SAD – Street Address

| Table 2‑23. SAD – Street Address | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..120# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | R |  | Street or Mailing Address |  |
| 2 |  |  | O |  | Street Name |  |
| 3 |  |  | O |  | Dwelling Number |  |

Implementation Note The SAD is used only as a component of the XAD data type.

## SI – Sequence ID

| Table 2‑24. SI – Sequence ID | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 1..4= | - | R |  | Sequence ID | Non-negative integer up to 9999. May be further constrained to limit the number of times a segment may repeat. |

## SN – Structured Numeric

| Table 2‑25. SN – Structured Numeric | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Conformance Statement | Comments |
| 1 | 1..2 | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Comparator | **ELR-008**: If valued, SN.1 (Comparator) SHALL contain the value ">" or "<" or ">=" or "<=" or "=" or "<>". | This component defaults to "=" if empty. |
| 2 |  | [NM](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#NM) | RE |  | Num1 |  |  |
| 3 | 1..1 | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Separator/Suffix | **ELR-009**: If valued, SN.3 (Separator/Suffix) SHALL contain the value "-" or "+" or "/" or "." or ":". |  |
| 4 |  | [NM](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#NM) | RE |  | Num2 |  |  |

Implementation Note The structured numeric data type is used to unambiguously express numeric clinical results along with qualifications. This enables receiving systems to store the components separately, and facilitates the use of numeric database queries. Structured numeric values include numeric values (^10) intervals (^0^-^1), ratios (^1^/^2 or ^1^:^2), inequalities (<^10), or categorical results (2^+).

## ST – String Data

| Table 2‑26. ST – String Data | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Conformance Statement | Comments |
| 1 |  | - | R |  | String Data | **ELR-001:** The ST, TX, FT Data types Shall support only the following escape sequences:  \F\ field separator for “|”  \S\ component separator for “^”  \T\ subcomponent separator for “&”  \R\ repetition separator for “~”  \E\ escape character “\” |  |

* + Usage Note
    - When this data type is used in OBX-2 Value Type, one should consider that formatting may be included in OBX-5, Observation Value, based on a monospaced font.  If this type of formatting must be preserved by the receiver, both parties must agree on how to preserve this monospaced font in the final display.  The sender may not assume that such formatting is preserved without specific agreement with the receiver.  The receiver is not obligated to conform to this guide to preserve that type of formatting.

## TM – Time

| Table 2‑27. TM - Time | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 2..16 | - | R |  | Time | Format: HH[MM[SS[.S[S[S[S]]]]]][+/-ZZZZ] |

Implementation Note It is strongly recommended that the time zone offset always be included in the TM. Specific fields in this implementation guide may require time to a specific level of granularity, which may require the time zone offset.

## TS\_0 – Time STAMP

| Table 2‑28. TS\_0 Time Stamp | | | | | |
| --- | --- | --- | --- | --- | --- |
| SEQ | DT | Usage | Value Set | Component Name | Comments |
| 1 | [DTM](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#DTM) | R |  | Time |  |
| 2 | [ID](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#ID) | X |  | Degree of Precision | Not Supported |
| The DTM component of this Time Stamp has the following constraints: | | | | | |
|  |  | R |  | YYYY |  |
|  |  | O |  | MM |  |
|  |  | O |  | DD |  |
|  |  | O |  | HH |  |
|  |  | O |  | MM |  |
|  |  | O |  | [SS.S[S[S[S]]]] |  |
|  |  | O |  | +/- ZZZZ |  |

## TS\_1 – Time Stamp

| Table 2‑29. TS\_1 Time Stamp | | | | | |
| --- | --- | --- | --- | --- | --- |
| SEQ | DT | Usage | Value Set | Component Name | Comments |
| 1 | [DTM](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#DTM) | R |  | Time |  |
| 2 | [ID](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#ID) | X |  | Degree of Precision | Not Supported |
| The DTM component of this Time Stamp has the following constraints: | | | | | |
|  |  | R |  | YYYY |  |
|  |  | R |  | MM |  |
|  |  | R |  | DD |  |
|  |  | R |  | HH |  |
|  |  | R |  | MM |  |
|  |  | R |  | SS |  |
|  |  | O |  | [.S[S[S[S]]]] |  |
|  |  | R |  | +/- ZZZZ |  |

## TS\_3 – Time Stamp

| Table 2‑30. TS\_3 Time Stamp | | | | | |
| --- | --- | --- | --- | --- | --- |
| SEQ | DT | Usage | Value Set | Component Name | Comments |
| 1 | [DTM](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#DTM) | R |  | Time |  |
| 2 | [ID](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#ID) | X |  | Degree of Precision | Not Supported |
| The DTM component of this Time Stamp has the following constraints: | | | | | |
|  |  | R |  | YYYY |  |
|  |  | RE |  | MM |  |
|  |  | RE |  | DD |  |
|  |  | RE |  | HH |  |
|  |  | RE |  | MM |  |
|  |  | O |  | [SS.S[S[S[S]]]] |  |
|  |  | O |  | +/- ZZZZ |  |

## TS\_4 – TIME STAMP

| Table 2‑31. TS\_4 Time Stamp | | | | | |
| --- | --- | --- | --- | --- | --- |
| SEQ | DT | Usage | Value Set | Component Name | Comments |
| 1 | [DTM](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#DTM) | R |  | Time |  |
| 2 | [ID](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#ID) | X |  | Degree of Precision | Not Supported |
| The DTM component of this Time Stamp has the following constraints: | | | | | |
|  |  | R |  | YYYY |  |
|  |  | C(R/X) |  | MM | Condition Predicate: If TS\_4.1 (YYYY) is not valued ‘0000’ |
|  |  | C(R/X) |  | DD | Condition Predicate: If TS\_4.1 (YYYY) is not valued ‘0000’ |
|  |  | C(RE/X) |  | HH | Condition Predicate: If TS\_4.1 (YYYY) is not valued ‘0000’ |
|  |  | C(RE/X) |  | MM | Condition Predicate: If TS\_4.1 (YYYY) is not valued ‘0000’ |
|  |  | C(O/X) |  | [SS.S[S[S[S]]]] | Condition Predicate: If TS\_4.1 (YYYY) is not valued ‘0000’ |
|  |  | O |  | +/- ZZZZ |  |

## TS\_5 – Time stamp

| Table 2‑32. TS\_5 Time Stamp | | | | | |
| --- | --- | --- | --- | --- | --- |
| SEQ | DT | Usage | Value Set | Component Name | Comments |
| 1 | [DTM](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#DTM) | R |  | Time |  |
| 2 | [ID](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#ID) | X |  | Degree of Precision | Not Supported |
| The DTM component of this Time Stamp has the following constraints: | | | | | |
|  |  | R |  | YYYY |  |
|  |  | R |  | MM |  |
|  |  | R |  | DD |  |
|  |  | RE |  | HH |  |
|  |  | RE |  | MM |  |
|  |  | O |  | [SS.S[S[S[S]]]] |  |
|  |  | O |  | +/- ZZZZ |  |

## TX\_6 – Time Stamp

| Table 2‑33. TS\_6 Time Stamp | | | | | |
| --- | --- | --- | --- | --- | --- |
| SEQ | DT | Usage | Value Set | Component Name | Comments |
| 1 | [DTM](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#DTM) | R |  | Time |  |
| 2 | [ID](file:///D:\Jean's%20Documents\AppData\Local\Microsoft\kreislera\My%20Documents\HL7\Documents\hl725\std25\ch02A.html#ID) | X |  | Degree of Precision | Not Supported |
| The DTM component of this Time Stamp has the following constraints: | | | | | |
|  |  | R |  | YYYY |  |
|  |  | R |  | MM |  |
|  |  | R |  | DD |  |
|  |  | R |  | HH |  |
|  |  | R |  | MM |  |
|  |  | R |  | SS |  |
|  |  | O |  | [.S[S[S[S]]]] |  |
|  |  | O |  | +/- ZZZZ |  |

## TX – Text Data

| Table 2‑34. TX – Text Data | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Conformance Statement | Comments |
| 1 |  | - | R |  | Text Data | **ELR-001:** The ST, TX, FT Data types Shall support only the following escape sequences:  \F\ field separator for “|”  \S\ component separator for “^”  \T\ subcomponent separator for “&”  \R\ repetition separator for “~”  \E\ escape character “\” |  |

* + Usage Note
    - When this data type is used in OBX-2 Value Type, one should consider that formatting may be included in OBX-5, Observation Value, based on a monospaced font.  If this type of formatting must be preserved by the receiver, both parties must agree on how to preserve this monospaced font in the final display.  The sender may not assume that such formatting is preserved without specific agreement with the receiver.  The receiver is not obligated to conform to this guide to preserve that type of formatting.

## VID – Version Identifier

| Table 2‑35. VID –Version Identifier | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 | 3..5 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | R | HL7[0104](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02.html#Heading224) | Version ID | Restricted to *2.5.1* in this guide.  Literal value: ‘2.5.1’ |
| 2 |  |  | O |  |  |  |
| 3 |  |  | O |  |  |  |

## XAD – Extended Address

| Table 2‑36. XAD – Extended Address | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Conformance Statement | Comments |
| 1 |  | [SAD](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#SAD) | RE |  | Street Address |  |  |
| 2 | 1..120# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Other Designation |  | Example: Suite 555 |
| 3 | 1..50# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | City |  |  |
| 4 | 1..50# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE | State Value Set | State or Province | **ELR-010:** XAD.4 (State or Province) SHALL use the FIPS 5-2 two letter alphabetic codes. |  |
| 5 | 1..12= | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE | Postal Code Value Set | Zip or Postal Code | **ELR-011:** XAD.5 (Zip or Postal Code) SHALL be formatted as 99999[-9999] for US Zip or ZIP +4 codes or as A9A9A9 for Canadian postal codes. |  |
| 6 | 3..3 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | RE | Country Value Set | Country |  |  |
| 7 | 1..3 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | RE | HL70190 | Address Type |  |  |
| 8 |  |  | O |  |  |  |  |
| 9 | 1..20= | [IS](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#IS) | RE | PHVS\_County\_FIPS\_6-4 | County/Parish Code | **ELR-067:** XAD.9  (County/Parish Code) SHALL be formatted as 99999. |  |
| 10 |  |  | O |  |  |  |  |
| 11 |  |  | O |  |  |  |  |
| 12 |  |  | X |  |  |  | Not supported. |
| 13 |  |  | O |  |  |  |  |
| 14 |  |  | O |  |  |  |  |

## XCN – Extended Composite ID Number and Name for Persons

| Table 2‑37. XCN – Extended Composite ID Number and Name for Persons | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Comments |
| 1 | 1..15= | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | ID Number |  | The ID Number component combined with the Assigning Authority component (component 9) must uniquely identify the associated person. Note - despite the component being named “ID Number” this component is an ST string data type, not numeric, so the component is not limited to just numbers. |
| 2 |  | [FN](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#FN) | RE |  | Family Name |  |  |
| 3 | 1..30# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Given Name |  | I.e., first name. |
| 4 | 1..30# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Second and Further Given Names or Initials Thereof |  |  |
| 5 | 1..20# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Suffix (e.g., JR or III) |  |  |
| 6 | 1..20# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Prefix (e.g., DR) |  |  |
| 7 |  |  | O |  |  |  |  |
| 8 |  |  | O |  |  |  |  |
| 9 |  | [HD](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#HD) | C(R/X) |  | Assigning Authority | IF XCN.1 (ID Number) is valued. | The Assigning Authority component is used to identify the system, application, organization, etc. that assigned the ID Number in component 1. |
| 10 | 1..5 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | RE | HL70200 | Name Type Code |  | Defaults to l (legal name) if empty. |
| 11 |  |  | O |  |  |  |  |
| 12 |  |  | O |  |  |  |  |
| 13 | 2..5 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | C(R/X) | HL70203 ( CONSTRAINED) SEE TABLE 6-N | Identifier Type Code | IF XCN.1 (ID Number) is valued. |  |
| 14 |  | [HD](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#HD) | RE |  | Assigning Facility |  |  |
| 15 |  |  | O |  |  |  |  |
| 16 |  |  | O |  |  |  |  |
| 17 |  |  | X |  |  |  | Not supported. |
| 18 |  |  | O |  |  |  |  |
| 19 |  |  | O |  |  |  |  |
| 20 |  |  | O |  |  |  |  |
| 21 | 1..199# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Professional Suffix |  | Suggest using values from HL7 table 360. |
| 22 |  |  | O |  | Assigning Jurisdiction |  |  |
| 23 |  |  | O |  | Assigning Agency or Department |  |  |

## XON – Extended Composite Name and Identification Number for Organizations

| Table 2‑38. XON – Extended Composite Name and Identification Number for Organizations | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Comments |
| 1 | 1..50# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | C(R/RE) |  | Organization Name | IF XON.10 (ID Number) is not valued. |  |
| 2 | 1..20= | [IS](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#IS) | RE | HL7[0204](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#Heading552) | Organization Name Type Code |  |  |
| 3 |  |  | X |  | ID Number |  | Not supported.. |
| 4 |  |  | O |  |  |  |  |
| 5 |  |  | O | HL70061 |  |  |  |
| 6 |  | [HD](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#HD) | C(R/X) |  | Assigning Authority | IF XON.10 (ID Number) is valued. | The Assigning Authority component is used to identify the system, application, organization, etc. that assigned the ID in component 10. |
| 7 | 2..5 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | C(R/X) | HL70203 ( CONSTRAINED) SEE TABLE 6-N | Identifier Type Code | IF XON.10 (ID Number) is valued. |  |
| 8 |  |  | O |  |  |  |  |
| 9 |  |  | O |  |  |  |  |
| 10 | 1..20= | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Organization Identifier |  |  |

## XPN – Extended Person Name

| Table 2‑39. XPN – Extended Person Name | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Comments |
| 1 |  | [FN](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#FN) | RE |  | Family Name |  |
| 2 | 1..30# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Given Name | I.e., first name. |
| 3 | 1..30# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Second and Further Given Names or Initials Thereof |  |
| 4 | 1..20# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Suffix (e.g., JR or III) |  |
| 5 | 1..20# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Prefix (e.g., DR) |  |
| 6 |  |  | O |  | Degree (e.g., MD) |  |
| 7 | 1..5 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | RE | HL70200 | Name Type Code | Defaults to l (legal name) if empty. |
| 8 |  |  | O |  |  |  |
| 9 |  |  | O |  |  |  |
| 10 |  |  | X |  | Name Validity Range | Not supported.. |
| 11 |  |  | O |  |  |  |
| 12 |  |  | O |  |  |  |
| 13 |  |  | O |  |  |  |
| 14 | 1..199# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE |  | Professional Suffix | Suggest using values from HL7 table 360. |

## Extended Telecommunication Number (XTN)

| Table 2‑40. XTN – Extended Telecommunication Number | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SEQ | LEN | DT | Usage | Value Set | Component Name | Condition Predicate | Comments |
| 1 |  |  | X |  | Telephone Number |  | Not supported. |
| 2 | 3..3 | ID | RE | HL70201 | Telecommunication Use Code |  | Should use ‘NET’ if component 4 (Email Address) is present. |
| 3 | 2..8 | [ID](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ST) | RE | HL70202 | Telecommunication Equipment Type |  | Should use ‘Internet’ if component 4 (Email Address) is present. |
| 4 | 1..199= | ST | C(R/X) |  | Email Address | IF XTN.7 (local number) is not valued. |  |
| 5 | 1..3= | NM | C(RE/X) |  | Country Code | IF XTN.7 (local number) is valued. | . |
| 6 | 1..3= | [NM](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#IS) | C(RE/X) |  | Area/City Code | IF XTN.7 (local number) is valued. |  |
| 7 | 1..9= | NM | C(R/X) |  | Local Number | IF XTN.4 (Email Address) is not valued. |  |
| 8 | 1..5= | [NM](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#ID) | C(RE/X) |  | Extension | IF XTN.7 (Local Number) is valued. | . |
| 9 | 1..199# | [ST](https://www.aphlweb.org/aphl_departments/Strategic_Initiatives_and_Research/Informatics_Program/Projects/Eric/Documents/kreislera/My%20Documents/HL7/Documents/hl725/std25/ch02A.html#CE) | RE |  | Any Text |  | For example: “Regular hours 8 am to 5 pm.” |
| 10 |  |  | X |  | Extension Prefix |  | Not supported. |
| 11 |  |  | X |  | Speed Dial Code |  | Not supported. |
| 12 |  |  | X |  | Unformatted Telephone number |  | Not supported. |

Usage Note

Component 4 (Email Address) and component 7 (Local Number) are mutually exclusive. You must populate one or the other, but not both in a single repeat of this data type.

# Messages

Note numbering for conformance statements will be updated once the comment resolution is completed

The following sections detail the structure of each message, including segment name, usage, cardinality and description. See section 1.4.1 (Message Element Attributes) for a description of the columns in the Abstract Message Syntax Tables. Note: Unless otherwise stated in table it is assumed the Condition Predicate and Conformance statements pertains to the PHLabReport Component Profile. The reader is referred to Sections 1.12 above regarding the Component Profiles.

## ORU^R01^ORU\_R01

The ORU^R01 message is constrained for transmitting laboratory results from the testing source to to the Public Health Receiver as defined in theUse Case.

| Table 3‑1. ORU^R01^ORU\_R01 | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Segment | Name | Cardinality | Usage | Condition Predicate | Conformance Statement | Description |
| MSH | Message Header | [1..1] | R |  |  | The message header (MSH) segment contains information describing how to parse and process the message. This includes identification of message delimiters, sender, receiver, message type, timestamp, etc. |
| [{SFT}] | Software Segment | [1..\*] | R |  |  | Each HL7 aware application that touches the message on the way to the destination application must add a SFT segment for its application. For instance, PHIN MS is not HL7 aware and would not be expected to add an SFT. On the other hand, an integration engine is HL7 aware and would be expected to add an SFT.  The first repeat (i.e., the Laboratory Result Sender actor) is required. Any other application that transforms the message must add an SFT segment for that application. Other applications that route or act as a conduit may add an SFT but are not required to do so. |
| { | PATIENT\_RESULT Begin | [1..1] | R |  |  |  |
| [ | PATIENT Begin | [1..1] | R |  |  | For public health reporting, the patient group is required. |
| PID | Patient Identification | [1..1] | R |  |  | The patient identification (PID) segment is used to provide basic demographics regarding the subject of the testing. The subject may be a person or animal. |
| [PD1] | Additional Demographics |  | O |  |  |  |
| [{NTE}] | Notes and Comments for PID | [0..\*] | RE |  |  | This notes and comments (NTE) segment should contain notes or comments pertaining to the patient identified in the PID segment. It should not contain order or result related comments. |
| [{NK1}] | Next of Kin/Associated Parties | [0..\*] | RE |  |  | The next of kin (NK1) segment can be used to document the patient’s next of kin, employer, guardian, etc. Particular jurisdictions may require the NK1 segment to contain parent/guardian information when reporting lead testing results for children. When reporting results of animal testing (for example testing animals for rabies) the NK1 segment can be used to identify the owner of the animal. |
| [ | VISIT Begin | [0..1] | RE |  |  |  |
| PV1 | Patient Visit | [1..1] | R |  |  | HL7 requires that the patient visit (PV1) segment be present if the VISIT group is present. |
| [PV2] | Patient Visit – Additional Information |  | O |  |  |  |
| ] | VISIT End |  |  |  |  |  |
| ] | PATIENT End |  |  |  |  |  |
| { | ORDER\_OBSERVATION Begin | [1..\*] | R |  | **ELR-061:** Only Snapshot processing SHALL be supported | The order group is required and can repeat. This means that multiple ordered tests may be performed on a specimen.  Snapshot processing of the result message involves processing as a snapshot all the repeats of the ORDER\_OBSERVATION group together as a group. This is especially important when dealing with parent/child results (such as cultures and sensitivities) which will span multiple ORDER\_OBSERVATION groups. All these must be processed from both a message sender and message receiver perspective as a single snapshot. |
| [ORC] | Order Common | [1..1] | R |  |  | The common order (ORC) segment identifies basic information about the order for testing of the specimen. This segment includes identifiers of the order, who placed the order, when it was placed, what action to take regarding the order, etc. |
| OBR | Observations Request | [1..1] | R |  |  | The observation request (OBR) segment is used to capture information about one test being performed on the specimen. Most importantly, the OBR identifies the type of testing to be performed on the specimen, and ties that information to the order for the testing. |
| [{NTE}] | Notes and Comments for OBR | [0..\*] | RE |  |  |  |
| { | TIMING\_QTY Begin | [0..1] | RE |  |  |  |
| TQ1 | Timing/Quantity | [1..1] | R |  |  |  |
| [{TQ2}] | Timing/Quantity Order Sequence |  | O |  |  |  |
| } | TIMING\_QTY End |  |  |  |  |  |
| [CTD] | Contact Data |  | O |  |  |  |
| [{ | OBSERVATION Begin | [0..\*] | C(R/X) | IF OBR.25 (Result Status) is valued “A”, “C”, “F”, “P”, or “R”. |  | Multiple results may be associated with an order. There will always be a single OBX in the results group.  Snapshot processing: Since the OBX segment in *2.5.1* does not contain a unique instance identifier, it is assumed that the repeating observation group will contain a complete set of observations (OBXs) associated with the OBR. Where a single OBX is being updated, all the OBXs related to the OBR must accompany the updated OBX, i.e., a full snapshot is sent |
| OBX | Observation related to OBR | [1..1] | R |  |  | The observation/result (OBX) segment contains information regarding a single observation (analyte) result. This includes identification of the specific type of observation, the result for the observation, when the observation was made, etc.  For laboratory testing, the OBX is normally reporting the results of a test performed on a specimen, Because the ORU^R01^ORU\_R01 message structure allows multiple specimens to be associated with a single OBR, there is no direct way to tell which specimen a particular OBX is associated with. There are other HL7 messages for laboratory results where this ambiguity does not exist, but were not chosen for this implementation guide. |
| [{NTE}] | Notes and Comments | [0..\*] | RE |  |  | The notes and comment (NTE) segment may carry comments related to the result being reported in the OBX segment. |
| }] | OBSERVATION End |  |  |  |  |  |
| [{FT1}] | Financial Transaction |  | O |  |  |  |
| {[CTI]} | Clinical Trial Identification |  | O |  |  |  |
| - [{ | SPECIMEN Begin | [0..1] | RE |  | **ELR-064:** Specimen (Specimen Group) SHALL be present in at least one occurrence of one Order\_Observation Group. | The specimen group is conditionally required in the ORU and is used to carry specimen information that is no longer contained in the OBR segment. It also provides a place for the specimen number. Each specimen group documents a single sample. Note that for ELR, the message has been constrained to support a single SPECIMEN group per OBR, meaning only a single specimen can be associated with the OBR.  At least one specimen group is required in the message. |
| SPM | Specimen Information related to OBR | [1..1] | R |  |  | The specimen information (SPM) segment describes the characteristics of a single sample. The SPM segment carries information regarding the type of specimen, where and how it was collected, who collected it, and some basic characteristics of the specimen. |
| [{OBX}] | Observation related to Specimen | [0..\*] | RE |  |  | The Observation related to Specimen is generally used to report additional characteristics related to the specimen. It is not used to report the results of the requested testing identified in OBR-4 (Universal Service ID). The observations associated with the specimen are typically information that the ordering providing sends with the order. The laboratory forwards that information as part of the result message.  One recommended value to report in the OBX related to Specimen is the age of patient at time of specimen collection. The appropriate LOINC code for this is 35659-2 (Age at specimen collection).  Other possible types of observations include:  Was specimen sent out?  Was it a specimen or isolate?  Id of the specimen/isolate sent for testing  Where was the specimen sent?  Reason for send out?  Implementers will need to provide a list of expected observations associated with specimen. |
| }] | SPECIMEN End |  |  |  |  |  |
| } | ORDER\_ OBSERVATION End |  |  |  |  |  |
| } | PATIENT\_RESULT End |  |  |  |  |  |
| [DSC] | Continuation Pointer |  | X |  |  | Not supported. |

### Diagram of ORU^R01^ORU\_R01

The following diagram shows a simple view of the ORU^R01^ORU\_R01 message structure. The green boxes represent the key segments in the HL7 result message and include the MSH, PID, OBR and OBX segments. The data found in these segments are key to the laboratory report. Data found in the other segments may be important but are not key to interpreting the message. Note that this diagram does not show repeating elements of the message (repeating groups or segments). It represents the way in which information in the message is related. Neither does this diagram capture the conditions on when some of the segments must be present in the message. For instance, there must be an ORC segment present in the message in the first repeat of the ORDER\_OBSERVATION group.

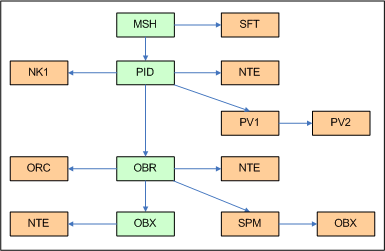


Figure 6. 2.5.1 ELR Message

### Comparison with the 2.3.1 ORU^R01

The following diagram shows the structure of the 2.3.1 ELR message.

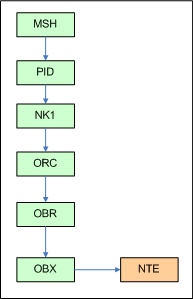


Figure 7. 2.3.1 ELR Message

The message structure for the 2.3.1 ELR message is simpler than the 2.5.1 ELR message described above. There are several reasons for this including the following:

* The 2.5.1 ELR message adheres strictly to the ORU^R01 message structure described by HL7 in 2.5.1. The 2.3.1 ELR message rearranged some of the groups in the message to suite ELR purposes. Unfortunately, this approach breaks XML implementations of the HL7 standard.
* The 2.5.1 ELR message includes new segments introduced by HL7. This includes the SFT and SPM segments. The SFT segment is used to document new information that was not contained in the original 2.3.1 ELR message. The SPM segment was added by HL7 to replace some fields found in the OBR segment. The SPM segment provides additional information about the specimen not found in the 2.3.1 message.
* Support for the PV1 and PV2 segments have been added to the 2.5.1 ELR message. Both segments were part of the underlying HL7 standard for the ORU^R01 in 2.3.1 and 2.5.1. The difference here is that the 2.5.1 ELR has included support for some of this information in the 2.5.1 ELR message based upon states identifying a need for this information.
* Additional support for the NTE segment has been added to the 2.5.1 ELR message. NTE’s associated with the PID and OBR were part of the underlying HL7 standard for the ORU^R01 in 2.3.1 and 2.5.1. The difference here is that the 2.5.1 ELR has included support for additional comments in this message based upon states identifying a need for this information.

## ACK^R01^ACK

Use of an ACK message by the ELR Receiver is permitted for PHLabReport-AckMessage Profile and LRI\_GU\_RU\_Profile + LRI\_PH\_COMPONENT and should be used as described in this guide. All other acknowledgement methods are beyond the scope of this document

| Table 3‑2. ACK^R01^ACK | | | | | |
| --- | --- | --- | --- | --- | --- |
| Segment | Name | Cardinality | Usage | Condition Predicate | Description |
| MSH | Message Header | [1..1] | R |  | The message header (MSH) segment contains information describing how to parse and process the message. This includes identification of message delimiters, sender, receiver, message type, timestamp, etc. |
| [{SFT}] | Software Segment | [1..\*] | R |  | Each HL7 aware application that touches the message on the way to the destination application must add a SFT segment for its application. For instance, PHIN MS is not HL7 aware and would not be expected to add an SFT. On the other hand, an integration engine is HL7 aware and would be expected to add an SFT.  The first repeat (i.e., the originator) is required. Any other application that transforms the message must add an SFT segment for that application. Other applications that route or act as a conduit may add an SFT but are not required to do so. |
| MSA | Message Acknowledgment | [1..1] | R |  |  |
| [{ ERR }] | Error | [0..\*] | C(R/O) | Condition predicate: If MSA-1 (Message Acknowledgement) is not valued AA or CA |  |

## HL7 Batch Protocol

The PHLabReport-Batch profile is used where Batch messaging is implemented. The frequencies of batch transmissions are left to specific implementations. Batches may be sent more often if the message size or resource requirements dictate. Acknowledgement methods for batch messaging are beyond the scope of this document. . The reader is directed to HL7 Version 2.7.1, Chapter 2 Section 2.10.3 *HL7 batch protocol* for further guidance

| Table 3‑3. HL7 Batch Protocol | | | | |
| --- | --- | --- | --- | --- |
| Segment | Name | Cardinality | Usage | Description |
| [FHS] | File Header Segment | [1..1] | R | File header required. |
| { | --- BATCH begin | [1..1] | R | One batch per file supported. |
| [BHS] | Batch Header Segment | [1..1] | R | One batch per file supported. |
| {[ | --- MESSAGE begin | [1..\*] | R | One or more messages per batch supported. |
| MSH | (start of one or more HL7 messages) | [1..1] | R |  |
| .... |  |  |  |  |
| ]} | --- MESSAGE end |  |  |  |
| [BTS] | Batch Trailer Segment | [1..1] | R |  |
| } | --- Batch end |  |  |  |
| [FTS] | File Trailer Segment | [1..1] | R |  |

# Segment and Field Descriptions

Note numbering for conformance statements will be updated once the comment resolution is completed

This messaging guide provides notes for supported fields. The following format is used in this document for listing and defining message segments and fields. First, the message segment use is defined and then a segment attribute table listing all fields defined in the segment is shown. See section 1.4.1 (Message Element Attributes) for a description of the columns in the Segment Attribute Tables. Unless otherwise stated in table it is assumed the Condition Predicate and Conformance statements pertains to the PHLabReport Component Profile. The reader is referred to Sections 1.12 above regarding the Component Profiles.

## MSH – Message Header Segment

The Message Header Segment (MSH) contains information describing how to parse and process the message. This includes identification of message delimiters, sender, receiver, message type, timestamp, etc.

| Table 4‑1. MSH – Message Header Segment | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Condition Predicate | Conformance Statement | Description/  Comments |
| 1 | 1..1 | ST | [1..1] | R |  | Field Separator |  | ORU  **ELR-012:** MSH-1 (Field Separator) SHALL contain the constant value ‘|’.  ACK  **ELR-0nn:** MSH-1 (Field Separator) SHALL contain the constant value ‘|’. |  |
| 2 | 4..5 | ST | [1..1] | R |  | Encoding Characters |  | ORU  **ELR-013:** MSH-2 (Encoding Characters) SHALL contain the constant value ‘^~\&#’ OR ‘^~\&’  ACK  **ELR-nnn:** MSH-2 (Encoding Characters) SHALL contain the constant value ‘^~\&#’ OR ‘^~\&’ |  |
| 3 |  | HD | [1..1] | R |  | Sending Application |  |  | Field that may be used to identify the sending application uniquely for messaging purposes.  For this field only, if all three components of the HD are valued, the first component defines a member in the set defined by the second and third components. |
| 4 |  | HD | [1..1] | R |  | Sending Facility |  |  | Field that uniquely identifies the facility associated with the application that plays the Laboratory Result Sender Actor (see section 3.1 Use Case Model) that sends the message. If acknowledgments are in use, this facility will receive any related acknowledgment message.  For laboratories originating messages, the CLIA identifier is allowed for the Universal ID component of the HD data type. Non-laboratory facilities taking on the Laboratory Result Sender actor role will use an OID for this field. |
| 5 |  | HD | [1..1] | R |  | Receiving Application |  |  | Field that may be used to identify the receiving application uniquely for messaging purposes. For this field only, if all three components of the HD are valued, the first component defines a member in the set defined by the second and third components. |
| 6 |  | HD | [1..1] | R |  | Receiving Facility |  |  | Field that uniquely identifies the facility for the application that plays the Laboratory Result Receiver Actor (see section 3.1 Use Case Model) and receives the message. If acknowledgments are in use, this facility originates any related acknowledgment message. |
| 7 |  | TS\_1 | [1..1] | R |  | Date/Time Of Message |  |  | Field containing the date/time the message was created by the sending system.  Note that the time zone offset is required and applies to all other date/time fields in the same message instance where a time zone offset is not valued |
| 8 |  |  |  | O |  | Security |  |  |  |
| 9 |  | MSG | [1..1] | R |  | Message Type |  | ORU  **ELR- nnn:** MSH-9 (Message Type) SHALL contain the constant value ‘ORU^R01^ORU\_R01’.  ACK  **ELR-nnn:**  MSH-9 (Message Type) SHALL contain the constant value ‘ACK^R01^ACK’. | For the result message Literal Value: ‘ORU^R01^ORU\_R01’.  For the acknowledgement message Literal Value: ‘ACK^R01^ACK’. |
| 10 | 1..199= | ST | [1..1] | R |  | Message Control ID |  |  | String that uniquely identifies the message instance from the sending application. Example formats for message control IDs include GUID, timestamp plus sequence number, OID plus sequence number or sequence number. The important point is that care must be taken to insure that the message control id is unique. The sending application (MSH-3) plus MSH-10 (message control id) needs to be globally unique. |
| 11 |  | PT | [1..1] | R |  | Processing ID |  |  | Field that may be used to indicate the intent for processing the message, such as "T" (training,) "D" (debug,) or "P" (production.) |
| 12 |  | VID | [1..1] | R |  | Version ID |  | ORU  **ELR-018:** MSH-12.1 (Version ID) SHALL contain the constant value '2.5.1'.  ACK  **ELR-nnn:** MSH-12.1 (Version ID) SHALL contain the constant value '2.5.1'. | HL7 version number used to interpret format and content of the message. For this message, the version ID will always be Literal Value: *2.5.1.*  Note that receivers must examine MHS-21 (Message Profile Identifier) to understand which message profile the message instance conforms with. |
| 13 |  |  |  | O |  | Sequence Number |  |  |  |
| 14 |  |  |  | O |  | Continuation Pointer |  |  |  |
| 15 | 2..2 | ID | [1..1] | C(R/RE)  R | HL70155 (Constrained) | Accept Acknowledgment Type | If the first component (Entity Identifier) of one occurrence of MSH-21 (Message Profile Identifier) is ‘PHLabReport-Ack’. | **ELR-019:** MSH-15 (Accept Acknowledgment Type) SHALL contain the constant value ‘AL’ IF any occurrence of MSH-21.3 (Entity Identifier) is 2.16.840.1.113883.9.NNN, ELSE, ~~if valued,~~ SHALL contain the constant value 'NE'.  PHReturnAck Component:  **ELR- nnn**: MSH-15 (Accept Acknowledgement Type) SHALL contain the constant value ‘NE’. | Required when MSH-21 profile id is PHLabReport-Ack, Otherwise it may be empty or “NE”. |
| 16 | 2..2 | ID | [1..1] | C(R/RE)  R | HL70155 (Constrained) | Application Acknowledgment Type | If the first component (Entity Identifier) of one occurrence of MSH-21 (Message Profile Identifier) is ‘PHLabReport-Ack’. | **ELR-020:** MSH-16 (Application Acknowledgement Type) SHALL contain ‘AL’, 'NE', 'ER', or 'SU', IF any occurrence of MSH-21.1 (Entity Identifier) is 'PHLabReport-Ack', ELSE, if valued, SHALL contain the constant value 'NE'.  PHReturnAck Component:  **ELR-nnn:** MSH-16 (Application Acknowledgement Type) SHALL contain ‘AL’, 'NE', 'ER', or 'SU', IF any occurrence of MSH-21.1 (Entity Identifier) is 'PHLabReport-Ack', ELSE, if valued, SHALL contain the constant value 'NE'. | Required when MSH-21 profile id is PHLabReport-Ack, otherwise it may be empty or “NE |
| 17 |  |  |  | O | Country Value Set | Country Code |  |  |  |
| 18 |  |  |  | O | HL70211 | Character Set |  |  |  |
| 19 |  |  |  | O |  | Principal Language Of Message |  |  |  |
| 20 |  |  |  | O | HL70356 | Alternate Character Set Handling Scheme |  |  |  |
| 21 |  | EI | [1..\*] | R |  | Message Profile Identifier |  | ORU  **ELR-021:** The first component (Entity Identifier) of one occurrence of MSH-21 (Message Profile Identifier) SHALL be valued with 'PHLabReport-Ack' OR 'PHLabReport-NoAck' OR 'PHLabReport-Batch'  **ELR-022:** The third component (Universal ID) of one occurrence of MSH-21 (Message Profile Identifier) SHALL contain the value "2.16.840.1.113883.9.NNN"  ACK  **ELR-nnn:** The third component (Universal ID) of one occurrence of MSH-21 (Message Profile Identifier) SHALL contain the value "2.16.840.1.113883.9.NNN" | Field used to reference or assert adherence to a message profile[[5]](#footnote-5). Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages. This field is allowed to repeat. If multiple profiles are listed in this field, it is assumed the profiles aren’t contradictory. If they were contradictory, this would be the basis for an error. The rules described by HL7 Chapter 2.1 about constraining profiles apply. The profile ID for the profile defined in this guide should appear as a Repeat. Other profile IDs may appear in the field, as well, in cases where more constrained profiles are created from this profile. An OID for this profile is available once it is assigned.  Value is based on profile id from dynamic definition in section . |

Implementation Note:

MSH-21 (Message Profile Identifier) shall identify exclusively one ELR results profile (i.e., MSH-21 shall not be populated with conflicting ELR profile or ELR components).

Additional compatible profiles or components can be present in MSH-21; for example, if an ELR profile or component is further constrained.

The table below indicates valid MSH-21 combinations for declaring conformance to a particular ELR Result profile or components.

| Table 4‑2. MSH 21 Result Profile Combinations | |
| --- | --- |
| Component Name | Component OIDs |
| PHLabReport | 2.16.840.1.113883.9.NNN |
| PHLabReport + PHLabReport-Ack | 2.16.840.1.113883.9.NNN  2.16.840.1.113883.9.NNN |
| PHLabReport + PHLabReport-Batch | 2.16.840.1.113883.9.NNN  2.16.840.1.113883.9.NNN |

For each of the combinations illustrated, the following additional profile component identifiers can be specified:

* PHLabReport-XO - 2.16.840.1.113883.9.NNN
* PHLabReport-CO - 2.16.840.1.113883.9.NNN
* PHLabReport-SCTO - 2.16.840.1.113883.9.NNN
* PHLabReport-NoCE - 2.16.840.1.113883.9.NNN
* PHLabReport-NoNM - 2.16.840.1.113883.9.NNN

**Example PHLabReport Profile Using Component OIDs**

MSH…|||||PHLabReport^^2.16.840.1.113883.9.NNN^ISO

**Example: PHLabReport + PHLabReport-Ack Profile Using Component OIDs**

MSH…|||||PHLabReport^^2.16.840.1.113883.9.NNN^ISO~PHLabReportAck^^2.16.840.1.113883.9.NNN^ISO

**Example: PHLabReport + PHLabReport-Batch Profile Using Component OIDs**

MSH…|||||PHLabReport^^2.16.840.1.113883.9.NNN^ISO~PHLabReport-Batch^^2.16.840.1.113883.9.NNN^ISO

## SFT – Software segment

The software segment provides information about the sending application or other applications that manipulate the message before the receiving application processes the message. In this guide, the Laboratory Result Sender actor is required to populate the first SFT segment. Any other application that transforms the message must add an SFT segment for that application. Other applications that route or act as a conduit may add an SFT but are not required to do so. See , Actor, Laboratory Result Sender for further discussion the types of roles applications may play in these data exchanges. Based on that discussion, and HL7 Application (including gateways) is required to populate an SFT segment, while bridges and intermediaries may add an SFT but are not required to do so.

| Table 4‑3. SFT – Software Segment | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Conformance Statement | Description/Comments |
| 1 |  | XON | [1..1] | R |  | Software Vendor Organization |  |  |
| 2 | 1..15# | ST | [1..1] | R |  | Software Certified Version or Release Number |  |  |
| 3 | 1..20# | ST | [1..1] | R |  | Software Product Name |  |  |
| 4 | 1..20# | ST | [1..1] | R |  | Software Binary ID |  |  |
| 5 |  |  |  | O |  | Software Product Information |  |  |
| 6 |  | TS\_0 | [0..1] | RE |  | Software Install Date |  |  |

## MSA – Acknowledgement Segment

The Message Response Segment (MSA) contains the information sent as acknowledgment to the order message received by a Laboratory Information System.

| Table 4‑4. MSA – Acknowledgement Segment | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Description/Comments |
| 1 | 2..2 | ID | [1..1] | R | HL70008 | Acknowledgment Code | Acknowledgment code indicating receipt  of message. |
| 2 | 1..199= | ST | [1..1] | R |  | Message Control ID | Identifier that enables the sending system to associate this response with the message for which it is intended. This value will be the MSH.10 message control ID from the message being acknowledged. |
| 3 |  |  |  | X |  | Text Message | Not supported. |
| 4 |  |  |  | O |  | Expected Sequence Number |  |
| 5 |  |  |  | X |  | Delayed Acknowledgment Type | Not supported. |
| 6 |  |  |  | X |  | Error Condition | Not supported. |

## ERR – Error Segment

The ERR segment is used to add error comments to acknowledgment messages.

| Table 4‑5. ERR – Error Segment | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Description/Comments |
| 1 |  |  |  | X |  | Error Code and Location | Not supported. |
| 2 |  |  |  | O |  | Error Location |  |
| 3 |  | CWE\_CRE | [1..1] | R | HL70357 | HL7 Error Code | Identifies the HL7 (communications) error code. |
| 4 | 1..1 | ID | [1..\*] | R | HL70516 | Severity | Identifies the severity of an application error. Knowing if something is Error, Warning, or Information is intrinsic to how an application handles the content. |
| 5 |  |  |  | O |  | Application Error Code |  |
| 6 |  |  |  | O |  | Application Error Parameter |  |
| 7 | 1..2048# | TX | [0..1] | RE |  | Diagnostic Information | Information that may be used by help desk or other support personnel to diagnose a problem. |
| 8 | 1..250# | TX | [0..1] | RE |  | User Message |  |
| 9 |  |  |  | X |  | Inform Person Indicator | Not supported. |
| 10 |  |  |  | X |  | Override Type | Not supported. |
| 11 |  |  |  | X |  | Override Reason Code | Not supported. |
| 12 |  | XTN | [0..\*] | RE |  | Help Desk Contact Point |  |

## PID – Patient Identification Segment

The Patient Identification Segment (PID) is used to provide basic demographics regarding the subject of the testing. The subject may be a person or animal.

| Table 4‑6. PID – Patient Identification Segment | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Condition Predicate | Conformance Statement | Description/Comments |
| 1 | 1..4 | SI | [1..1] | R |  | Set ID – PID |  | **ELR-024:** PID-1 (Set ID – PID) SHALL contain the constant value ‘1’. |  |
| 2 |  | CX | [0..0] | X |  | Patient ID |  |  | Not supported. |
| 3 |  | CX | [1..\*] | R |  | Patient Identifier List |  |  | Field used to convey all types of patient/person identifiers. This includes social security numbers, driver’s license numbers, medical record numbers, etc. |
| 4 |  | CX | [0..0] | X |  | Alternate Patient ID – PID |  |  | Not supported. |
| 5 |  | XPN | [1..\*] | R |  | Patient Name |  |  | Patient name or aliases. When the name of the patient is not known, a value must still be placed in this field since the field is required. In that case, HL7 recommends the following: |~^^^^^^U|. The "U" for the name type code in the second name indicates that it is unspecified. Since there may be no name components populated, this means there is no legal name, nor is there an alias. This guide will interpret this sequence to mean there is no patient name. |
| 6 |  | XPN | [0..1] | RE |  | Mother’s Maiden Name |  | **ELR-025:** If valued, PID- 6.7 (Name Type Code) SHALL contain the constant value ‘M'. | May be included for identification purposes. Name type code is constrained to the value "M." |
| 7 |  | TS\_3 | [0..1] | RE |  | Date/Time of Birth |  | **ELR-027:** If PID-7 (Date/Time of Birth) is not valued, then an OBX segment associated with the SPM segment SHALL be present to report patient age at specimen collection (LOINC in OBX-3.1 = 35659-2 . | Patient’s date of birth. Note that the granularity of the birth date may be important. For a newborn, birth date may be known down to the minute, while for adults it may be known only to the date.  Note: If a birth date is not provided in the PID, then the patient age must be reported as an observation associated with the specimen. |
| 8 | 1..20= | IS | [1..1] | R | HL70001 | Administrative Sex |  |  | Patient’s gender. |
| 9 |  | XPN | [0..0] | X |  | Patient Alias |  |  | Not supported. |
| 10 |  | CWE\_CRE | [0..\*] | RE | HL70005 | Race |  |  | One or more codes that broadly refer to the patient’s race(s). |
| 11 |  | XAD | [0..\*] | RE |  | Patient Address |  |  |  |
| 12 | 1..20= | IS | [0..0] | X |  | County Code |  |  | Not supported.. |
| 13 |  | XTN | [0..\*] | RE |  | Phone Number – Home |  |  |  |
| 14 |  | XTN | [0..\*] | RE |  | Phone Number – Business |  |  |  |
| 15 |  |  |  | O |  | Primary Language |  |  |  |
| 16 |  |  |  | O |  | Marital Status |  |  |  |
| 17 |  |  |  | O |  | Religion |  |  |  |
| 18 |  |  |  | O |  | Patient Account Number |  |  | Use PID-3, with identifier type of ‘AN’. |
| 19 |  |  |  | X |  | SSN Number – Patient |  |  | Not supported. |
| 20 |  |  |  | X |  | Driver’s License Number – Patient |  |  | Not supported. |
| 21 |  |  |  | O |  | Mother’s Identifier |  |  |  |
| 22 |  | CWE\_CRE | [0..\*] | RE | HL70189 | Ethnic Group |  |  | . |
| 23 |  |  |  | O |  | Birth Place |  |  |  |
| 24 |  |  |  | O |  | Multiple Birth Indicator |  |  |  |
| 25 |  |  |  | O |  | Birth Order |  |  |  |
| 26 |  |  |  | O |  | Citizenship |  |  |  |
| 27 |  |  |  | O |  | Veterans Military Status |  |  |  |
| 28 |  |  |  | X |  | Nationality |  |  | Not supported. |
| 29 |  | TS\_3 | [0..1] | RE |  | Patient Death Date and Time |  |  |  |
| 30 | 1..1 | ID | [0..1] | RE | HL70136 | Patient Death Indicator |  |  | If PID-29 is valued, then this field should be populated with “Y” since the patient is known to be dead. |
| 31 |  |  |  | O |  | Identity Unknown Indicator |  |  |  |
| 32 |  |  |  | O |  | Identity Reliability Code |  |  |  |
| 33 |  | TS\_5 | [0..1] | RE |  | Last Update Date/Time |  |  |  |
| 34 |  | HD | [0..1] | C(R/RE) |  | Last Update Facility | IF PID-33 (Last Update Date/Time) is valued. |  | This is the facility that originated the demographic update. |
| 35 |  | CWE\_CRE | [0..1] | RE | PHVS\_Animal\_CDC | Species Code |  |  | Population of this field supports animal rabies testing as it relates to human rabies testing. This is a variant to HITSP where the field is not supported. If a constrained version of this guide includes support for Breed (PID-36) or Strain (PID-37), then this field would be required if Breed and or Strain is present. |
| 36 |  |  |  | O |  | Breed Code |  |  |  |
| 37 |  |  |  | O |  | Strain |  |  |  |
| 38 |  |  |  | O |  | Production Class Code |  |  |  |
| 39 |  |  |  | O |  | Tribal Citizenship |  |  |  |

## NK1 – Next of Kin Segment

If the subject of the testing is something other than a person i.e. an animal, the NK1 will document the person or organization responsible for or owning the subject. For patients who are persons, the NK1 documents the next of kin of the patient. This is particularly important for lead testing of minors, since the NK1 is used to document information about the parent or guardian. This is where the employment information for the patient is documented.

| Table 4‑7. NK1 – Next Of Kin Segment | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Condition Predicate | Conformance Statement | Description/Comments |
| 1 | 1..4 | SI | [1..1] | R |  | Set ID – NK1 |  | **ELR-033:** NK1-1 (Set ID – NK1) SHALL be valued sequentially starting with the value ‘1’ |  |
| 2 |  | XPN | [0..\*] | C(R/X) |  | Name | IF NK1-13 (Organization Name – NK1) is not valued. |  | Name of the next of kin or associated party. Multiple names for the same entity are allowed, but the legal name must be sent in the first sequence. If the legal name is not sent, the repeat delimiter must be sent in the first sequence.  If next of kin or associated party is a person use this field, otherwise, use field NK1-13 |
| 3 |  | CWE\_CRE | [0..1] | RE | HL70063 | Relationship |  |  | Description of the relationship between the next of kin/related party and the patient. It is of particular importance when documenting the parent or guardian of a child patient or the owner of an animal patient. |
| 4 |  | XAD | [0..\*] | RE |  | Address |  |  | Component that may contain the address of the next of kin/associated party. |
| 5 |  | XTN | [0..\*] | RE |  | Phone Number |  |  | Field that may contain the telephone number of the next of kin/associated party. Multiple phone numbers are allowed |
| 6 |  | XTN | [0..0] | X |  | Business Phone Number |  |  | Not supported. |
| 7 |  | CWE | [0..0] | X |  | Contact Role |  |  | Not supported. |
| 8 |  | DT | [0..0] | X |  | Start Date |  |  | Not supported. |
| 9 |  | DT | [0..0] | X |  | End Date |  |  | Not supported. |
| 10 | 1..60# | ST | [0..0] | X |  | Next of Kin / Associated Parties Job Title |  |  | Not supported. |
| 11 |  | JCC | [0..0] | X |  | Next of Kin / Associated Parties Job Code/Class |  |  | Not supported. |
| 12 |  | CX | [0..0] | X |  | Next of Kin / Associated Parties Employee Number |  |  | Not supported. |
| 13 |  | XON | [0..1] | C(R/X) |  | Organization Name – NK1 | IF NK1-2 (Name) is NOT valued. |  | If next of kin or associated party is an organization use this field, otherwise, use field NK1-2. |
| 14 |  | CWE | [0..0] | X |  | Marital Status |  |  | Not supported. |
| 15 | 1..20= | IS | [0..0] | X |  | Administrative Sex |  |  | Not supported. |
| 16 |  | TS | [0..0] | X |  | Date/Time of Birth |  |  | Not supported. |
| 17 | 1..20= | IS | [0..0] | X |  | Living Dependency |  |  | Not supported. |
| 18 | 1..20= | IS | [0..0] | X |  | Ambulatory Status |  |  | Not supported. |
| 19 |  | CWE | [0..0] | X |  | Citizenship |  |  | Not supported. |
| 20 |  |  |  | O |  | Primary Language |  |  |  |
| 21 |  |  |  | X |  | Living Arrangement |  |  | Not supported. |
| 22 |  |  |  | X |  | Publicity Code |  |  | Not supported. |
| 23 |  |  |  | X |  | Protection Indicator |  |  | Not supported. |
| 24 |  |  |  | X |  | Student Indicator |  |  | Not supported. |
| 25 |  |  |  | X |  | Religion |  |  | Not supported. |
| 26 |  |  |  | X |  | Mother’s Maiden Name |  |  | Not supported. |
| 27 |  |  |  | X |  | Nationality |  |  | Not supported. |
| 28 |  |  |  | X |  | Ethnic Group |  |  | Not supported. |
| 29 |  |  |  | X |  | Contact Reason |  |  | Not supported. |
| 30 |  | XPN | [0..\*] | C(R/X) |  | Contact Person’s Name | IF NK1-13 (Organization Name) is valued. |  |  |
| 31 |  | XTN | [0..\*] | C(RE/X) |  | Contact Person’s Telephone Number | IF NK1-13 (Organization Name) is valued |  |  |
| 32 |  | XAD | [0..\*] | C(RE/X) |  | Contact Person’s Address | IF NK1-13 (Organization Name) is valued |  |  |
| 33 |  | CX | [0..0] | X |  | Next of Kin/Associated Party’s Identifiers |  |  | Not supported. |
| 34 | 1..20= | IS | [0..0] | X |  | Job Status |  |  | Not supported. |
| 35 |  | CWE | [0..0] | X |  | Race |  |  | Not supported. |
| 36 | 1..20= | IS | [0..0] | X |  | Handicap |  |  | Not supported. |
| 37 | 1..16# | ST | [0..0] | X |  | Contact Person Social Security Number |  |  | Not supported. |
| 38 | 1..250# | ST | [0..0] | X |  | Next of Kin Birth Place |  |  | Not supported. |
| 39 | 1..20= | IS | [0..0] | X |  | VIP Indicator |  |  | Not supported. |

1

## PV1 – Patient Visit Information

This segment contains basic inpatient or outpatient encounter information.

| Table 4‑8. PV1 – Patient Visit Information | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Conformance Statement | Description/Comments |
| 1 | 1..4 | SI | [1..1] | R |  | Set ID - PV1 | **ELR-030:** PV1-1 (Set ID - PV1) SHALL contain the constant value ‘1’. |  |
| 2 | 1..20= | IS | [1..1] | R | HL70004 | Patient Class |  | A gross identification of the classification of patient’s visit |
| 3 |  |  |  | O |  | Assigned Patient Location |  |  |
| 4 | 1..20= | IS | [0..1] | RE | Admission Type Value Set | Admission Type |  |  |
| 5 |  |  |  | O |  | Preadmit Number |  |  |
| 6 |  |  |  | O |  | Prior Patient Location |  |  |
| 7 |  |  |  | O |  | Attending Doctor |  |  |
| 8 |  |  |  | O |  | Referring Doctor |  |  |
| 9 |  |  |  | O |  | Consulting Doctor |  |  |
| 10 |  |  |  | O |  | Hospital Service |  |  |
| 11 |  |  |  | O |  | Temporary Location |  |  |
| 12 |  |  |  | O |  | Preadmit Test Indicator |  |  |
| 13 |  |  |  | X |  | Re-admission Indicator |  | Not supported. |
| 14 |  |  |  | O |  | Admit Source |  |  |
| 15 |  |  |  | X |  | Ambulatory Status |  | Not supported. |
| 16 |  |  |  | X |  | VIP Indicator |  | Not supported. |
| 17 |  |  |  | O |  | Admitting Doctor |  |  |
| 18 |  |  |  | O |  | Patient Type |  |  |
| 19 |  |  |  | O |  | Visit Number |  |  |
| 20 |  |  |  | O |  | Financial Class |  |  |
| 21 |  |  |  | X |  | Charge Price Indicator |  | Not supported. |
| 22 |  |  |  | X |  | Courtesy Code |  | Not supported. |
| 23 |  |  |  | X |  | Credit Rating |  | Not supported. |
| 24 |  |  |  | X |  | Contract Code |  | Not supported. |
| 25 |  |  |  | X |  | Contract Effective Date |  | Not supported. |
| 26 |  |  |  | X |  | Contract Amount |  | Not supported. |
| 27 |  |  |  | X |  | Contract Period |  | Not supported. |
| 28 |  |  |  | X |  | Interest Code |  | Not supported. |
| 29 |  |  |  | X |  | Transfer to Bad Debt Code |  | Not supported. |
| 30 |  |  |  | O |  | Transfer to Bad Debt Date |  |  |
| 31 |  |  |  | O | HL70021 | Bad Debt Agency Code |  |  |
| 32 |  |  |  | O |  | Bad Debt Transfer Amount |  |  |
| 33 |  |  |  | O |  | Bad Debt Recovery Amount |  |  |
| 34 |  |  |  | O | HL70111 | Delete Account Indicator |  |  |
| 35 |  |  |  | O |  | Delete Account Date |  |  |
| 36 |  |  |  | O | HL70112 | Discharge Disposition |  |  |
| 37 |  |  |  | O |  | Discharged to Location |  |  |
| 38 |  |  |  | O | HL70114 | Diet Type |  |  |
| 39 |  |  |  | O | HL70115 | Servicing Facility |  |  |
| 40 |  |  |  | X |  | Bed Status |  | Not supported |
| 41 |  |  |  | O | HL70117 | Account Status |  |  |
| 42 |  |  |  | O |  | Pending Location |  |  |
| 43 |  |  |  | O |  | Prior Temporary Location |  |  |
| 44 |  | TS\_5 | [0..1] | RE |  | Admit Date/Time |  | Date and time patient arrived for services |
| 45 |  | TS-5 | [0..1] | RE |  | Discharge Date/Time |  | Date and time patient services ended |
| 46 |  |  |  | O |  | Current Patient Balance |  |  |
| 47 |  |  |  | O |  | Total Charges |  |  |
| 48 |  |  |  | O |  | Total Adjustments |  |  |
| 49 |  |  |  | O |  | Total Payments |  |  |
| 50 |  |  |  | O |  | Alternate Visit ID |  |  |
| 51 |  |  |  | O | HL70326 | Visit Indicator |  |  |
| 52 |  |  |  | X |  | Other Healthcare Provider |  | Not supported. |

1

## ORC – Common Order Segment

The Common Order Segment (ORC) identifies basic information about the order for testing of the specimen. This segment includes identifiers for the order, who placed the order, when it was placed, what action to take regarding the order, etc.

| Table 4‑9. ORC – Common Order Segment | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Condition Predicate | Conformance Statement | Description/Comments |
| 1 | 2..2 | ID | [1..1] | R | HL70119 | Order Control |  | **ELR-034:** ORC-1 (Order Control) SHALL contain the constant value ‘RE'. |  |
| 2 |  | EI | [0..1] | RE |  | Placer Order Number | IF OBR-2 (Placer Order Number) within same Order\_Observation Group is valued. | **ELR-035:** ORC-2 (Placer Order Number) SHALL be the same value as OBR-2 within same Order\_Observation Group. | If OBR-2 Placer Order Number is populated; this field must contain the same value as OBR-2. |
| 3 |  | EI | [1..1] | R |  | Filler Order Number |  | **ELR-036:** ORC-3 (Filler Order Number) SHALL be the same value as OBR-3 (Filler Order Number) within same Order\_Observation Group. | This field must contain the same value as OBR-3 Filler Order Number.  Note: In the circumstance where some of the lab results are generated by the lab, but others are performed by a reference lab, the sending lab can choose what filler order number to use, but whatever is used, the sending lab is expected to be able to trace all the observations in the lab result back to the appropriate source lab based on the filler order number provided in ORC-3. |
| 4 |  | EI | [0..1] | RE |  | Placer Group Number |  |  | The placer group number is used to identify a group of orders. In the laboratory setting this is commonly referred to as a "requisition number." |
| 5 |  |  |  | O |  |  |  |  |  |
| 6 |  |  |  | O |  | Response Flag |  |  |  |
| 7 |  |  |  | X |  | Quantity/Timing |  |  | Not supported. |
| 8 |  |  |  | O |  | Parent |  |  |  |
| 9 |  |  |  | O |  | Date/Time of Transaction |  |  |  |
| 10 |  |  |  | O |  | Entered By |  |  |  |
| 11 |  |  |  | O |  | Verified By |  |  |  |
| 12 |  | XCN | [1..1] | R |  | Ordering Provider |  | **ELR-037:** ORC-12 (Ordering Provider) SHALL be the same value as OBR-16 within same Order\_Observation Group. |  |
| 13 |  |  |  | O |  | Enterer's Location |  |  |  |
| 14 |  | XTN | [0..2] | C(R/X) |  | Call Back Phone Number | IF OBR-17 (Order Callback Phone Number) within same Order\_Observation Group is valued. | **ELR-038:** ORC-14 (Call Back Phone Number) SHALL be the same value as OBR-17 within same Order\_Observation Group. | If OBR-17 Callback Phone Number is populated, this field will contain the same value. This should be a phone number associated with the original order placer. |
| 15 |  |  |  | O |  | Order Effective Date/Time |  |  |  |
| 16 |  |  |  | O |  | Order Control Code Reason |  |  |  |
| 17 |  |  |  | O |  | Entering Organization |  |  |  |
| 18 |  |  |  | O |  | Entering Device |  |  |  |
| 19 |  |  |  | O |  | Action By |  |  |  |
| 20 |  | CWE | [0..0] | X |  | Advanced Beneficiary Notice Code |  |  | Not supported. |
| 21 |  | XON | [1..1] | R |  | Ordering Facility Name |  |  |  |
| 22 |  | XAD | [1. 1] | R |  | Ordering Facility Address |  |  | The address of the facility where the order was placed.  ELR Cardinality: ELR supports a single ordering facility address |
| 23 |  | XTN | [1..\*] | R |  | Ordering Facility Phone Number |  |  |  |
| 24 |  | XAD | [0..\*] | RE |  | Ordering Provider Address |  |  | The address of the ordering provider. |
| 25 |  |  |  | O |  | Order Status Modifier |  |  |  |
| 26 |  |  |  | X |  | Advanced Beneficiary Notice Override Reason |  |  | Not supported. |
| 27 |  |  |  | O |  | Filler's Expected Availability Date/Time |  |  |  |
| 28 |  |  |  | O |  | Confidentiality Code |  |  |  |
| 29 |  |  |  | O |  | Order Type |  |  |  |
| 30 |  |  |  | O |  | Enterer Authorization Mode |  |  |  |
| 31 |  |  |  | O |  | Parent Universal Service Identifier |  |  |  |

## OBR – Observation Request Segment

The Observation Request Segment (OBR) is used to capture information about one test being performed on the specimen. Most importantly, the OBR identifies the type of testing to be performed on the specimen and ties that information to the order for the testing.

| Table 4‑10. OBR – Observation Request Segment | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Condition Predicate | Conformance Statement | Description/Comments |
| 1 | 1..4 | SI | [1..1] | R |  | Set ID ‑ OBR |  | **ELR-039:** OBR-1 (Set ID ‑ OBR) SHALL be valued sequentially starting with the value ‘1’ |  |
| 2 |  | EI | [0..1] | RE |  | Placer Order Number |  |  | This identifier is assigned by the placer of the order being fulfilled by this result message. This identifier distinguishes the placer’s order from all other orders created by the placer where an order is interpreted to be the testing identified in a single OBR segment. Normally, it is a type of system identifier assigned by the placer software application.  The Placer Order Number and the Filler Order Number are essentially foreign keys exchanged between applications for uniquely identifying orders and the associated results across applications. |
| 3 |  | EI | [1..1] | R |  | Filler Order Number |  | **ELR-040:** OBR-3 (Filler Order Number) SHALL NOT contain the same value as another occurrence of OBR-3 (Filler Order Number) in the message. | Order number associated with the Filling Application. This number is assigned to the test by the organization performing the test. The Filler Order Number identifies this order as distinct from all other orders being processed by this filler where an order is interpreted to be the testing identified in a single OBR segment. Normally, this is a type of system identifier assigned by the filler software application.  The Filler Order Number, along with the Placer Order Number, is essentially foreign keys exchanged between applications for uniquely identifying orders and the associated results across applications.  In messages containing multiple OBRs, each OBR must be identified by a unique Filler Order Number. |
| 4 |  | CWE\_CR | [1..1] | R | Logical  Observation  Identification  Name and  Codes (LOINC)  For reportable lab tests use ELR Reportable Laboratory Observation Identifier Value Set.  . | Universal Service Identifier |  |  | LOINC should be used as the standard coding system for this field if an appropriate LOINC code exists. Appropriate status is defined in the LOINC Manual Section 11.2 Classification of LOINC Term Status. If a local coding system is in use, a local code should also be sent to help with identification of coding issues. When no valid LOINC exists the local code may be the only code sent.  When populating this field with values, this guide does not give preference to the triplet in which the standard (LOINC) code should appear. |
| 5 |  |  |  | X |  | Priority – OBR |  |  | Not supported. |
| 6 |  |  |  | X |  | Requested Date/Time |  |  | Not supported. |
| 7 |  | TS\_4 | [1..1] | R |  | Observation Date/Time |  |  | For specimen-based observations, the date/time the specimen was collected. A minimum of year, month and day must be provided when the actual date/time is known. For unknown collection date/time use "0000". If the SPM is sent, this field must contain the same value as the first component of SPM-17 Specimen Collection Date/Time. HL7 requires this field in an OBR in a result message. For OBXs related to this OBR and related to the testing of a specimen, OBX-14 (Date/Time of the Observation) shall contain the same value as this field. |
| 8 |  | TS\_5 | [0..1] | C(R/X) |  | Observation End Date/Time | IF SPM-17.2 is valued. | ELR-0NN: If present, OBR-8 (Observation End Date/Time) SHALL be equal or later than OBR-7 (Observation Date/Time). | For specimen-based observations where the specimen was collected over a period of time, this represents the end point in time when the specimen was collected.  This field must contain the same value as the second component of SPM-17 Specimen Collection Date/Time. |
| 9 |  |  |  | X |  | Collection Volume |  |  | Not supported.. |
| 10 |  |  |  | O |  | Collector Identifier |  |  |  |
| 11 | 1..1 | ID | [0..1] | RE | HL70065 V271(Constrained) See Table 6-n | Specimen Action Code |  |  | When OBR-11 is valued “G” - Generated or Reflex Order, OBR-29 becomes required. See section *4.9.1.1 Reporting a Microbiology Culture with Susceptibility* |
| 12 |  |  |  | O |  | Danger Code |  |  |  |
| 13 | 300= | ST | [0..1] | RE |  | Relevant Clinical Information |  |  |  |
| 14 |  |  |  | X |  | Specimen Received Date/Time |  |  | Not supported. |
| 15 |  |  |  | X |  | Specimen Source |  |  | Not supported. |
| 16 |  | XCN | [1..1] | R |  | Ordering Provider |  |  | Identifier of the provider who ordered the testing being performed. The National Provider Identifier (NPI) may be used as the identifier. NPI root OID is “ 2.16.840.1.113883.4.6”  Note that ORC.12 Ordering Provider is constrained to contain the same value as this field. |
| 17 |  | XTN | [0..2] | RE |  | Order Callback Phone Number |  |  | This is the number the laboratory can call with questions regarding the order. This should be a phone number associated with the original order placer. Note that ORC.14 Call Back Phone Number is constrained to contain the same value as this field. |
| 18 |  |  |  | O |  | Placer Field 1 |  |  |  |
| 19 |  |  |  | O |  | Placer Field 2 |  |  |  |
| 20 |  |  |  | O |  | Filler Field 1 |  |  |  |
| 21 |  |  |  | O |  | Filler Field 2 |  |  |  |
| 22 |  | TS\_6 | [1..1] | R |  | Results Rpt/Status Chng - Date/Time |  |  | Required field in this message. Applies to the entire report. Receipt of a subsequent message with the same Filler Number and a different status in this field implies that processing may need to occur at the receiving application level to update a previous report. |
| 23 |  |  |  | O |  | Charge to Practice |  |  |  |
| 24 |  |  |  | O | HL70074 | Diagnostic Serv Sect ID |  |  |  |
| 25 | 1..1 | ID | [1..1] | R | HL70123 (constrained) | Result Status |  |  |  |
| 26 |  | PRL | [0..1] | C(R\RE) |  | Parent Result | If OBR-11 (Specimen Action Code) is valued “G” |  | This field together with OBR-29 Parent, allows this result to be linked to a specific OBX segment associated with another OBR segment. See 4.9.1.1 Reporting a Microbiology Culture with Susceptibility and Section *7.1.1.3 Detailed Explanation of How Parent/Child Result Linking Works,* for more information on linking parent/child results. |
| 27 |  |  |  |  |  | Quantity/Timing |  |  | Not supported.. |
| 28 |  | XCN | [0..\*] | C(R/X) |  | Result Copies To | : If CWE\_CRE.1 (Identifier) or CWE\_CRE.4 (Alternate Identifier) of at least one occurrence of OBR-49 is valued CC or BCC |  |  |
| 29 |  | EIP | [0..1] | C(R/RE) |  | Parent | If OBR-11 (Specimen Action Code) is valued “G” |  | Used to link this OBR with a parent OBR for reflex and culture and susceptibility testing See *7.1.1.3 Detailed Explanation of How Parent/Child Result Linking Works,* for more information on linking parent/child results. |
| 30 |  |  |  | X |  | Transportation Mode |  |  | Not supported. |
| 31 |  | CWE\_CRE | [0..\*] | RE | Reason For Study Value Set | Reason for Study |  |  | We know ICD9 is used today, but we will allow ICD10 when the US starts using it. |
| 32 |  | NDL | [0..1] | RE |  | Principal Result Interpreter |  |  | Used for pathology results. |
| 33 |  |  |  | O |  | Assistant Result Interpreter |  |  |  |
| 34 |  |  |  | O |  | Technician |  |  |  |
| 35 |  |  |  | O |  | Transcriptionist |  |  |  |
| 36 |  |  |  | O |  | Scheduled Date/Time |  |  |  |
| 37 |  |  |  | X |  | Number of Sample Containers |  |  | Not supported. |
| 38 |  |  |  | X |  | Transport Logistics of Collected Sample |  |  | Not supported. |
| 39 |  |  |  | O |  | Collector's Comment |  |  |  |
| 40 |  |  |  | X |  | Transport Arrangement Responsibility |  |  | Not supported. |
| 41 |  |  |  | X |  | Transport Arranged |  |  | Not supported. |
| 42 |  |  |  | X |  | Escort Required |  |  | Not supported. |
| 43 |  |  |  | X |  | Planned Patient Transport Comment |  |  | Not supported. |
| 44 |  |  |  | O |  | Procedure Code |  |  |  |
| 45 |  |  |  | O | HL70340 | Procedure Code Modifier |  |  |  |
| 46 |  |  |  | O | HL70411 | Placer Supplemental Service Information |  |  |  |
| 47 |  |  |  | O | HL70411 | Filler Supplemental Service Information |  |  |  |
| 48 |  |  |  | O | HL70476 | Medically Necessary Duplicate Procedure Reason |  |  |  |
| 49 |  | CWE\_CRE | [0..\*]] | RE | HL70507 | Result Handling |  |  |  |
| 50 |  |  |  | O |  | Parent Universal Service Identifier |  |  |  |

Implementation Note: In the circumstance where some of the lab results are generated by the lab, but others are performed by a reference lab, the sending lab can choose what filler order number to use., Whichever filler order number is used, the sending lab is expected to be able to trace all the observations in the lab result back to the appropriate source lab based on the filler order number provided in OBR-3.

#### Reporting a Microbiology Culture with Susceptibility

The approach described here is required for use in reporting microbiology results for the profiles supported in this guide. Additional implementation guidance for Parent/Child reporting for reflex and culture susceptibility testing is given in section 7.1 below.

Report a microbiology culture with susceptibility where:

1) the parent result contains the culture result including an OBX identifying an organism AND

2) the child result contains a susceptibility battery linked to the organism identified in the parent result.

The following conformance statements are intended to support these requirements.

**Conformance Statements: LRI\_Base Profile**

**ELR-NN:** The implementer **SHALL** report microbiology results as follows:

**PART A:** The ORU^R01 SHALL contain One (1..1) ORDER\_OBSERVATION group containing one (1..1) OBR with OBR-4 field populated with a code for a Culture with Susceptibility

AND

**PART B:** one or more (1..\*) OBSERVATION groups containing an OBX segment with OBX-3 field populated with a code indicating the identification of an organism

AND

**PART C:** One or more (1..\*) additional ORDER\_OBSERVATION groups each containing:

**PART C1:** one (1..1) OBR with OBR-4 field populated with a code for Susceptibility battery and OBR-11 field populated with the value “G” and OBR-26 valued such that it links to one of the OBX segments in **PART B**

AND

**PART C2:** one or more (1..\*) OBSERVATION groups containing an OBX segment with OBX-3 field populated with a code for a specific antibiotic susceptibility

## TQ1 – Timing/Quantity Segment

The TQ1 segment is used to specify the timing of events and actions such as those that occur in order management and scheduling systems.

| Table 4‑11. TQ1 – Timing/Quantity Segment | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Conformance Statement | Description/Comments |
| 1 | 1..4 | SI | [1..1] | R |  | Set ID - TQ1 | ELR-NNN: The value of TQ1-1 (Set ID – TQ1) SHALL be valued sequentially starting the value ‘1’ within a given segment group. | Sequence number of the timing specification, the first of which shall be 1; the second of which shall be 2; and so on. |
| 2 |  |  |  | O |  | Quantity |  |  |
| 3 |  |  |  | O |  | Repeat Pattern |  |  |
| 4 |  |  |  | O |  | Explicit Time |  |  |
| 5 |  |  |  | O |  | Relative Time and Units |  |  |
| 6 |  |  |  | O |  | Service Duration |  |  |
| 7 |  | TS | [0..1] | RE |  | Start date/time |  | Field that may be specified by the requester, in which case it indicates the earliest date/time at which the services should be started. In many cases, however, the start date/time will be implied or will be defined by other fields in the service request record (*e.g.*, urgency - STAT).  The filling service may record a value in this field after receipt of the service request. |
| 8 |  | TS | [0..1] | RE |  | End date/time |  |  |
| 9 |  |  |  | O | HL70485 | Priority |  |  |
| 10 |  |  |  | O |  | Condition text |  |  |
| 11 |  |  |  | O |  | Text instruction |  |  |
| 12 |  |  |  | X |  | Conjunction |  |  |
| 13 |  |  |  | O |  | Occurrence duration |  |  |
| 14 |  |  |  | O |  | Total occurrence's |  |  |

## OBX – Observation/Result Segment

The Observation/Result Segment (OBX) contains information regarding a single observation related to a single test (OBR) or specimen (SPM). This includes identification of the specific type of observation, the result for the observation, when the observation was made, etc.

| Table 4‑12. OBX – Observation/Result Segment | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Condition Predicate | Conformance Statement | Description/Comments |
| 1 | 1..4 | SI | [1..1] | R |  | Set ID – OBX |  | **ELR-048:** OBX-1 (Set ID – OBX) SHALL be valued sequentially starting with the value ‘1’ within a given Order\_Observation Group. (OBX following the OBR).  **ELR-068:** OBX-1 (Set ID – OBX) SHALL be valued sequentially starting with the value ‘1’ within a given Specimen Group (OBX following the SPM). |  |
| 2 | 2..3 | ID | [0..1] | C(R/X) | HL70125 ( constrained) See Table 6-n. | Value Type | IF OBX-5 (Observation Value) is valued. |  | This field identifies the data type used for OBX-5. |
| 3 |  | CWE\_CR | [1..1] | R | Logical  Observation  Identification  Name and  Codes (LOINC).  -See Description and Comments for further guidance. | Observation Identifier |  |  | LOINC shall be used as the standard coding system for this field if an appropriate LOINC code exists. Appropriate status is defined in the LOINC Manual Section 11.2 Classification of LOINC Term Status. If a local coding system is in use, a local code should also be sent to help with identification of coding issues. When no valid LOINC exists the local code may be the only code sent.  When populating this field with values, this guide does not give preference to the triplet in which the standard (LOINC) code should appear.  For reportable lab tests use ELR Reportable Laboratory Observation Identifier Value Set.  For additional demographic information use Epideimiologically important information Value Set |
| 4 | 1..20= | ST | [0..1] | C(R/RE) |  | Observation Sub-ID | If there are multiple OBX segments associated with the same OBR segment that have the same OBX-3 (Observation Identifier) values for (OBX-3.1 and OBX-3.3) or (OBX-3.4 and OBX-3.6). |  | Normally, this field is populated with a number, but text values may be used also. |
| 5 |  | Var | [0..1] | C(RE/X) | Varies | Observation Value | IF OBX-11 (Observation Result Status) is not valued 'X'. | **ELR-065:** OBX-5(Observation Value) Must be valued IF OBX-8 (Abnormal Flags) is empty AND OBX-11 (Observation Result Status) is not valued ‘X’. | Field that documents each specific, allowed data type. See Section *, HL7 Table 0125* for the data types that will be supported for this field.  Either OBX-5 or OBX-8 (Abnormal flags) must be present in the message except if OBX-11 is ‘X”, result cannot be obtained.[[6]](#footnote-6)  For coded results: use SNOMED CT  For reportable coded nominal test results use: ELR Reportable Coded Observation Value Set  For coded ordinal test results use: ELR Ordinal Value Set for Qualitative Results |
| 6 |  | CWE\_CRE | [0..1] | C(R/RE) | Unified Code for Units of Measure (UCUM) | Units | IF OBX-2 (Value Type) is valued 'NM’, 'SN' AND OBX-11 (Observation Result Status ) is not valued 'X'. |  | **Note:** If there is not a unit of measure available while the Condition Predicate is True, the value “NA” shall be used in CWE\_CRE.1 and “HL70353” in CWE\_CRE.3  **Note:** UCUM (Unified Code for Units of Measure) will be evaluated during the pilot for potential subsequent inclusion. As part of the pilot test, for dimensionless units the UCUM representation could be {string}, e.g., for titer the pilot might use {titer} to test feasibility. When sending units of measure as text, they must be placed in the correct component of OBX-6 (CWE\_CRE.9). |
| 7 | 1..60= | ST | [0..1] | RE |  | References Range |  |  | Interpretation range that applies to the value reported in OBX-5. It should provide enough information to understand the abnormal flags reported in OBX-8.  Note-It is not appropriate to send the reference range for a result in an associated NTE segment. It would be appropriate to send information amplifying the reference range provided in this field in an NTE associated with this OBX. |
| 8 |  | CWE\_CRE | [0..\*] | C(RE/X) | HL70078 (Constrained V2.7.1), see Table 6-n for value  set. | Interpetation Codes | IF OBX-11 (Observation Result Status) is not valued 'X'. | **ELR-066:** OBX-8 (Abnormal Flags) Must be valued IF OBX-5 (Observation Value) is empty AND OBX-11 (Observation Result Status) is not valued ‘X’. | Indicator of the normalcy of the result found in OBX-5. Cardinality indicates the possible need for multiple abnormal flags, as in the following example: *Example: Hemoglobin has a normal range of 12-16  Initial result (reported in a separate ORU message based on testing an earlier specimen): HGB = 15.9 (results normal)  Current result (in this OBX based on current specimen): HGB = 11.9 abnormality: (L) below low normal and a (D) significant change down (delta > 3).*  In this example, OBX-8 would be set to |*L^* Below low normal ^2.16.840.1.113883.12.78~D^Significant change down ^2.16.840.1.113883.12.78|.  Microbiology example:  Ceftazidime susceptibility (LOINC 133-9) value = |<=^1|, units = ug/ml, Abnormal flag = S  Either OBX-5 (Observation Value) or OBX-8 must be present in the message except if OBX-11 is ‘X”, result cannot be obtained. |
| 9 |  |  |  | O |  | Probability |  |  |  |
| 10 |  |  |  | O |  | Nature of Abnormal Test |  |  |  |
| 11 | 1..1 | ID | [1..1] | R | HL70085 | Observation Result Status |  |  | Status of the observation result. |
| 12 |  |  |  | O |  | Effective Date of Reference Range |  |  |  |
| 13 |  |  |  | O |  | User-Defined Access Checks |  |  |  |
| 14 |  | TS\_5 | [0..1] | RE |  | Date/Time of the Observation |  | **ELR-051:** OBX-14 (Date/Time of the Observation) For observation related to testing of specimen (OBX's following the OBR), SHALL be identical to OBR-7 (Observation Date/Time) value within the same Order\_Observation Group. | The date/time of observation is intended to carry the clinically relevant time of the observation. For specimen-based laboratory reporting, the specimen collection date and time. For observations carried out directly on a patient for instance, such as a blood pressure, the time the observation was performed also happens to be the clinically relevant time of the observation.  The date/time the testing was performed should be reported in OBX-19  For observations related to the testing of a specimen, OBX-14 (Date/Time of the Observation) shall contain specimen collection time and will be the same value as OBR-7 and SPM-17.1.  Note that in the past; OBX-14 was often used to carry the time of testing a specimen, even though HL7 clearly stated it should be the specimen collection date/time in that case. In this IG, the time the testing was performed will be carried in OBX-19, and OBX-14 will be used for its HL7 intended purpose. Previous version of HL7 did not contain OBX-19. |
| 15 |  |  |  | O |  | Producer’s ID |  |  | If populated the field must identify the same performing organization as that identified in OBX-23 (Performing Organization Name). |
| 16 |  |  |  | O |  | Responsible Observer |  |  |  |
| 17 |  | CWE\_CRE | [0..\*] | RE | HL7 V3 Observation Method | Observation Method |  |  | Method of testing by the laboratory. If the LOINC code in OBX-3 is methodless, this field shall be populated. Sometimes the method may be extrapolated from the local test codes. |
| 18 |  |  |  | O |  | Equipment Instance Identifier |  |  |  |
| 19 |  | TS\_5 | [0..1] | RE |  | Date/Time of the Analysis |  |  | Time at which the testing was performed.  Note that in the past (in v2.3.1 for example); OBX-14 was often used to carry the time of testing a specimen, even though HL7 clearly stated it should be the specimen collection date/time in that case. In this IG, the time the testing was performed will be carried in OBX-19, and OBX-14 will be used for its HL7 intended purpose. |
| 20 |  | (TBD) | [0..0] | X |  | Reserved for harmonization with *Version 2.6.* |  |  | Not supported. |
| 21 |  | (TBD) | [0..0] | X |  | Reserved for harmonization with *Version 2.6*. |  |  | Not supported. |
| 22 |  | (TBD) | [0..0] | X |  | Reserved for harmonization with *Version 2.6*. |  |  | Not supported. |
| 23 |  | XON | [1..1] | R |  | Performing Organization Name |  |  | The information for producer ID is recorded as an XON data type.  For laboratories, this field specifies the laboratory that produced the test result described in this OBX segment. This information supports CLIA regulations in the US. For producing laboratories that are CLIA-certified, the CLIA identifier should be used for the organization identifier (component 10). |
| 24 |  | XAD | [1..1] | R |  | Performing Organization Address |  |  | Address of the laboratory that actually performed the test. |
| 25 |  | XCN | [0..1] | RE |  | Performing Organization Medical Director |  |  | Name of the Medical Director of the reference laboratory. . |

### Usage Note

An OBX Can reflects a an actual result for the test requested, additional information such as ask at order entry responses, or other epidemiologically important information or observations related to the specimen.

For OBX-17 (Observation Method): This can be useful to further specify information about the specific method to a more granular level than what is defined by the LOINC used in OBX-3. There are two vocabularies available for use at this time, SNOMED procedure hierarchy codes and V3 Observation Method codes, and work to make these more complete as well as to provide a cross-mapping between them is in development.

### Observation Identifiers, Observation Values, Interpretations and Comments

Laboratory results fall into several broad categories or types of results. The first type of result is a quantitative measure of some property of a specimen and is typically numerical in nature. Often these numeric results are also associated with some sort of interpretation, typically in terms of the normality or abnormality of the measured quantity in relationship to a reference range or normal range. Another type of result is a qualitative result related to the testing of a specimen. This is typically coded or textual in nature. Qualitative results may actually be interpretations of more detailed quantitative measurement (see Section 7.4 CLSI Definitions – Quantitative, Semi-quantitative, Qualitative Results). Both quantitative and qualitative results may have comments associated with them. These comments may provide additional clarification, information regarding how the result was obtained, etc.

This guide assumes that LOINC is normally being used for the identification of observations if an appropriate LOINC code exists. Appropriate status is defined in the LOINC Manual Section 11.2 Classification of LOINC Term Status. LOINC identifiers can easily be classified as quantitative or qualitative. The LOINC scale property QN (quantitative) indicates that the LOINC identifier is quantitative. All other LOINC identifiers can be treated as qualitative for the purpose of this discussion. Those OBX’s associated with quantitative LOINC identifiers should be using OBX-5 with either the NM (numeric), SN (structured numeric), TS (timestamp), DT (date) or TM (time) data types. These quantitative results can be accompanied by an interpretation. Coded interpretations should be reported using OBX-8 (abnormal flags) when the values have been drawn from HL7 table 0078.

The LOINC scale property for qualitative results can fall into four types:

1. Ordinal (ORD): OBX-3 observations with qualitative LOINC test codes using ordinal result scales may fully specify the analyte/component measured in OBX-3, thus only requiring a “Presence/Absence” code to fully specify the observation.
2. Nominal (NOM): OBX-3 observations with "presence or identity" LOINC test codes using nominal result scales to fully specify the observation.
   * Bacterial cultures may require a SNOMED CT concept from the "organism" hierarchy
3. Narrative (NAR): OBX-3 observations with narrative LOINC test codes use ST or TX data type in OBX-5.
4. Ordinal or Quantitative (OrdQn): This type is used by Susceptibility tests that may be reported as qualitative (i.e. susceptible, resistant) or as quantitative, numeric results (e.g. Minimum Inhibitory Concentration MIC).

Both quantitative and qualitative results may have comments associated with them. These comments may provide additional clarification, information regarding how the result was obtained, etc.

In laboratory test result reporting, the semantic relationship between OBX-3 (Observation Identifier) and OBX-5 (Observation Value) is that the asserted value in OBX-5 "refines" or "qualifies" the meaning of the laboratory test that is specified in OBX-3. In other words how a particular result should be reported using the OBX segment above depends upon what is being used as an observation identifier for OBX-3. This is true regardless of whether SNOMED-CT is used. When SNOMED CT is used for a coded result value in OBX-5, this understanding of the semantic relationship is consistent with the use of qualifiers and refinement as specified in the SNOMED CT Concept Model. It supports the use of SNOMED CT concepts (codes) from the "qualifier value" or another appropriate SNOMED CT hierarchy matching the "semantic type" of the laboratory test specified by the LOINC code in OBX-3 for Microbiology results. These result value concepts may specify a presence/absence value, an organism name or an organism-related substance (e.g. toxin, RNA, DNA, antigen).

The above discussion has focused on actual clinical findings, whether they are quantitative or qualitative. Often, additional clarifying documentation is sent along with the clinical findings. These should be handled as comments, conveyed in an NTE segment(s) following the OBX in question. Comments typically fall into the following categories:

* Comments about how a clinical finding was reached
* Clarification regarding the meaning of a clinical finding
* Additional information not directly related to the clinical finding such as contact information for the lab, disclaimers, etc.
* Most canned, or boiler plate text associated with a result falls into the comment category.

The following table gives examples of how the different fields in the OBX segment interact to create the complete observation.

.

| Table 4‑13 | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Testing situation Discussion | OBX.2 Observation Type | OBX.3 Observation Identifier: LOINC part = scale | OBX.5 Observation value | OBX.6 Units | OBX.8 Abnormal Flags | OBX.7 Reference Range | NTE Segment |
| Numeric result | NM | QN | number | UCUM Units required | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Numerical intervals, ratios, inequalities | SN | QN | structured numeric | UCUM Units required | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Time like quantitative result | TS, TM, DT, | QN | timestamp, time or date | [empty] | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Ordinal result | CWE | ORD | For coded Ordinal test results use: ELR Ordinal Value Set for Qualitative Results. | [empty] | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Ordinal result | SN | ORD | Ordinal as structured numeric | UCUM Units required | May be populated with coded interpretation from HL7 table 0078 | Required | May be populated with comments, not clinical findings. |
| Conveys numeric or ordinal value | NM | ORDQN | Number | Required unless OBX-11 = ‘X’ \*\* | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Conveys numeric or ordinal value | CWE | ORDQN | For coded Ordinal test results use: ELR Ordinal Value Set for Qualitative Results. | [empty] | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings |
| Conveys observation | CWE | NOM | For coded results, SNOMED CT. For reportable coded nominal test results use: ELR Reportable Coded Observation Value Set. If a suitable SNOMED CT does not exist, then use a local code. | [empty] | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Conveys observation | FT, TX or ST | NAR | text | [empty] | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Conveys observation | FT, TX or ST | MULTI | text | [empty] | May be populated with coded interpretation from HL7 table 0078 | May be populated | May be populated with comments, not clinical findings. |
| Conveys imbedded object (ED) or pointer to object (RP) | ED, RP | \* | Object pointer or imbedded object | [empty] | [empty] | [empty] | May be populated with comments, not clinical findings. |

\*At this time it is not yet clear how LOINC supports inclusion of documents. We anticipate having clarity by the time this document is moved to a normative state.

\*\* When using SN or NM to report ordinal values where there are no appropriate units of measure, use of the CWE status ‘NA’ for CWE.1 and ‘HL7 0353’ for CWE.3 is allowed, indicating there are no applicable units of measure. See OBX-6 in Table 5-12 above.

Usage Note

If either OBX-3.3 or OBX-3.6 is “LN” (LOINC) then the data type identified in OBX-2 should be drawn from Table 3‑15. Data Types for LOINC Scale Part based on the LOINC Scale Part of the code in OBX-3.1 or OBX-3.4, except when OBX-11 equals “X” or “N”.

| Table 4‑14. Data Types for LOINC Scale Part | |
| --- | --- |
| LOINC Scale Part | OBX-2 Value Type |
| QN - Quantitative | NM, SN, TS, TM, DT |
| ORD - Ordinal | CWE, SN |
| NOM – Nominal | CWE |
| NAR – Narrative | FT, TX or ST |
| ORDQN - Quantitative or Ordinal | NM, SN, TS, TM, DT, CWE |
| MULTI - Multi | FT, TX or ST |

## SPM – Specimen Segment

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

| Table 4‑15. SPM – Specimen Segment | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Conformance Statement | Description/Comments |
| 1 | 1..4 | SI | [1..1] | R |  | Set ID – SPM | **ELR-054:** SPM-1 (Set ID – SPM) SHALL contain the constant value ‘1’. | This profile supports a single SPM segment. for each Order\_Observation Group. . |
| 2 |  | EIP | [1..1] | R |  | Specimen ID |  | Unique identifier for the specimen as referenced by the Placer application, the Filler application, or both.  Note that the specimen id is not the same thing as the placer/filler order number. Order numbers identify the specific test to be performed on a specimen. A particular specimen may be associated with multiple orders (and multiple placer/filler order numbers). The specimen id may be the same as an accession number, depending on how the particular lab assigns accession numbers. |
| 3 |  |  |  | O |  | Specimen Parent IDs |  |  |
| 4 |  | CWE\_CRE | [1..1] | R | Specimen Type Value Set | Specimen Type |  | Description of the precise nature of the entity that is the source material for the observation. Either HL70487 or SNOMED CT Specimen hierarchy codes may be used, However SNOMED CT is recommended. It should be noted that in the future SNOMED CT Specimen hierarchy may become the only recommended value set so trading partners should consider moving in that direction. |
| 5 |  | CWE\_CRE | [0..\*] | RE | PHVS\_ModifierOrQualifier\_CDC | Specimen Type Modifier |  | Allows sending qualifiers for a SNOMED CT term from a single axis. Only used if SPM-4 is a SNOMED CT code. |
| 6 |  | CWE\_CRE | [0..\*] | RE | HL70371 | Specimen Additives |  |  |
| 7 |  | CWE\_CRE | [0..1] | RE | Specimen Collection Method Value Set | Specimen Collection Method |  | Method used to collect the specimen. |
| 8 |  | CWE\_CRE | [0..1] | RE | Body Site Value Set | Specimen Source Site |  | Source from which the specimen was obtained. For environmental samples, this may describe the location of the source of the specimen. For biological samples, it may represent the anatomical site from which the specimen was collected. |
| 9 |  | CWE\_CRE | [0..\*] | RE | PHVS\_ModifierOrQualifier\_CDC | Specimen Source Site Modifier |  | Modifier or qualifier for the specimen source site (SPM-8). Allows sending qualifiers for a SNOMED CT term from a single axis. Only used if SPM-8 is a SNOMED code. This allows use of post-coordinated terminologies for specimen source. |
| 10 |  |  |  | O |  | Specimen Collection Site |  |  |
| 11 |  | CWE\_CRE | [0..\*] | RE | HL70369 | Specimen Role |  |  |
| 12 |  | CQ | [0..1] | RE | Unified Code for Units of Measure (UCUM) | Specimen Collection Amount |  | Amount of sample collected. This can be reported as a volume or a weight/mass. |
| 13 |  |  |  | O |  | Grouped Specimen Count |  |  |
| 14 |  |  |  | O |  | Specimen Description |  |  |
| 15 |  |  |  | O |  | Specimen Handling Code |  |  |
| 16 |  |  |  | O |  | Specimen Risk Code |  |  |
| 17 |  | DR | [1..1] | R |  | Specimen Collection Date/Time | **ELR-057:** SPM-17.1 (Range Start Date/Time) SHALL be identical to OBR-7 (Observation Date/Time) value within the same Order\_Observation Group.  **ELR-059:** SPM-17.2 (Range End Date/Time) SHALL be identical to OBR-8 (Observation End Date/Time) value within the same Order\_Observation Group. | Time range over which the sample was collected, as opposed to the time the sample collection device was recovered. The first component of the date range must match OBR-7 Observation Date/Time. The second component must match OBR-8 Observation End Date/Time. For OBXs reporting observations based on this specimen,( i.e. the OBX following the OBR ), OBX-14 should contain the same value as component 1 of this field.  A minimum of year, month and day must be provided when the actual date/time is known. For unknown collection date/time use "0000". |
| 18 |  | TS | [1..1] | R |  | Specimen Received Date/Time | **ELR-060:** SPM-18 (Specimen Received Date/Time) SHALL follow the format YYYYMMDD[HH[MM[SS[.S[S[S[S]]]]]]][+/-ZZZZ]. | Time the specimen was received at the diagnostic service. The actual time that is recorded is based on how specimen receipt is managed, and may correspond to the time the sample is logged in. |
| 19 |  |  |  | O |  | Specimen Expiration Date/Time |  |  |
| 20 |  |  |  | O |  | Specimen Availability |  |  |
| 21 |  | CWE\_CRE | [0..\*] | RE | HL70490 | Specimen Reject Reason |  |  |
| 22 |  |  |  | O |  | Specimen Quality |  |  |
| 23 |  |  |  | O |  | Specimen Appropriateness |  |  |
| 24 |  | CWE\_CRE | [0..\*] | RE | HL70493 | Specimen Condition |  |  |
| 25 |  |  |  | O |  | Specimen Current Quantity |  |  |
| 26 |  |  |  | O |  | Number of Specimen Containers |  |  |
| 27 |  |  |  | O |  | Container Type |  |  |
| 28 |  |  |  | O |  | Container Condition |  |  |
| 29 |  |  |  | O |  | Specimen Child Role |  |  |

## NTE – Notes and Comments Segment

The Notes and Comments Segment (NTE) is used to convey additional comments regarding the associated segment. The NTE segment is not intended for automatic processing. The contents of the NTE segment are primarily intended for human use. Automated process should not be based upon the contents of NTE-3 (Comment); rather the content of that field should be displayed to humans.

| Table 4‑16. NTE –Notes And Comments Segment | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Conformance Statement | Description/Comments |
| **1** |  | SI | [1..1] | R |  | Set ID – NTE | **ELR-053:** NTE-1 (Set ID – NTE) SHALL be valued sequentially starting with the value ‘1’ within a given segment group. |  |
| **2** | 1..1 | ID | [0..1] | RE | HL70105 | Source of Comment |  |  |
| **3** |  | FT | [1..\*] | R |  | Comment |  | Comment contained in the segment. |
| **4** |  | CWE\_CRE | [0..1] | RE | HL70364 | Comment Type |  |  |

## FHS – FILE HEADER SEGMENT

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

| Table 4‑17. FHS – File Header Segment | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Description/Comments |
| **1** | 1..1 | ST | [1..1] | R |  | File Field Separator | Character to be used as the field separator for the rest of the message. The supported value is |, ASCII (124). |
| **2** | 4..5 | ST | [1..1] | R |  | File Encoding Characters | Four characters that always appear in the same order in this field: |^~\&|. |
| **3** |  |  |  | O |  | File Sending Application |  |
| **4** |  |  |  | O |  | File Sending Facility |  |
| **5** |  |  |  | O |  | File Receiving Application |  |
| **6** |  |  |  | O |  | File Receiving Facility |  |
| **7** |  |  |  | O |  | File Creation Date/Time |  |
| **8** |  |  |  | X |  | File Security | Not Supported. |
| **9** |  |  |  | O |  | File Name/ID |  |
| **10** |  |  |  | X |  | File Header Comment | Not Supported. |
| **11** |  |  |  | X |  | File Control ID | Not Supported. |
| **12** |  |  |  | X |  | Reference File Control D | Not Supported. |

## FTS – FILE TRAILER SEGMENT

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

| Table 4‑18. FTS – File Trailer Segment | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Description/Comments |
| **1** |  |  |  | O |  | File Batch Count |  |
| **2** | 1..80# | ST | [0..0] | X |  | File Trailer Comment | Not supported. |

## BHS – BATCH HEADER SEGMENT

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

| Table 4‑19. BHS – Batch Header Segment | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Description/Comments |
| **1** | 1..1 | ST | [1..1] | R |  | Batch Field Separator | Character used as the field separator for the rest of the message. The supported value is |, ASCII (124). |
| **2** | 4..5 | ST | [1..1] | R |  | Batch Encoding Characters | Four characters that always appear in the same order in this field: |^~\&|. |
| **3** |  |  |  | O |  | Batch Sending Application |  |
| **4** |  |  |  | O |  | Batch Sending Facility |  |
| **5** |  |  |  | O |  | Batch Receiving Application |  |
| **6** |  |  |  | O |  | Batch Receiving Facility |  |
| **7** |  |  |  | O |  | Batch Creation Date/Time |  |
| **8** |  |  |  | X |  | Batch Security | Not supported. |
| **9** |  |  |  | O |  | Batch Name/ID/Type |  |
| **10** |  |  |  | X |  | Batch Comment | Not supported. |
| **11** |  |  |  | X |  | Batch Control ID | Not supported. |
| **12** |  |  |  | X |  | Reference Batch Control D | Not supported. |

## BTS – Batch TRAILER SEGMENT

The BTS segment defines the end of a batch of messages.

| Table 4‑20. BTS – Batch Trailer Segment | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Seq | Len | DT | Cardinality | Usage | Value Set | HL7 Element Name | Description/Comments |
| 1 | 10 | NM | [1..1] | R |  | Batch Message Count | This is the total number of messages contained in the batch. |
| **2** |  |  |  | X |  | Batch Comment | Not supported. |
| **3** |  |  |  | X |  | Batch Totals | Not supported. |

# Code Systems and Value Sets

Successful message implementation requires that transmitted messages (message instances) contain valid values for coded fields. It is important to note that code sets are relatively dynamic and subject to change between publications of these implementation guides.

Every code value passed in a message instance is drawn from a code system that has a globally unique identifier, such as an OID. In general, the coded values allowed in a field (a) may be drawn from more than one code system, and (b) may be a subset of the codes from a given coding system. Combining (a) and (b) makes it possible for the allowed code value to be a combination of multiple subsets drawn from multiple coding systems. In most cases, only a subset of the codes defined in a code system are legal for use in a particular message.

The subsets of the codes that are legal for a particular field is identified by an HL7 construct known as a "value set." A value set is a collection of coded values drawn from code systems. Value sets serve to identify the specific set of coded values for the message from the universe of coded values across all coding systems.

The segment tables in previous sections identify the value set or coding system used for each supported field containing a coded value. Fields that use the data type CWE require that messages include the code, drawn from *HL7 0396*, that uniquely defines the coding system, as well as the coded value itself. Some of these pre-coordinated value sets must be updated, or new ones created, as new needs are identified.

Value sets are identified by a unique identifier (OID) also, but this identifier is not transmitted in the message. The identifier or code for the coding system from which the value is derived is sent in the message. However, the value set identifier is useful and important when vocabulary items are modified or replaced.

### LOINC

The use of the Logical Observation Identifiers Names and Codes (LOINC) vocabulary is required where a LOINC code is available for the test being resulted. The LOINC terms transmitted by the sender in OBX-3 must be valid but it is not the intent of this guide to specify LOINC values for a given test. It is strongly recommended that the LOINC long common name be sent in addition to the LOINC in order to facilitate debugging and message validation between the sender and the public health agency.

LOINC shall be used as the standard coding system to identify the Resulted Test in the Observation Identifier (OBX-3) if an appropriate LOINC code exists. Appropriate status is defined in the LOINC Manual Section 11.2 Classification of LOINC Term Status. If a local coding system is in use, a local code should also be sent to help with identification of coding issues. <<implementation guidance stub >> When no valid LOINC exists the local code may be the only code sent.

### SNOMED CT

SNOMED CT is a required vocabulary for results reported as Coded With Exception (CWE\_CRO) data types in OBX.5 (and identified as CWE in OBX-2). Each SNOMED CT Concept has a permanent unique **numeric Identifier** which is known as the ConceptId and only these shall be used for this IG[[7]](#footnote-7). In other words, SNOMED alphanumeric legacy codes shall not be used for this IG.

In general, coded results for reportable laboratory results fall into three categories: microorganism names (e.g. 88274000^Tryspanoma curzi^SCT), presence or absence findings ( e.g. 260373001^Detected^SCT), and less commonly substances (255835006^Shiga toxin^SCT). When SNOMED CT is used in OBX-5, CWE\_CRO.9 shall contain the laboratory’s original text which is used for printing and/or display to satisfy CLIA reporting requirements. CWE\_CRO.2 and CWE\_CRO.9 may contain the same value, when the coded description is also the original text.

### Specimen Type

SNOMED CT drawn from the specimen hierarchy in SNOMED CT is the recommended vocabulary for specimen source terms in SPM-4 (Specimen type). Specimen type/source terms in SPM-4 may be drawn from HL7 table 0487 as well. A cross-mapping is under development.<<llink>>

### UCUM

UCUM (Unified Code for Units of Measure) shall be used for reporting units of measure

A table of example UCUM units for electronic messaging is available here: [http://loinc.org/downloads/usage/units](http://loinc.org/downloads/usage/units%20) .

Further information on UCUM can be found at <http://unitsofmeasure.org/>

### Vocabulary Constraints

Table 6‑1. Value Set/Code System shows the various value sets/code systems used in this IG. It also provides information about the source of the vocabulary and an identifier for the vocabulary. The name found in the Value Set/Code System Name column corresponds with the value set identified in the Value Set column of the data type and segment attribute tables found above.

The value sets are cross referenced with the ELR251 Value Sets from the PHIN vocabulary access and distribution system (VADS). This table includes values sets from all data elements including those with “O” Usage and has been reformatted to fit this document – the complete reference table is accessible here:

<https://phinvads.cdc.gov/vads/DownloadHotTopicDetailFile.action?filename=368D12BD-1514-E211-989D-001A4BE7FA90>

PHINVADS provides all ELR related value sets collected into a view that can be accessed here: <http://phinvads.cdc.gov/vads/ViewView.action?name=Electronic%20Laboratory%20Reporting%20(ELR)%20to%20Public%20Health%20-%20HL7%20Version%202.5.1>

| Table 5‑1. Value Set/Code System Summary | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Value Set/Code System Name** | **Code System Source \_(HL7 table 0396 Code)** | **Constrained** | **HL7 Code System OID** | **HL7 Element** | **Data Element Name** | **HL7 Table Type** | **PHIN VADS Value Set Name** | **PHIN VADS Value Set OID** | **Comments** |
| Admission Type Value Set | HL70007 | No | 2.16.840.1.113883.12.7 | PV1-4 | Admission Type | HL7 | PHVS\_AdmissionType\_HL7\_2x | 2.16.840.1.114222.4.11.913 |  |
| Body Site Value Set | SCT | N/A | 2.16.840.1.113883.6.96 | SPM-8 | Specimen Source Site | External | PHVS\_BodySite\_HITSP | 2.16.840.1.113883.3.88.12.3221.8.9 | Specimen Source Site. Identify the body site for injury, specimen, injection and finding. Shall contain a value descending from the SNOMED CT® Anatomical Structure (91723000) hierarchy. |
| Country Value Set | ISO3166\_1 | N/A | 1.0.3166.1 | XAD-6 | Country | External | PHVS\_Country\_ISO\_3166-1 | 2.16.840.1.114222.4.11.828 | This identifies the codes for the representation of names of countries, territories and areas of geographical interest. The complete set of 3166-1 codes. http://www.iso.org/iso/iso-3166-1\_decoding\_table. |
| ELR Reportable Laboratory Observation Identifier Value Set | LN | N/A | 2.16.840.1.113883.6.1 | OBR-4, OBX-3 | Observation  Identifier | External | PHVS\_LabTestName\_ReportableConditions | 2.16.840.1.114222.4.11.6053 | This includes all the LOINC codes from Reportable Condition Mapping Table (RCMT). This set is a smaller subset that includes only the LOINC lab test codes related to reportable conditions. This value set can be further constrained or extended locally by the public health jurisdiciton |
| HL7 V3 Observation Method | OBSMETHOD | Yes | 2.16.840.1.113883.5.84 | OBX-17 | Observation Method | HL7 | PHVS\_LabTestMethods\_CDC | 2.16.840.1.114222.4.11.1003 | \*\*\*\*\*Can we add SNOMED CT Laboratory test sub tree (152200000)? |
| HL70001 | HL70001 | No | 2.16.840.1.113883.12.1 | PID-8 | Administrative Sex | HL7 | PHVS\_AdministrativeSex\_HL7\_2x | 2.16.840.1.114222.4.11.927 |  |
| HL70003 | HL70003 | No | 2.16.840.1.113883.12.3 | MSG-2 | Trigger Event | HL7 | PHVS\_EventType\_HL7\_2x | 2.16.840.1.114222.4.11.3337 | Event type, Constrained to ‘R01’ |
| HL70004 | HL70004 | No | 2.16.840.1.113883.12.4 | PV1-2 | Patient Class | HL7 | PHVS\_PatientClass\_HL7\_2x | 2.16.840.1.114222.4.11.917 |  |
| HL70005 | HL70005 or CDCREC | N/A | 2.16.840.1.113883.6.238 (code system) | PID-10 | Race | External | PHVS\_Race\_HL7\_2x | 2.16.840.1.114222.4.11.6065 | For the Race Value Set, the Name of Coding System can be either “CDCREC” or “HL70005”. |
| HL70008 | HL70008 | No | 2.16.840.1.113883.12.8 | MSA-1 | Acknowledgment Code | HL7 | PHVS\_AcknowledgmentCode\_HL7\_2x | 2.16.840.1.114222.4.11.958 |  |
| HL70038 | HL70038 | No | 2.16.840.1.113883.12.38 | ORC-5 | Order Status | HL7 | PHVS\_OrderStatus\_HL7\_2x | 2.16.840.1.114222.4.11.1025 |  |
| HL70063 | HL70063 | No | 2.16.840.1.113883.12.63 | NK1-3 | Relationship | HL7 | PHVS\_Relationship\_HL7\_2x | 2.16.840.1.114222.4.11.813 |  |
| HL70065 (2.7.1) | HL70065 (2.7.1) | Yes | 2.16.840.1.113883.12.65 \*\*\* need to update this to v 271\*\*\* | OBR-11 | Specimen Action Code | HL7 | PHVS\_SpecimenActionCode\_HL7\_2x \*\*\* need to update this to v 271 | 2.16.840.1.114222.4.11.3340 \*\*\* need to update this to v 271 | Constrained to A, G, L, O .  See Table 6 ? HL7 Table 0065 - Specimen Action Code below for details |
| HL70076 | HL70076 | Yes | 2.16.840.1.113883.12.76 | MSG-1 | Message Code | HL7 | PHVS\_MessageType\_HL7\_2x -\*\*\*update | 2.16.840.1.114222.4.11.3341 | Constrained to ORU, ACK |
| HL70078 (2.7.1) | HL70078 (2.7.1) | yes | 2.16.840.1.113883.12.78 (code system) \*\*NEED TO UPDATE\*\*\* | OBX-8 | Interpretation Codes | HL7 | PHVS\_AbnormalFlag\_HL7\_27\*\*NEED TO UPDATE\*\*\* | 2.16.840.1.114222.4.11.3343\*\*NEED TO UPDATE\*\*\* | Previously known as Abnormal Flag. See Table 6 ? Below for details. |
| HL70085 | HL70085 | No | 2.16.840.1.113883.12.85 | OBX-11 | Observation Result Status | HL7 | PHVS\_ObservationResultStatus\_HL7\_2x | 2.16.840.1.114222.4.11.811 |  |
| HL70103 | HL70103 | No | 2.16.840.1.113883.12.103 | PT-1 | Processing ID | HL7 | PHVS\_ProcessingID\_HL7\_2x | 2.16.840.1.114222.4.11.1028 |  |
| HL70104 | HL70104 | No | 2.16.840.1.113883.12.104 | VID-1 | Version ID | HL7 | PHVS\_VersionID\_HL7\_2x | 2.16.840.1.114222.4.11.3342 | Constrained to ‘2.5.1’ |
| HL70105 | HL70105 | No | 2.16.840.1.113883.12.105 | NTE-2 | Source of Comment | HL7 | PHVS\_SourceOfComment\_HL7\_2x | 2.16.840.1.114222.4.11.3014 |  |
| HL70119 | HL70119 | No | 2.16.840.1.113883.12.119 | ORC-1 | Order Control | HL7 | PHVS\_OrderControlCodes\_HL7\_2x | 2.16.840.1.114222.4.11.923 | constrained to RE |
| HL70123 | HL70123 | yes | 2.16.840.1.113883.12.123 | OBR-25 | Result Status | HL7 | PHVS\_ResultStatus\_HL7\_2x | 2.16.840.1.114222.4.11.815 | See Table 6-n HL7 Table 0123 – Value Type (V2.5.1). |
| HL70125 | HL70125 | yes | 2.16.840.1.113883.12.125 | OBX-2 | Value Type | HL7 | PHVS\_ValueType\_ELR | 2.16.840.1.114222.4.11.6064 | See Table 6-n HL7 Table 0125 – Value Type (V2.5.1). |
| HL70136 | HL70136 | No | 2.16.840.1.113883.12.136 | various | varies | HL7 | PHVS\_YesNo\_HL7\_2x | 2.16.840.1.114222.4.11.819 | Yes/No |
| HL70155 | HL70155 | Yes | 2.16.840.1.113883.12.155 | MSH-15, MSH-16 | Accept Acknowledgment Type | HL7 | PHVS\_AcceptApplicationAcknowledgmentConditions\_HL7 | 2.16.840.1.114222.4.11.3344 |  |
| HL70189 | HL70189 | No | 2.16.840.1.113883.6.238 (code system) | PID-22 | Ethnic Group | HL7 | PHVS\_EthnicGroup\_HL7\_2x | 2.16.840.1.114222.4.11.6066 |  |
| HL70190 | HL70190 | No | 2.16.840.1.113883.12.190 | XAD-7 | Address Type | HL7 | PHVS\_AddressType\_HL7\_2x | 2.16.840.1.114222.4.11.801 |  |
| HL70191 | HL70191 | No | 2.16.840.1.113883.12.191 | ED-2 | Type of Data | HL7 | PHVS\_TypeOfReferencedData\_HL7\_2x | 2.16.840.1.114222.4.11.3345 |  |
| HL70200 | HL70200 | No | 2.16.840.1.113883.12.200 | XCN-10 | Name Type Code | HL7 | PHVS\_NameType\_HL7\_2x | 2.16.840.1.114222.4.11.810 |  |
| HL70201 | HL70201 | No | 2.16.840.1.113883.12.201 | XTN-2 | Telecommunication Use Code | HL7 | PHVS\_TelecommunicationUseCode\_HL7\_2x | 2.16.840.1.114222.4.11.818 |  |
| HL70202 | HL70202 | No | 2.16.840.1.113883.12.202 | XTN-3 | Telecommunication Equipment Type | HL7 | PHVS\_TelecommunicationEquipmentType\_HL7\_2x | 2.16.840.1.114222.4.11.817 |  |
| HL70203 (2.7.1) | HL70203 (2.7.1) | Yes | 2.16.840.1.113883.12.203 \*\* need to change | CX-5, XCN-13, XON-7 | Identifier Type Code | HL7 | PHVS\_IdentifierType\_CDC \*\* need to update | 2.16.840.1.114222.4.11.999 \*\*\* to change | See Table 6-n.Table 6-n HL7 Table 0203 – Identifier Type (V2.7.1) below for details. |
| HL70204 | HL70204 | No | 2.16.840.1.113883.12.204 | XON-2 | Organization Name Type Code | HL7 | PHVS\_TypeOfOrganizationalNameType\_HL7\_2x | 2.16.840.1.114222.4.11.3346 |  |
| HL70291 (2.7.1) | MEDIATYPE | Yes | 2.16.840.1.113883.6.10 \*\*\* need to change | ED-3 | Data Subtype | HL7 | PHVS\_MIME\_MediaSubType\_IANA | 2.16.840.1.114222.4.11.1011 | See Table 6-n HL7 Table 0291 - Subtype Of Referenced Data below. |
| HL70299 | HL70299 | No | 2.16.840.1.113883.12.299 | ED-4 | Encoding | HL7 | PHVS\_Encoding\_HL7\_2x | 2.16.840.1.114222.4.11.986 |  |
| HL70301 (2.7.1) | HL70301 (2.7.1) | Yes | 2.16.840.1.113883.12.301 \*\* need to update | CNN-11,  EI-4, HD-3 | Universal ID Type | HL7 | PHVS\_UniversalIdType\_HL7\_2x \*\* need to update | 2.16.840.1.114222.4.11.1055 \*\* need to update | Constrained to CLIA, ISO, URI. See Table 6-6. HL7 Table 0301 - Universal ID Type below for details. |
| HL70353 | HL70353 | No | 2.16.840.1.113883.9.NNN | CWE-1, CWE-4 | Identifier, Alternate Identifier | HL7 | \*\* need to update | \*\* need to update | The CWE data type allows communication CWE Statuses (“Null Vauesl”) that indicate whether the value is known or not, not applicable, or not available. |
| HL70354 | HL70354 | No | 2.16.840.1.113883.12.354 | MSG-3 | Message Structure | HL7 | PHVS\_MessageStructure\_HL7\_2x | 2.16.840.1.114222.4.11.3349 | Constrained to ORU\_R01,  ACK |
| HL70357 | HL70357 | No | 2.16.840.1.113883.12.357 | ERR-3 | HL7 Error Code | HL7 | PHVS\_MessageErrorConditionCodes\_HL7\_2x | 2.16.840.1.114222.4.11.974 |  |
| HL70360 | HL70360 | No | 2.16.840.1.113883.12.360 | CNN-7 | Degree | HL7 | PHVS\_DegreeLicenseCertificate\_HL7\_2x | 2.16.840.1.114222.4.11.808 |  |
| HL70364 | HL70364 | Yes | 2.16.840.1.113883.12.364 | NTE-4 | Comment Type | HL7 | PHVS\_CommentType\_CDC | 2.16.840.1.114222.4.11.975 |  |
| HL70369 | HL70369 | Yes | 2.16.840.1.113883.12.369 | SPM-11 | Specimen Role | HL7 | PHVS\_SpecimenRole\_CDC | 2.16.840.1.114222.4.11.1046 |  |
| HL70371 | HL70371 | No | 2.16.840.1.113883.12.371 | SPM-6 | Specimen Additives | HL7 | PHVS\_AdditiveOrPreservative\_HL7\_2x | 2.16.840.1.114222.4.11.960 | consider adding the SNOMED CT substance subtree - Riki working on this? |
| HL70396 | HL70396 | No | 2.16.840.1.113883.12.396 | CE-1, CE-3,  CWE-1,  CWE-3 | Name of Coding System | HL7 | PHVS\_CodingSystem\_HL7\_2x\_Table0396 | 2.16.840.1.114222.4.11.3338 | HL7 Table 0396 defines the standard coding systems recognized by HL7. The table defines a mechanism by which locally defined codes can be transmitted. Any code/coding system not defined in HL7 Table 0396 is considered a “local” coding system from the Hl |
| HL70487 (Specimen Type Value Set) | HL7 | No | 2.16.840.1.113883.12.487 | SPM-4 | Specimen Type | HL7 | PHVS\_SpecimenType\_HL7\_2x | 2.16.840.1.114222.4.11.6046 | Specimen Type Union of HL70487 and SNOMED CT Specimen sub-tree (12303009) |
| HL70488 (Specimen Collection Method Value Set) | HL70488 | No | 2.16.840.1.113883.12.488 | SPM-7 | Specimen Collection Method | HL7 | PHVS\_SpecimenCollectionMethod\_HL7\_2x | 2.16.840.1.114222.4.11.1041 | Specimen Collection Method. Union of HL7 Table 0488 and SNOMED CT Specimen Collection (17636008) sub-tree. |
| HL70490 | HL70490 | No | 2.16.840.1.113883.12.490 | SPM-21 | Specimen Reject Reason | HL7 | PHVS\_SpecimenRejectReason\_HL7\_2x | 2.16.840.1.114222.4.11.1044 |  |
| HL70493 | HL70493 | No | 2.16.840.1.113883.12.493 | SPM-24 | Specimen Condition | HL7 | PHVS\_SpecimenCondition\_CDC | 2.16.840.1.114222.4.11.1042 |  |
| HL70507 (2.7.1) | HL70507 (2.7.1) | Yes | 2.16.840.1.113883.12.507 \*\* change | OBR-49 | Result Handling | HL7 | PHVS\_ObservationResultHandling\_HL7\_2x \*\*change | 2.16.840.1.114222.4.11.3357 \* \*change | See table 6-n for details |
| HL70516 | HL70516 | No | 2.16.840.1.113883.12.516 | ERR-4 | Severity | HL7 | PHVS\_ErrorSeverity\_HL7\_2x | 2.16.840.1.114222.4.11.993 |  |
| HL70834 (2.7.1) | MEDIATYPE | Yes | 2.16.840.1.113883.6.10 \*\* change for 2,7,1 | ED-2 | Type of Data | HL7 | PHVS\_MIME\_MediaType\_IANA \*\* change for 2,7,1 | 2.16.840.1.114222.4.11.1012 \*\* change for 2,7,1 | See Table 6-n HL7 Table 0834 – MIME Type below. |
| ELR Reportable Coded Observation Value Set | SCT | N/A | 2.16.840.1.113883.6.96 | OBX-5 | Observation Value | External | PHVS\_LabTestResult\_ReportableConditions | 2.16.840.1.114222.4.11.6054 | This includes all the SNOMED CT concept ID from the Reportable Condition Mapping Table (RCMT). This value set includes only SNOMED CT concept IDs for coded related to reportable conditions. This includes microorganism, substances and ordinal results. This value set can be further constrained or extended locally by the public health jurisdiciton |
| PHVS\_Animal\_CDC | SCT | n/a | 2.16.840.1.113883.6.96 | PID-35 | Species Code | External | PHVS\_Animal\_CDC | 2.16.840.1.114222.4.11.1074 | Animal |
| PHVS\_County\_FIPS\_6-4 | FIPS6\_4 | N/A | 2.16.840.1.113883.6.93 | XAD-9 | County/Parish Code | External | PHVS\_County\_FIPS\_6-4 | 2.16.840.1.114222.4.11.829 | Codes representing county of origin, address county, reporting county |
| PHVS\_ModifierOrQualifier\_CDC | SCT | N/A | 2.16.840.1.113883.6.96 | SPM -5, SPM-9 | Specimen Type Modifier, Specimen Source Site Modifier | External | PHVS\_ModifierOrQualifier\_CDC | 2.16.840.1.114222.4.11.1014 | Used for Specimen Type Modifier and Specimen Source Site Modifier. Based on a subset of SNOMED CT. |
| Postal Code Value Set | USPS | N/A | 2.16.840.1.113883.3.88.12.80.2 | XAD-5 | Zip or Postal Code | External |  |  | Zipcodes need to be downloaded from USPS website. This identifies the postal (ZIP) Code of an address in the United States http://zip4.usps.com/zip4/welcome.jsp |
| SNOMED CT Specimen Collection (17636008) sub-tree | SCT | N/A | 2.16.840.1.113883.6.96 | SPM-7 | Specimen Collection Method | External | PHVS\_SpecimenCollectionMethod\_CDC | 2.16.840.1.114222.4.11.3282 | Specimen Collection Method. Union of HL7 Table 0488 and SNOMED CT Specimen Collection (17636008) sub-tree. |
| SNOMED CT Specimen sub-tree (12303009) | SCT | N/A | 2.16.840.1.113883.6.96 | SPM-4 | Specimen Type | External | PHVS\_Specimen\_CDC | 2.16.840.1.114222.4.11.946 | Specimen Type Union of HL70487 and SNOMED CT Specimen sub-tree (12303009) |
| State Value Set | FIPS5\_2 | N/A | 2.16.840.1.113883.6.92 | XAD-4 | State or Province | External | PHVS\_State\_FIPS\_5-2 | 2.16.840.1.114222.4.11.830 | Identifies addresses within the United States are recorded using the FIPS 5-2 two-letter alphabetic codes for the State, District of Columbia, or an outlying area of the United States or associated area. http://www.itl.nist.gov/fipspubs/fip5-2.htm |
| Reason For Study Value Set | I9CDX | N/A | 2.16.840.1.113883.6.103 | OBR-31 | Reason For Study | External | PHVS\_AdministrativeDiagnosis\_CDC\_ICD-9CM | 2.16.840.1.114222.4.11.856 | Reason for Study. Union of concepts from PHVS\_AdministrativeDiagnosis\_CDC\_ICD-9CM and ICD-10. Note: HITSP apparently has stopped using ICD-9 for diagnosis and focused on using value sets from SNOMED CT. |
| Reason For Study Value Set | SCT | N/A | 2.16.840.1.113883.6.96 | OBR-31 | Reason For Study | External | PHVS\_ProblemList\_HITSP | 2.16.840.1.113883.3.88.12.3221.7.4 | HITSP Problem list includes a broader set of concepts such as diagnosis, diseases, finding, symptoms and signs. |
| Unified Code for Units of Measure (UCUM) | UCUM | N/A | 2.16.840.1.113883.6.8 | CQ-2, OBX-6 | Units | External | PHVS\_UnitsOfMeasure\_CDC | 2.16.840.1.114222.4.11.838 | Units of measure concepts that includes atomic UCUM units as well as UCUM expression. |

### Constrained HL7 Tables

This section provides values for only those HL7 tables that are constrained by this IG. HL7 tables in this guide are as specified in the HL7 Version 2.5.1 Standard, except as noted below.

* HL7 Table 0065-Specimen Action Code is pre-adopted from HL7 Version 2.7.1
* HL7 Table 0078- Interpretation Codes. ( Abnormal Flag) is pre-adopted from HL7 Version 2.7.1
* HL7 Table 0203-Identifier Type is pre-adopted from HL7 Version 2.7.1
* HL7 Table 0291-Subtype of referenced data is pre-adopted from HL7 Version 2.7.1
* HL7 Table 0301-Universal ID Type is pre-adopted from HL7 Version 2.7.1
* HL7 Table 0507-Observation Result Handling is pre-adopted from HL7 Version 2.7.1
* HL7 Table 0834-MIME Types is pre-adopted from HL7 Version 2.7.1

### HL7 Table 0065 – Specimen Action Code (V2.7.1)

| Table 5‑2. HL7 Table 0065 Specimen Action Code (V2.7.1) | | |
| --- | --- | --- |
| Value | Description | Comment |
| A | Add ordered tests to the existing specimen |  |
| G | Generated order; reflex order |  |
| L | Lab to obtain specimen from patient |  |
| O | Specimen obtained by service other than Lab |  |

### HL7 Table 0076 – Message Type (V2.5.1)

| Table 5‑3. HL7 Table 0076 Message Type (v2.5.1) | | |
| --- | --- | --- |
| Value | Description | Comment |
| ORU | Unsolicited transmission of an observation message |  |
| ACK | General acknowledgment message |  |

### HL7 Table 0078 – Interpretation Codes (V2.7.1)

|  | | |
| --- | --- | --- |
| Value | Description | Comment |
| L | Below low normal |  |
| H | Above high normal |  |
| LL | Below lower panic limits |  |
| HH | Above upper panic limits |  |
| < | Below absolute low-off instrument scale |  |
| > | Above absolute high-off instrument scale |  |
| N | Normal (applies to non-numeric results) |  |
| A | Abnormal (applies to non-numeric results) |  |
| AA | Very abnormal (applies to non-numeric units, analogous to panic limits for numeric units) |  |
| null | No range defined, or normal ranges don't apply |  |
| U | Significant change up |  |
| D | Significant change down |  |
| B | Better—use when direction not relevant |  |
| W | Worse—use when direction not relevant |  |
| S | Susceptible. Indicates for microbiology susceptibilities only. |  |
| R | Resistant. Indicates for microbiology susceptibilities only. |  |
| I | Intermediate. Indicates for microbiology susceptibilities only. |  |
| MS | Moderately susceptible. Indicates for microbiology susceptibilities only. |  |
| VS | Very susceptible. Indicates for microbiology susceptibilities only. |  |
| POS | Positive | Added in HL7 Version 2.7 |
| NEG | Negative | Added in HL7 Version 2.7 |
| IND | Indeterminate | Added in HL7 Version 2.7 |
| DET | Detected | Added in HL7 Version 2.7 |
| ND | Not Detected | Added in HL7 Version 2.7 |
| AC | Anti-complementary substances present | Added in HL7 Version 2.7 |
| TOX | Cytotoxic substance present | Added in HL7 Version 2.7 |
| QCF | Quality Control Failure | Added in HL7 Version 2.7 |
| RR | Reactive | Added in HL7 Version 2.7 |
| WR | Weakly reactive | Added in HL7 Version 2.7 |
| NR | Non-reactive | Added in HL7 Version 2.7 |

### HL7 Table 0123 – Results Status (V2.5.1)

| Table 5‑5. HL7 Table 0123 – Result Status (V2.5.1) | | |
| --- | --- | --- |
| Value | Description | Comment |
| A | Some, but not all, results available |  |
| C | Correction to results |  |
| F | Final results; results stored and verified. Can only be changed with a corrected result. |  |
| I | No results available; specimen received, procedure incomplete |  |
| O | Order received; specimen not yet received |  |
| P | Preliminary: A verified early result is available, final results not yet obtained |  |
| R | Results stored; not yet verified |  |
| S | No results available; procedure scheduled, but not done |  |
| X | No results available; Order canceled. |  |

### HL7 TABLE 0125 – VALUE TYPE (V2.5.1)

| Table 5‑6. HL7 Table 0125 – Value Type (V2.5.1) | | | |
| --- | --- | --- | --- |
| Value | Description | Usage | Comment |
| CE | Coded Entry | O |  |
| CWE | Coded with Exceptions | R | This Implementation Guide has a specially constrained version of the CWE data type in section which is used for OBX-5. The version of the CWE documented in section shall not be used for OBX-5. The version of the CWE constrained for use with OBX-5 requires sending coded data. If the lab is trying to send only string data, the ST, TX or FT data types should be used.  Data type to be used where it is important to communicate the coding system and coding system version with the coded result being reported. Pre-adopted from *Version 2.6.* |
| CX | Extended Composite ID With Check Digit | O |  |
| DT | Date | R |  |
| ED | Encapsulated Data | R | Field using the ED data type to allow communication of images, sound clips, XML documents, html markup, etc. |
| FT | Formatted Text (Display) | R | Field using the FT data type to carry a text result value. This is intended for display. The text may contain formatting escape sequences as described in the data types section. Numeric results and numeric results with units of measure should not be reported as text. These should be reported as NM or SN numeric results, with the units of measure in OBX-6. |
| NM | Numeric | R | Field using the NM data type to carry a numeric result value. The only non-numeric characters allowed in this field are a leading plus (+) or minus (-) sign. The structured numeric (SN) data type should be used for conveying inequalities, ranges, ratios, etc. The units for the numeric value should be reported in OBX-6. |
| RP | Reference Pointer | R | Field using the RP data type to allow communication of pointers to images, sound clips, XML documents, html markup, etc. The RP data type is used when the object being pointed to is too large to transmit directly.  This specification defines the mechanism for exchanging pointers to objects, but it does not address the details of applications actually accessing and retrieving the objects over a network.  The most common scheme for passing a pointer is to use a Universal Resource Identifier (URI). See <http://ietf.org/rfc/rfc2396.txt> for detailed definition. The general format of a URI is in the form: <scheme>://<authority><path>?<query>. The scheme and authority portions appear in the Application ID component, Universal ID subcomponent. The path and query portion of the URI appear in the Pointer component of the RP data type. |
| SN | Structured Numeric | R | Field using the SN data type to carry a structured numeric result value. Structured numeric include intervals (^0^-^1), ratios (^1^/^2 or ^1^:^2), inequalities (<^10), or categorical results (2^+). The units for the structured numeric value should be reported in OBX-6. |
| ST | String Data | R | Field using the ST data type to carry a short text result value. Numeric results and numeric results with units of measure should not be reported as text. These shall be reported as NM or SN numeric results, with the units of measure in OBX-6. |
| TM | Time | R |  |
| TS | Time Stamp (Date & Time) | R |  |
| TX | Text Data (Display) | R | Field using the TX data type to carry a text result value this is intended for display. Numeric results and numeric results with units of measure should not be reported as text. These should be reported as NM or SN numeric results, with the units of measure in OBX-6. |

### HL7 Table 0155 – Accept/Application Acknowledgment Conditions (V2.5.1)

| Table 5‑7. HL7 Table 0155 – Accept/Application Acknowledgment Conditions (V2.5.1) | | | |
| --- | --- | --- | --- |
| Value | Description | Usage | Comment |
| AL | Always | O |  |
| NE | Never | R |  |
| ER | Error/reject conditions only | O |  |
| SU | Successful completion only | O |  |

### HL7 Table 0203 – Identifier Type (V2.7.1)

| Table 5‑8 . HL7 Table 0203 – Identifier Type (V2.7.1) | | |
| --- | --- | --- |
| Value | Description | Comment |
| AM | American Express |  |
| AN | Account number |  |
| ANC | Account number Creditor |  |
| AND | Account number debitor |  |
| ANON | Anonymous identifier |  |
| ANT | Temporary Account Number |  |
| APRN | Advanced Practice Registered Nurse number |  |
| BA | Bank Account Number |  |
| BC | Bank Card Number |  |
| BR | Birth registry number |  |
| BRN | Breed Registry Number |  |
| CC | Cost Center number |  |
| CY | County number |  |
| DDS | Dentist license number |  |
| DEA | Drug Enforcement Administration registration number |  |
| DFN | Drug Furnishing or prescriptive authority Number |  |
| DI | Diner\_s Club card |  |
| DL | Driver\_s license number |  |
| DN | Doctor number |  |
| DO | Osteopathic License number |  |
| DPM | Podiatrist license number |  |
| DR | Donor Registration Number |  |
| DS | Discover Card |  |
| EI | Employee number |  |
| EN | Employer number |  |
| FI | Facility ID |  |
| GI | Guarantor internal identifier |  |
| GL | General ledger number |  |
| GN | Guarantor external identifier |  |
| HC | Health Card Number |  |
| IND | Indigenous/Aboriginal |  |
| JHN | Jurisdictional health number (Canada) |  |
| LI | Labor and industries number |  |
| LN | License number |  |
| LR | Local Registry ID |  |
| MA | Patient Medicaid number |  |
| MB | Member Number |  |
| MC | Patient's Medicare number |  |
| MCD | Practitioner Medicaid number |  |
| MCN | Microchip Number |  |
| MCR | Practitioner Medicare number |  |
| MD | Medical License number |  |
| MI | Military ID number |  |
| MR | Medical record number |  |
| MRT | Temporary Medical Record Number |  |
| MS | MasterCard |  |
| NE | National employer identifier |  |
| NH | National Health Plan Identifier |  |
| NI | National unique individual identifier |  |
| NII | National Insurance Organization Identifier |  |
| NIIP | National Insurance Payor Identifier (Payor) |  |
| NNxxx | National Person Identifier where the xxx is the ISO table 3166 3-character (alphabetic) country code |  |
| NP | Nurse practitioner number |  |
| NPI | National provider identifier |  |
| OD | Optometrist license number |  |
| PA | Physician Assistant number |  |
| PCN | Penitentiary/correctional institution Number |  |
| PE | Living Subject Enterprise Number |  |
| PEN | Pension Number |  |
| PI | Patient internal identifier |  |
| PN | Person number |  |
| PNT | Temporary Living Subject Number |  |
| PPN | Passport number |  |
| PRC | Permanent Resident Card Number |  |
| PRN | Provider number |  |
| PT | Patient external identifier |  |
| QA | QA number |  |
| RI | Resource identifier |  |
| RN | Registered Nurse Number |  |
| RPH | Pharmacist license number |  |
| RR | Railroad Retirement number |  |
| RRI | Regional registry ID |  |
| SID | Specimen identifier |  |
| SL | State license |  |
| SN | Subscriber Number |  |
| SR | State registry ID |  |
| SS | Social Security number |  |
| TAX | Tax ID number |  |
| TN | Treaty Number/ (Canada) |  |
| U | Unspecified identifier |  |
| UPIN | Medicare/CMS (formerly HCFA)\_s Universal Physician Identification numbers |  |
| VN | Visit number |  |
| VS | VISA |  |
| WC | WIC identifier |  |
| WCN | Workers\_ Comp Number |  |
| XX | Organization identifier |  |

### HL7 Table 0291 – Subtype Of Referenced Data (V2.7.1)

| Table 5‑9. HL7 Table 0291 - Subtype Of Referenced Data (V2.7.1) | | |
| --- | --- | --- |
| Value | Description | Comment |
|  | Source RFC 2046 | MIME media subtypes established in accordance with RFC 2046 (http://ietf.org/rfc/rfc2046.txt) and registered with the Internet Assigned Numbers Authority (http://www.iana.org/numbers.html). Note that the MIME media subtype values are case-insensitive, in accordance with RFC 2045. |

### HL7 Table 0301 from 2.7- Universal ID Type (V2.7.1)

| Table 5‑10. (V2.7.1) | | | |
| --- | --- | --- | --- |
| Value | Description | Usage | Comments |
| CLIA | Clinical Laboratory Improvement Amendments. Allows for the ability to designate organization identifier as a “CLIA” assigned number (for labs) | R | May be used as the Universal ID Type in the HD data types for MSH.4 |
| ISO | An International Standards Organization Object Identifier | R | Used as the Universal ID Type in the CNN, EI and HD data types. |
| URI | Uniform Resource Identifier | R | Used as the Universal ID Type in the RP data type |

### Hl7 Table 0354 – Message Structure (V2.5.1)

| Table 5‑11. HL7 Table 0354 - Message Structure (V2.5.1) | | | |
| --- | --- | --- | --- |
| Value | Description | Usage | Comments |
| ORU\_R01 | Unsolicited transmission of an observation message | R | Required for Profiles: |
| ACK | General Acknowledgment Message for unsolicited transmission of an observation message | R | Required for Profiles |

### HL7 Table 507 – Observation Result Handling (V2.7.1)

| Table 5‑12. HL7 Table 0507 - Observation Result Handling (V2.7.1) | | |
| --- | --- | --- |
| Value | Description | Comments |
| F | Film-with-patient |  |
| N | Notify provider when ready |  |
| A | Alert provider when abnormal |  |
| CC | Copies Requested |  |
| BCC | Blind Copy |  |

### HL7 Table 0834 – MIME Type (V2.7.1)

| Table 5‑13. HL7 Table 0834 – MIME Type (V2.7.1) | | | |
| --- | --- | --- | --- |
| Value | Description | Usage | Comments |
| application | Application data | O |  |
| audio | Audio data | R |  |
| image | Image data | R |  |
| model | Model data | O |  |
| text | Text data | R |  |
| video | Video data | R |  |
| multipart | MIME multipart package | O |  |

## Vocabulary Distribution

Vocabularies recommended in this guide are primarily standard vocabularies recommended by the HITSP for use in the particular domains. In many cases, these vocabularies are further constrained into value sets for use within this guide or were previously constrained into value sets by the CDC and maintained in PHIN VADs for use in the Public Health domain.

PHIN VADS is based upon Whitehouse E-Gov Consolidated Health Informatics (CHI) domain recommendations and its main purpose is to distribute the vocabulary subsets that are needed for public health. PHIN VADS allow implementers to browse, search, and download the value sets associated with an implementation guide. PHIN VADS has the capability to host multiple versions of value sets and implementation guide vocabulary. PHIN VADS provides vocabulary metadata that are needed for HL7 messaging or CDA implementation. The latest version of any value set referenced in this implementation guide can be obtained from the CDC PHIN VADS [<http://phinvads.cdc.gov>].

# Laboratory Result Message Development Resources

**Examples should not be used as the basis for implementing the messages in the implementation guide.** Examples are handcrafted and as such are subject to human error.

The National Institute of Standards and Technology (NIST) has established a website: <<website>t the HIT developer community. The site has a number of tools and related materials to assist implementers with the development and testing of software in preparation for ONC Certification.

To support the Laboratory Messaging community, a repository has been established to function as a dynamic library of V2.x.x example messages, technical corrections, and other materials with the intent of providing continuous growth of resources without being time bound to future publications of this guide.

The repository is available at [<<LINK>>](http://hl7v2labtesting.nist.gov:8081/) Example Laboratory Result Messages

# Additional Implementation Guidance

## Parent/Child Reporting for Reflex and Culture/Susceptibility Testing

### Parent/Child Linking

This section presents a brief discussion on Parent/Child Linking .

#### High Level Description of Parent/Child Linking

It must be understood that an observation can be the catalyst for additional tests, (reflex tests for example). When looking at those tests, it is important to understand which observation was the originator (Parent), and which observation was generated (Child). Note that there is no information in the Parent that indicates the presence of a Child. It is the function of the Child pointing to a Parent that defines the relationship.

Both parent and child(ren) must be in the same message and the parent must precede its child(ren).

#### Profile Component Considerations

The profiles in this IG indicate that the test can be identified using the placer order number or using the filler order number. No additional information is necessary since either identifier on its own is unique.

#### Detailed Explanation of How Parent/Child Result Linking Works

Order processing of the child is beyond the scope of this document, it is important to note that the Child observations will have its own Common Order(ORC)/Observation Request(OBR) group. The Child’s “Parent Result” field (OBR-26), and “Parent” field (OBR-29) are used to link to the Parent as described below.

##### OBR-26 – Parent Result

OBR-26 is populated in the Child observations, and this provides a link between the Child OBR, and the OBX in the Parent that generated the new tests. It will contain the two subfields, the first (OBR-26.1) will be valued with the Parent’s “Observation Identifier” (OBX-3), and the second (OBX-26.2) will be valued with the Parent’s “Observation Sub-ID” (OBX-4). (Please **Note:** The Parent’s “Observation Identifier” (OBX-3) component separators will need to be converted to sub-component separators when placed into the Child’s OBR.)

Note that OBR-26 Parent Result link works the same across each component profile combination. Also note that OBR-26 alone is insufficient to identify the OBR the parent OBX is associated with. OBR-29 (Parent) is needed to identify the specific parent OBR that the parent OBX is associated with.

**Parent OBX**

|  |
| --- |
| OBX|1|TX|**008847^Urine Culture, Routine^99zzz^630-4^Bacteria identified^LN^^^Bacteria identified**|**1**|L-99990^Gram negative rods^ORM||||||F|20031013163200||20110615100900|… |

**Child OBR**

|  |
| --- |
| OBR|2|15810^H\_Dx\_2\_0|16699480030^MB|997135^Antimicrobial Susceptibility^99zzz|||20110614160000||||G|||||^Family^Fay||15810||||20110615102200|||F|**008847&Urine Culture, Routine&99zzz&630-4&Bacteria identified&LN&&&Bacteria identified^1**|**…** |

##### OBR-29 - Parent

OBR-29 is populated in the Child observations, and this provides a link between the Child OBR, and the Parent OBR- The Child’s OBR-29 shall contain two fields the first (OBR-29.1) will be populated with the Parent’s OBR-2 value, and the second field (OBR-29.2) will be populated with the Parent’s OBR-3 value. (Please **Note:** The Parent’s OBR-2, and OBR-3, component separators will need to be converted to sub-component separators when placed into the Child’s OBR-)

##### OBR-11 -Specimen Action Code

##### OBR-29 is required if OBR-11 (Specimen Action Code) is populated with a “G” indicating the OBR is associated with a generated or reflex order).

**Example:**

**Parent OBR**

|  |
| --- |
| OBR|1|15810^^2.16.840.1.113883.19.3.1.1^ISO|16699480030^^2.16.840.1.113883.19.3.1.2^ISO|008847^Urine Culture, Routine^99zzz|||20110614160000||||||^SRC:CL CATCH|||^Family^Fay||||||20110615102200|||F|… |

**Child OBR**

|  |
| --- |
| OBR|2|15811^^2.16.840.1.113883.19.3.1.1^ISO|16699480031^^2.16.840.1.113883.19.3.1.2^ISO|997135^Antimicrobial Susceptibility^99zzz|||20110614160000||||G|||||^Family^Fay||||||20110615102200|||F|008847&Urine Culture, Routine&99zzz^1|||**15810&&2.16.840.1.113883.19.3.1.1&ISO^16699480030&&2.16.840.1.113883.19.3.1.2&ISO**|… |

Things to **Note:**

* The profiles requires that each OBR be uniquely identified by OBR-2/OBR-3, which means that these identifiers must be different in each OBR segment in the message.
* The examples show OBR-2 populated in both the Parent and Child OBR’s. In many circumstances, the Child OBR-2 will likely be empty as the placer is unlikely to assign a placer order number for the child result. Since all profiles have OBR-2 list as RE (required but may be empty) this is not normally a problem.
* OBR-11 (Specimen Action Code) is valued with G (generated or reflex order) of the second OBR in each example. When OBR-11 is valued G, OBR-29 becomes required.

##### Specimen Inheritance

When reporting child results, the specimen information reported on its parent are not automatically assumed to be inherited by the children. Each child OBR must include the relevant specimen segment(s) for the observations being reported.

### Culture and Susceptibilities Reporting

Section 7.1.1 describes the general use of parent-child result linking which may apply to any sort of reflex testing. This section focuses on parent/child result linking for the purpose of reporting microbiology culture and susceptibilities.

#### Introduction

Culture and sensitivities (e.g., reporting of multi-resistant tuberculosis or drug-resistant gonococcus or pneumococcus) can be reported using the HL7 electronic messaging standard in a number of different ways. Consequently, many vendors and large laboratories use varying methods to account for variations in the systems with which they work while still staying within the standard definitions. To improve consistency when implementing new or upgrading existing laboratory results interfaces, and considering that culture and susceptibilities reporting is a critical component of electronic, laboratory-based public health reporting, this IG requires a specific approach, using parent-child relationship, when reporting microbiology results for this message profile that shall be supported.

Both parent and child(ren) SHALL be in the same message and the parent SHALL precede its child(ren).

#### Template for Culture Results

A template report for the initial identification of three organisms from a single stool culture is presented below. For each field (*i.e.*, the space between the pipes, "|"), a description of what should appear in that particular field is given, along with the segment-field number in parentheses (*e.g.*, OBR-3) for some of the fields. Note that these examples use the ORU^R01 message type.

MSH|…

PID|…

OBR|1| Placer number | Filler number | Identifier code for the requested test or panel of tests(OBR-4) |…

OBX|1|CE| Specific organism identifier (OBX-3) | Sub-id for the **first** organism (OBX-4) | Description of organism (OBX-5) |…

OBX|2|SN| Other identifier (OBX-3) | Sub-id for the **first** organism (OBX-4) | Observation on the organism (OBX-5) |…

OBX|3|CE| Specific organism identifier (OBX-3) | Sub-id for the **second** organism (OBX-4) | Description of organism (OBX-5) |…

OBX|4|SN| Other identifier (OBX-3) | Sub-id for the **second** organism (OBX-4) | Observation on the Organism (OBX-5) |…

OBX|5|CE| Specific organism identifier (OBX-3) | Sub-id for the **third** organism (OBX-4) | Description of organism (OBX-5) |…

OBX|6|SN| Other identifier (OBX-3) | Sub-id for the **third** organism (OBX-4) | Observation on the organism (OBX-5) |…

SPM|1| Specimen identifier for the specimen being tested|\_

This report has the MSH (Message Header), the PID (Patient Identification Segment), a single OBR (Observation Request Segment), and six OBX (Observation/Results) segments, and a single SPM (Specimen Segment). Note that the Set ID in the first field of each OBX is sequential, while the Sub-ID in the fourth field of each OBX is not sequential, but acts as a link for all of the OBX segments that are reporting information for a related observation. The Sub-ID field in the template above has the words "first," "second" and "third" in **bold** and highlighted in green. This is done to show that the identification of the first organism is the relating observation for the first two OBX segments (*e.g.*, Set-ID numbers 1 and 2). The identification of the second organism is the relating observation for the second two segments (*e.g.*, Set-ID numbers 3 and 4), and so on. An example using the template above is presented below.

### Examples of Culture Results

In this example, Reliable Labs, Inc. is sending preliminary results of a stool culture to state public health authorities. Three pathogens have been identified: Campylobacter jejuni, Salmonella and Shigella.

This example shows the use of the Sub-ID in OBX-4 to connect related observations. The Sub-ID is shown in bolded letters and highlighted in green, as presented in the previous template. In this example, numbers are used for the Sub-ID. However, a text identifier such as "isolate1" could be used. The HL7 standard has defined the Sub-ID (*e.g.*, OBX-4) as a "string" data type. Thus, it can be either a number or text.

In this example, the information about colony counts in OBX segments with Set IDs 2, 4, and 6 is provided to show how the Sub-ID is used to relate the associated OBX segments to each other (*e.g.*, 1 and 2, 3 and 4, 5 and 6). Some laboratories may not have this additional information and would therefore transmit only the identification of the organisms (*e.g.*, OBX segments 1, 3 and 5).

Identified organisms must be reported as coded data instead of text data. Coded data enables machine processing of results. String data can normally be interpreted only by humans.

MSH|^~\&|Lab1^1234^CLIA|Reliable^1234^CLIA|ELR^2.16.840.1.113883.19.3.2.3^ISO|SPH^2.16.840.1.113883.19.3.2^ISO|20070701132554-0400||ORU^R01^ORU\_R01|20070701132554000008|P^T|2.5.1|||NE|NE|USA||||PHLABREPORT-NOACK^^2.16.840.1.113883.19.9.7^ISO

SFT|Level Seven Healthcare Software, Inc.^L^^^^&2.16.840.1.113883.19.4.6^ISO^XX^^^1234|1.2|An Lab System|56734||20080817

PID|1||36363636^^^MPI&2.16.840.1.113883.19.3.2.1&ISO^MR^A&2.16.840.1.113883.19.3.2.1&ISO~444333333^^^&2.16.840.1.113883.4.1^ISO^SS||Everyman^Adam^A^^^^L^^^^^^^BS|Mum^Martha^M^^^^M|19750602|M||2106-3^White^CDCREC^^^^04/24/2007|2222 Home Street^^Ann Arbor^MI^99999^USA^H||^PRN^PH^^1^555^5552004|^WPN^PH^^1^955^5551009|eng^English^ISO6392^^^^3/29/2007|M^Married^HL70002^^^^2.5.1||||||N^Not Hispanic or Latino^HL70189^^^^2.5.1||||||||N|||200808151000-0700|Reliable^2.16.840.1.113883.19.3.1^ISO

ORC|RE|23456^EHR^2.16.840.1.113883.19.3.2.3^ISO|9700123^Lab^2.16.840.1.113883.19.3.1.6^ISO|||||||||1234^Admit^Alan^A^III^Dr^^^&2.16.840.1.113883.19.4.6&ISO^L^^^EI^&2.16.840.1.113883.19.4.6&ISO^^^^^^^^MD||^WPN^PH^^1^555^5551005|||||||Level Seven Healthcare, Inc.^L^^^^&2.16.840.1.113883.19.4.6&ISO^XX^^^1234|1005 Healthcare Drive^^Ann Arbor^MI^99999^USA^B|^WPN^PH^^1^555^5553001|4444 Healthcare Drive^Suite 123^Ann Arbor^MI^99999^USA^B

OBR|1|23456^EHR^2.16.840.1.113883.19.3.2.3^ISO|9700123^Lab^2.16.840.1.113883.19.3.1.6^ISO|625-4^Bacteria identified^LN^3456543^ CULTURE, STOOL^99USI^2.26|||200808151030-0700||||||diarrhea|||1234^Admit^Alan^A^III^Dr^^^&2.16.840.1.113883.19.4.6&ISO^L^^^EI^&2.16.840.1.113883.19.4.6&ISO^^^^^^^^MD|^WPN^PH^^1^555^5551005|||||2008081830-0700|||P||||||787.91^DIARRHEA^I9CDX^^^^07/09/2008|1235&Slide&Stan&S&&Dr&MD&&DOC&2.16.840.1.113883.19.4.6&ISO

OBX|1|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.26|**1**|66543000^Campylobacter jejuni^SCT^^^^January 2007||||||P|||200808151030-0700|||0086^Bacterial identification^OBSMETHOD^^^^501-20080815||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|2|SN|564-5^COLONY COUNT:NUM:PT:XXX:QN:VC^LN^^^^2.26|**1**|^10000^-^90000|1^^UCUM^^^^1.6|||||P|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|3|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.26|**2**|302620005^Salmonella group B phase 1 a-e^SCT^^^^January 2007||||||P|||200808151030-0700|||0086^Bacterial identification^OBSMETHOD^^^^501-20080815||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|4|SN|564-5^COLONY COUNT:NUM:PT:XXX:QN:VC^LN^^^^2.26|**2**|>^100000|1^^UCUM^^^^1.6|||||P|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|5|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.26|**3**|77352002^Shigella^SCT^^^^January 2007||||||P|||200808151030-0700|||0086^Bacterial identification^OBSMETHOD^^^^501-20080815||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|6|SN|564-5^COLONY COUNT:NUM:PT:XXX:QN:VC^LN^^^^2.26|**3**|<^1000|1^^UCUM^^^^1.6|||||P|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

SPM|1|23456&EHR&2.16.840.1.113883.19.3.2.3&ISO^9700122&Lab&2.16.840.1.113883.19.3.1.6&ISO||119339001^Stool specimen^SCT^^^^20080131|||||||P^Patient^HL60369^^^^2.5.1|10^g&gram&UCUM&&&&1.6|||||200808151030-0700|200808151100-0700

## Template for Culture and Susceptibility Results

The template and example in the section of this appendix describe a report for a culture. The following template shows how antimicrobial susceptibility results are reported for the culture described in that section. The connection of the culture to the susceptibilities is a "parent-child" relationship, where the culture is the parent result and the susceptibilities are the child results. This means that there can be many child results for a single parent result. In other words, there can be multiple OBR child segments for the single OBR parent segment presented in the section of this appendix. The template for the report containing the culture and susceptibilities appears below. The titles in *Italics* are given to highlight the individual parent and child segments and are not found in an actual HL7 message transmission. It is important to note that in each of the OBR child segments there is a pointer back to the parent result. This pointer is found in OBR-26 (Parent Result) and in OBR-29 (Parent Number).

***Message Header and Patient Identification Segment for the Parent-Child Message***

MSH|…

PID|…

***Parent OBR Segment***

OBR|1| Placer number (OBR-2) | Filler order number (OBR-3) | Identifier code for the requested test or panel of tests (OBR-4) |…

***Parent OBX Segments for First Organism Identified***

OBX|1|CE| Specific organism identifier (OBX-3) | Sub-id for the **first** organism (OBX-4) | Description of organism (OBX-5) |…

OBX|2|SN| Other identifier (OBX-3) | Sub-id for the **first** organism (OBX-4) | Observation on the organism (OBX-5) |…

***Parent OBX Segments for Second Organism Identified***

OBX|3|CE| Specific organism identifier (OBX-3) | Sub-id for the **second** organism (OBX-4) | Description of organism (OBX-5) |…

OBX|4|SN| Other identifier (OBX-3) | Sub-id for the **second** organism (OBX-4) | Observation on the Organism (OBX-5) |…

***Parent OBX Segments for Third Organism Identified***

OBX|5|CE| Specific organism identifier (OBX-3) | Sub-id for the **third** organism (OBX-4) | Description of organism (OBX-5) |…

OBX|6|SN| Other identifier (OBX-3) | Sub-id for the **third** organism (OBX-4) | Observation on the organism (OBX-5) |…

***Child OBR for First Organism identified***

OBR|2| Placer number (OBR-2)| Filler order number (OBR-3) | Identifier code for the requested test or panel of tests (OBR-4) |||||||||||||||||||||| A **pointer** back to the parent OBX segment that contained the identification of the **first** organism, see below for description of "Pointers" (OBR-26) ||| Parent Filler order number (OBR-29) |...

***Child OBX Segments for Susceptibilities of First Organism Identified***

OBX|1|CE|Specific susceptibility identifier for first antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

OBX|2|CE|Specific susceptibility identifier for second antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

OBX|3|CE|Specific susceptibility identifier for third antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

***Child OBR Segment for Susceptibilities of Second Organism Identified***

OBR|3| Placer number (OBR-2)| Filler order number (OBR-3) | Identifier code for the requested test or panel of tests (OBR-4) |||||||||||||||||||||| A **pointer** back to the parent OBX segment that contained the identification of the **second** organism, see below for description of "Pointers" (OBR-26) ||| Parent Filler order number (OBR-29) |...

***Child OBX Segments for Susceptibilities of Second Organism Identified***

OBX|1|CE|Specific susceptibility identifier for first antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

OBX|2|CE|Specific susceptibility identifier for second antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

OBX|3|CE|Specific susceptibility identifier for third antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

***Child OBR Segment for Susceptibilities of Third Organism Identified***

OBR|3| Placer number (OBR-2)| Filler order number (OBR-3) | Identifier code for the requested test or panel of tests (OBR-4) |||||||||||||||||||||| A **pointer** back to the parent OBX segment that contained the identification of the **third** organism, see below for description of "Pointers" (OBR-26) ||| Parent Filler order number (OBR-29) |...

***Child OBX Segments for Susceptibilities of Third Organism Identified***

OBX|1|CE|Specific susceptibility identifier for first antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

OBX|2|CE|Specific susceptibility identifier for second antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

OBX|3|CE|Specific susceptibility identifier for third antimicrobial (OBX-3) || Susceptibility finding (OBX-5) ||| Susceptibility interpretation (OBX-8) |…

***SPM Segment***

SPM|1| Specimen identifier for the specimen being tested|…

### Examples of Culture and Susceptibility Results

Using the template above, this example shows a report of three pathogens identified from a stool specimen with their respective antimicrobial susceptibility tests.

MSH|^~\&| Lab1^1234^CLIA|Reliable^1234^CLIA|ELR^2.16.840.1.113883.19.3.2.3^ISO|SPH^2.16.840.1.113883.19.3.2^ISO|20070701132554-0400||ORU^R01^ORU\_R01|20070701132554000008|P^T|2.5.1|||NE|NE|USA||||PHLABREPORT-NOACK^^2.16.840.1.113883.19.9.7^ISO

SFT|Level Seven Healthcare Software, Inc.^L^^^^&2.16.840.1.113883.19.4.6^ISO^XX^^^1234|1.2|An Lab System|56734||20080817

PID|1||36363636^^^MPI&2.16.840.1.113883.19.3.2.1&ISO^MR^A&2.16.840.1.113883.19.3.2.1&ISO~444333333^^^&2.16.840.1.113883.4.1^ISO^SS||Everyman^Adam^A^^^^L^^^^^^^BS|Mum^Martha^M^^^^M|19750602|M||2106-3^White^CDCREC^^^^04/24/2007|2222 Home Street^^Ann Arbor^MI^99999^USA^H||^PRN^PH^^1^555^5552004|^WPN^PH^^1^955^5551009|eng^English^ISO6392^^^^3/29/2007|M^Married^HL70002^^^^2.5.1||||||N^Not Hispanic or Latino^HL70189^^^^2.5.1||||||||N|||200808151000-0700|Reliable^2.16.840.1.113883.19.3.1^ISO

ORC|RE|23456^EHR^2.16.840.1.113883.19.3.2.3^ISO|9700123^Lab^2.16.840.1.113883.19.3.1.6^ISO|||||||||1234^Admit^Alan^A^III^Dr^^^&2.16.840.1.113883.19.4.6&ISO^L^^^EI^&2.16.840.1.113883.19.4.6&ISO^^^^^^^^MD||^WPN^PH^^1^555^5551005|||||||Level Seven Healthcare, Inc.^L^^^^&2.16.840.1.113883.19.4.6^ISO^XX^^^1234|1005 Healthcare Drive^^Ann Arbor^MI^99999^USA^B|^WPN^PH^^1^555^5553001|4444 Healthcare Drive^Suite 123^Ann Arbor^MI^99999^USA^B

OBR|1|23456^EHR^2.16.840.1.113883.19.3.2.3^ISO|9700123^Lab^2.16.840.1.113883.19.3.1.6^ISO|625-4^Bacteria identified^LN^3456543^ CULTURE, STOOL^99USI^2.26|||200808151030-0700||||||diarrhea|||1234^Admit^Alan^A^III^Dr^^^&2.16.840.1.113883.19.4.6&ISO^L^^^EI^&2.16.840.1.113883.19.4.6&ISO^^^^^^^^MD|^WPN^PH^^1^555^5551005|||||2008081830-0700|||F||||||787.91^DIARRHEA^I9CDX^^^^07/09/2008|1235&Slide&Stan&S&&Dr&MD&&DOC&2.16.840.1.113883.19.4.6&ISO

OBX|1|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.26|**1**|66543000^Campylobacter jejuni^SCT^^^^January 2007||||||F|||200808151030-0700|||0086^Bacterial identification^OBSMETHOD^^^^501-20080815||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|2|SN|564-5^COLONY COUNT:NUM:PT:XXX:QN:VC^LN^^^^2.26|**1**|^10000^-^90000|1^^UCUM^^^^1.6|||||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|3|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.26|**2**|302620005^Salmonella group B phase 1 a-e^SCT^^^^January 2007||||||F|||200808151030-0700|||0086^Bacterial identification^OBSMETHOD^^^^501-20080815||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|4|SN|564-5^COLONY COUNT:NUM:PT:XXX:QN:VC^LN^^^^2.26|**2**|>^100000|1^^UCUM^^^^1.6|||||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|5|CWE|625-4^Bacteria identified:Prid:Pt:Stool:Nom:Culture^LN^^^^2.26|**3**|77352002^Shigella^SCT^^^^January 2007||||||F|||200808151030-0700|||0086^Bacterial identification^OBSMETHOD^^^^501-20080815||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|6|SN|564-5^COLONY COUNT:NUM:PT:XXX:QN:VC^LN^^^^2.26|**3**|<^1000|1^^UCUM^^^^1.6|||||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

SPM|1|23456&EHR&2.16.840.1.113883.19.3.2.3&ISO^9700122&Lab&2.16.840.1.113883.19.3.1.6&ISO||119339001^Stool specimen^SCT^^^^20080131|||||||P^Patient^HL60369^^^^2.5.1|10^g&gram&UCUM&&&&1.6|||||200808151030-0700|200808151100-0700

OBR|2||9700124^Lab^2.16.840.1.113883.19.3.1.6^ISO|50545-3^Bacterial susceptibility panel:-:Pt:Isolate:OrdQn:MIC^LN^^^^2.26|||200808151030-0700|||||||||1234^Admit^Alan^A^III^Dr^^^&2.16.840.1.113883.19.4.6&ISO^L^^^EI^&2.16.840.1.113883.19.4.6&ISO^^^^^^^^MD|^WPN^PH^^1^555^5551005|||||2008081830-0700|||F|**625-4&Bacteria identified:Prid:Pt:Stool:Nom:Culture&LN^1^Campylobacter jejuni**|||**23456&EHR&2.16.840.1.113883.19.3.2.3&ISO^9700123&Lab&2.16.840.1.113883.19.3.1.6&ISO**||787.91^DIARRHEA^I9CDX^^^^07/09/2008|1235&Slide&Stan&S&&Dr&MD&&DOC&2.16.840.1.113883.19.4.6&ISO

OBX|1|SN|6979-9^AMPICILLIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|<^0.06|ug/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|2|SN|7016-9^GENTAMICIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|^0.05|ug/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|3|SN|7002-9^CIPROFLOXACIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|^0.05|ug/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBR|3||9700125^Lab^2.16.840.1.113883.19.3.1.6^ISO|50545-3^Bacterial susceptibility panel:-:Pt:Isolate:OrdQn:MIC^LN^^^^2.26|||200808151030-0700|||||||||1234^Admit^Alan^A^III^Dr^^^&2.16.840.1.113883.19.4.6&ISO^L^^^EI^&2.16.840.1.113883.19.4.6&ISO^^^^^^^^MD|^WPN^PH^^1^555^5551005|||||2008081830-0700|||F|**625-4&Bacteria identified:Prid:Pt:Stool:Nom:Culture&LN^2^Salmonella group B phase 1 a-e**|||**23456&EHR&2.16.840.1.113883.19.3.2.3&ISO^9700123&Lab&2.16.840.1.113883.19.3.1.6&ISO**||787.91^DIARRHEA^I9CDX^^^^07/09/2008|1235&Slide&Stan&S&&Dr&MD&&DOC&2.16.840.1.113883.19.4.6&ISO

OBX|1|SN|6979-9^AMPICILLIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|<^0.06|ug/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|2|SN|7016-9^GENTAMICIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|^0.05|ug/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|3|SN|7002-9^CIPROFLOXACIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|^0.05|ug/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBR|4||9700126^Lab^2.16.840.1.113883.19.3.1.6^ISO|50545-3^Bacterial susceptibility panel:-:Pt:Isolate:OrdQn:MIC^LN^^^^2.26|||200808151030-0700|||||||||1234^Admit^Alan^A^III^Dr^^^&2.16.840.1.113883.19.4.6&ISO^L^^^EI^&2.16.840.1.113883.19.4.6&ISO^^^^^^^^MD|^WPN^PH^^1^555^5551005|||||2008081830-0700|||F|**625-4&Bacteria identified:Prid:Pt:Stool:Nom:Culture&LN^2^Shigella**|||**23456&EHR&2.16.840.1.113883.19.3.2.3&ISO^9700123&Lab&2.16.840.1.113883.19.3.1.6&ISO**||787.91^DIARRHEA^I9CDX^^^^07/09/2008|1235&Slide&Stan&S&&Dr&MD&&DOC&2.16.840.1.113883.19.4.6&ISO

OBX|1|SN|6979-9^AMPICILLIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|<^0.06|µg/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|2|SN|7016-9^GENTAMICIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|^0.05|µg/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

OBX|3|SN|7002-9^CIPROFLOXACIN:SUSC:PT:ISLT:ORDQN:GRADIENT STRIP^LN^^^^2.26|1|^0.05|µg/mL^^UCUM^^^^1.6||S^Susceptible. Indicates for microbiology susceptibilities only^2.16.840.1.113883.12.78|||F|||200808151030-0700|||||200808161030-0700||||Reliable Labs, Inc^L^^^^CLIA&2.16.840.1.113883.19.4.6&ISO^XX^^^1236|3434 Industrial Loop^^Ann Arbor^MI^99999^USA^B|9876543^Slide^Stan^S^^^^^NPPES&2.16.840.1.113883.19.4.6&ISO^L^^^NPI

### Linking Parent and Child Results

The previous example uses the information in OBR-26 as a pointer to the parent OBX where the culture result is reported. OBR-26 has three components. The three components of OBR-26 are the OBX-3, OBX-4 and part of the OBX-5 from the parent OBX segment. The pointer to the parent requires only the first two components. The third component is intended to provide additional information that may be useful, but not necessary. This allows a lengthy result in the parent OBX-5 (*e.g.*, a paragraph describing pathology results) to be truncated or not sent at all.

## Confirmatory and Reflex Testing

**Definition:** Additional laboratory testing included in the original test request by reference to specific follow-up testing, e.g. “Urinalysis w/Culture Reflex” as opposed to “Urinalysis” ordered as a standalone test.  The decision to perform the reflex or confirmatory test is based upon the results of the initial test and application of a predetermined local or national practice guideline, approved protocol or legal requirement.

* **Example:** A Urinalysis with elevated WBCs signals the potential for bacterial infection and a confirmatory Urine Culture is ordered as a reflex test on the same specimen.  Depending on the laboratory standard operating procedure, LIS and nature of the reflexed or confirmatory test, one or more of the following may be generated: a new accession number, new test codes and additional charges.
* **CLIA Compliance:** The initial test request received in the laboratory is adequate to demonstrate an order for both the initial and the additional testing for CLIA compliance and CMS auditing purposes.
  + **LIS Process:** The LIS shall report the reflexed test as one of the following:
    1. one or more additional OBXs as part of an existing OBR or
    2. one or more additional OBR/OBX(s) or
    3. a new accession.

In the event method two or three is used (one or more additional OBR/OBX(s), or a new accession), then the new OBR(s) shall be referenced to the original OBR using the parent-child relationship via the unique identifier in OBR-2 or using OBR-2/OBR-4 if OBR-2 is not unique. In addition, OBR-7 (date specimen was collected or obtained) in the new OBR shall be the same as OBR-7 in the original OBR.

* + **EHR Process:** The EHR should support all three methods of reporting a reflexed test (see above) and associate it with the original test request for the specimen

## Add-On Testing

**Definition:** Additional laboratory testing is requested by an authorized provider (as defined by CLIA and state law) on an existing specimen after the original test request has been submitted to the laboratory.  The decision to request additional testing is individual provider driven and based on any number of factors not limited to a test result.

* **Example:** A physician orders a Complete Blood Count and Basic Metabolic Panel on an outpatient who presented in the office with symptoms of fatigue and a low-grade fever following a camping trip to Wisconsin.  After consultation with an infectious disease physician later in the day, he calls the laboratory and requests the addition of a Lyme’s Disease Antibody test to the specimens already in the laboratory.
* **CLIA Compliance:** CLIA requires the laboratory to obtain a written or electronic test request for the add-on testing from the authorized provider for its records. If the test request is verbal the laboratory must document its efforts to receive a written or electronic test request within 30 days. [42CFR493.1241(b)]
* **LIS Process:** The LIS shall report the add-on test as one of the following:
  + one or more additional OBR/OBX(s) or
  + a new accession.

The new OBR(s) shall be referenced to the original OBR using the parent-child relationship via the unique identifier in OBR-2 or using OBR-2/OBR-4 if OBR-2 is not unique. In addition, OBR-7 (date specimen was collected or obtained) in the new OBR shall be the same as OBR-7 in the original OBR.

* **EHR Process:** The EHR should support both methods of reporting an add-on test (see above) and associate it with the original test request for the specimen

## Paired titers

Because this IG the message is constrained to a single specimen for each Order\_Observation group, reporting paired titers poses unique challenge. Typically a laboratory may receive both the acute and convalescent sample with the order. In other cases, the Order placer may send the convalescent sample after the acute sample. It is outside the scope of this guide to discuss how the samples are accessioned and identified, however it is assumed that both the acute and convalescent sample will be identified separately and their collection dates known.

The following message structure and conventions are recommended for reporting paired titers

<<recommended sctrucure>>

## Reference test results

Additionally, the Sender may need to report laboratory reportable results that did not originate from their facility to their public health jurisdiction. The criterion for reporting results that did not originate with the sender is beyond the scope of this IG, and needs to be negotiated between the Sender and their loca public health jurisdiction. It is assumed that the Sending facility is identified in MSH.3 and MSH.4 and the facility identified in OBX.23, OBX.24 and OBX.25 is the originator of the reportable lab results. Therefore, the reference or send out laboratory should be identified in OBX.23, OBX,24 and OBX.25 for the results that originate from there facility. Furthermore, it is strongly recommended a CLIA number identify the performing facility in OBX.23.

An example of this is shown below

**For Example:**

MSH|||...

...

ORC|||...

OBR|1|||NNNN\_N^my locally LOINC test^....

OBX|1|||NNNN-N^my locally LOINC test^...||414976005^Organism unidentified, referred to CDC (finding)

...

OBR|2|||NNNN-N^Reference lab test panel^LN^....

OBX|1||||NNNN\_-N^Reference lab test results^LN...||Referred test results here|....|CDC lab division here in OBX23|CDC Lab address here|CDC Division Lab Director here

...

There are many occasions when tests results are performed at a outside lab such as a reference lab or as a “sendout” test. The Sender may want to report to the jurisdiction the fact that they are sending a sample for further testing to a reference lab. There are the following SNOMED result codes:

414976005^Organism unidentified, referred to CDC (finding)

414977001^Organism unidentified, referred to reference laboratory for identification (finding)

Example:

OBX|1|ST|20951-0^Salmonella sp serotype [Identifier] in Isolate by Agglutination^LN...|| 41497600^Organism unidentified, referred to CDC (finding) ^SCT …|||...

NTE|1|L|Sending to CDC for further Characterization…

Concept codes for “Referred to reference laboratory” and “Referred to CDC” submitted to SNOMED and are pending.

Example:

OBX||Influenza test|1|inconclusive

OBX||Influenza test|2|<new SNOMED>^**Referred to reference laboratory…**

In these cases, it is recommended ,an NTE segment follow the OBX which comments on the referral. This IG shall be silent on whether the results should be partial until the referred results came back.

## When no standard coding exists for CWE datatypes

**CWE\_RE**

If you have a local code but no valid standard code exists then populate the first triplet with the local code.

Example:

SPM|1||||NW^Nasal Wash^L**|…**

**In some instances the sender may have an uncoded (text only ) element or a free text entry. If** neither a valid standard nor a local code exists then **populate CWE\_RE.9 ,Original text, with the data**

Example:

SPM|1||||^^^^^^^^Nasal Wash**|…**

**CWE\_R for coded results in OBR.4 and OBX.3**

If you have a local code but no valid LOINC exist then populate the first triplet with the local code.

Example:

OBR|1|||**1234^Syphilis Panel^L**|||…

**In some instances the sender may have an uncoded (text only ) element or a free text entry. If** you have neither a standard nor a local code then **use the CWE Status value NAV(Not available ) and populate the CWE\_R.2 Text field with the text entry.**

Example:

OBR|1|||NAV^**Syphilis Panel^**HL70353|||…

**CWE\_RO For coded results in OBX.5:**

OBX.5 CWE data type requires the first and third element be populated (CWE.1 = R, CWE =R) and the original text is RE- Required, empty, so should use either option below for this data element. The choice of which method will work requires negotiation between the Sender and the local public health jurisdiction.

**Method 1:**

Use parent SNOMED code, i.e. move up the vocabulary hierarchy tree to the next level to code (e.g. Serovar to Subspecies) and populate original text OBX.5.9 for results– assume same thing as print out on report. However Local code and original text should represent current level of knowledge.

Example:

OBX|1|CWE|20951-0^Salmonella sp serotype [Identifier] in Isolate by Agglutination^…||**398508004^Salmonella enterica subsp. Enterica^SCT**^167^**Salmonella subspecies I:Rough:i:1,2^L**^07/31/2011^1.2**^Salmonella subspecies I:Rough:i:1,2**||…

**Method 2:**

Use only local code and wait for Standard code ANDYou should always populate original text OBX.5.9 for results– assume same thing as print out on report.

Example:

OBX|1|CWE|20951-0^Salmonella sp serotype [Identifier] in Isolate by Agglutination^…||167^**Salmonella subspecies I:Rough:i:1,2**^L^167^**Salmonella subspecies I:Rough:i:1,2^L**^1.2^1.2**^Salmonella subspecies I:Rough:i:1,2**||…

#### **Options when reporting text only results in OBX.5**

If neither a valid standard nor local code exists then:

OPTION 1) change the “Value type” in OBX.2 to ST (String) or TX (Text) and populate the field with a text only entry.

Example:

OBX|1|**ST**|20951-0^Salmonella sp serotype [Identifier] in Isolate by Agglutination^…||**Salmonella subspecies I:Rough:i:1,2**||…

OPTION 2) Use high level SNOMED concept code, “441742003^Evaluation finding (finding)” as a default value for “Code Unavailable” CWE, and populate CWE.9 with the text only data. This may be useful for error trapping if lacking a standard code from sender.

Example:

OBX|1|CWE|20951-0^Salmonella sp serotype [Identifier] in Isolate by Agglutination^…||441742003^Evaluation finding (finding)^SCT^^^^^^**Salmonella subspecies I:Rough:i:1,2**

## How to create an implementable profile from this Constrainable profile

The purpose of this section it to provide guidance to public health agency in developing a conformant implementable profile that meets the needs for their jurisdiction. It is important to realize the Sender may message ELR messages to multiple jurisdictions , therefore, in order to maintain this interoperability, the fully implementable profile created by one jurisdiction places must still preserve the underlying base profile conformance. If the underlying conformance is not taken into consideration then the same message may cause an error if sent to a neighboring jurisdictions. Please refer to the v 2.8 CH C.B ballot document for a full discussion of conformance , constrainable profiles and implementable profiles

Ground rules for creating a fully implementable profile and maintaining interoperability across jurisdictions:

The behavior of the Receiving applications must IGNORE all elements it does not expect including those elements with Usage X and O.

* Redefining Usage for elements: Listed below are the allowable constraints for usage types to maintain conformance with this IG:

R 🡪 R

RE🡪 R, RE

C(R//b) 🡪 R, C(R/b) ( b follow same rules)

C(RE//b) 🡪 R,RE, C(R/b), C(RE,/b) ( b follow same rules)

O 🡪 R, RE, C(A/B), X

X🡪X

* Cardinality: Usage Rules above outlines the cardinalities allowed for various usage constraints. Refer to the cardinality table from the V2.7.1 Section 2.B.7.4 base standard. Additionally, for the purposes of creating an implementable profile from this guide, consider the cardinalities as the minimum allowed. If the receiver is expecting fewer repetitions of an element that the bound set by the implementable profile, the burden is on the receiver to determine which repetitions it is interested in receiving.
* Length: For the purposes of creating an implementable profile from this guide, the upper limit of allowed length published above will be considered the conformance length. Truncation characters ( #,=) can be assigned a to all lengths not already defined.
* Datatypes: the datatypes cannot be changed. Note that CWE is backwards compatible to both the CE and IS datatypes and even the ST datatype.
* Vocabulary: The vocabulary can be further constrained and still maintain broad interoperability. If on the other hande, a jurisdiction may needs to locally extend the vocabulary to meet their requirements, the local vocabulary may not be compatible with neighboring jurisdictions and the sender should be made aware of this.

See section 1.12.1.2.for a discussion of the PHLabReport-XO –component profile for creating a fully implementable profile in accordance with Chapter 2B.

## Epidemiological important information from ask on Order Entry responses

There are several common core data elements that have been identified as important data elements[[8]](#footnote-8) for Public Health laboratory reporting that do not have a supported field in the ELR252 message. This data may be available to the sending laboratory as a result of Ask at Order Entry (AOE) responses to the laboratory that provides critical information for the calculation or interpretation of some lab results or to satisfy state and federal health agency mandated information gathering requirements, e.g., for blood lead testing. Not every order will have the need for AOE questions and associated observations. Examples of the type of information gathered from a patient include employment information, pregnancy status, the date of the last menstrual period, mother’s age, and questions about family and personal history.

AOE responses can take several formats, including but not limited to:

• Yes/No (and coded) to answer questions like “Is this your first pregnancy?”

• A code drawn from a value set to provide a coded response to “What ethnicity do you consider

yourself part of?”

• A number with units for the mother’s age

• A date format for the patient’s last menstrual period.

There are several potential approaches to including this information when available, but for this IG, they are messaged as an observation in an OBX segment The observations (OBX) segment may follow an Order (OBR) or the Specimen segment (SPM).

The table below lists several of these data element and how to report them as an observation as well as the context in which the element would be expressed in the message. Please note adoption of this value set is voluntary and based upon the individual public health jurisdiction’s requirements.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table N-NN. Epidemiologically Important Questions** | | | | | |
| **Context** | **OBX.2** | **OBX.3** | **OBX.5** | **OBX.6** | **Comments** |
|  | **Observation Type** | **Observation Identifier: LOINC** | **Observation Value Set** | **Units** |  |
| OBR-4 for Order\_Observation group for Epidemiologically important information for public health reporting panel. | NA | 68991-9^Epidemiologically important information for public health reporting panel^LN | NA | NA | This is provided an an option to message Epidemiologically Important Questions as a unique Order\_Observation Group. Note: The Filler Order number (OBR.3) must be unique in the message. |
| The age of patient at time of specimen collection. | SN,NM | 35659-2^Age at specimen collection^LN or 21612-7^Reported Patient Age^LN | Numeric | UCUM Units, for example:  a^years^UCUM d^days^UCUM h^hours^UCUM | ELR-027: If PID-7 (Date/Time of Birth) is not valued, then an OBX segment associated with the SPM segment SHALL be present to report patient age at specimen collection |
| Date when sign and symptoms of condition first appeared. | TS\_3 | 11368-8^Illness or injury onset date and time^LN | YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ] | [empty] |  |
| Fasting Status of patient at time of specimen collection. | CWE | 49541-6^Fasting status [Presence] - Reported^LN | HL7 TABLE 0916 | [empty] | Fasting status can also be transmitted in OBR.13 (Relevant Clinical Information) using a a coded value from HL7 Table HL70916. (preadoption of V2.7?) |
| Pregnancy status of (female) patient at time of specimen collection. | CWE | 11449-6^Pregnancy status^LN | CHOICEe: 1) HL7 Table 0532 \*\*\*Table 0532 expands on the original Yes/no indicator table by including "flavors of null". It is intended to be applied to fields where the response is not limited to "yes" or "no". 2) OR consider SNOMED Codes SNOMED value Set: 261665006^Unknown 7738600^ Patient currently pregnant 60001007^Not pregnant  3) OR PHVS\_YesNoUnknown\_CDC, a YNU table from PHINVADs Which is a mashup of HL7 Table 0136 - Yes/no Indicator aND NULLFLAVOR of UNK - this could be represented by a constrained table 0532 as well. | [empty] |  |

Example:

…

(After OBR )

ORC||……

OBR|1|23456^EHR^2.16.840.1.113883.19.3.2.3^ISO|56789PHL222^XYZSPHL^2.16.840.1.114222.4.1.10412^ISO|1234^N.gonorrhoeae Culture and Smear^L^^^^2008|||….

OBX|1|CWE|664-3^Gram Stn XXX^LN^30097^Gram Stain^L^2.34^v unknown|1|83410001^Gram-negative ….

OBX|2|NM|21612-7^Age – Reported^LN^A^Patient Age^L^2.34^1||46|a^year^UCUM^yr ^years^L^1.7^1.1|||||F…

OBX|3|CWE|11449-6^Pregnancy status^LN^A^Pregnancy Status^L^2.34|1|77386006^Patient currently pregnant^SCT^^^^01/31/2011|…

SPM…

Example:

…

(After SPM)

ORC||……

OBR|1|23456^EHR^2.16.840.1.113883.19.3.2.3^ISO|56789PHL222^XYZSPHL^2.16.840.1.114222.4.1.10412^ISO|1234^N.gonorrhoeae Culture and Smear^L^^^^2008|||….

OBX|1|CWE|664-3^Gram Stn XXX^LN^30097^Gram Stain^L^2.34^v unknown|1|83410001^Gram-negative ….

SPM|1|…

OBX|1|NM|21612-7^Age – Reported^LN^A^Patient Age^L^2.34^1||46|a^year^UCUM^yr ^years^L^1.7^1.1|||||F…

OBX|2|CWE|11449-6^Pregnancy status^LN^A^Pregnancy Status^L^2.34|1|77386006^Patient currently pregnant^SCT^^^^01/31/2011|…

## Specimen type when testing isolates/reference cultures

Based on feedback from multiple jurisdictions, sending information about the original clinical specimen type/source. ( e.g. Stool) in SPM.4 is preferred over reporting a derivative of the specimen (e.g. an isolate , DNA, or RNA).

## Animal rabies results

This IG includes in its scope animal rabies test results reporting. However the ORU^R01 message lacks the necessary elements to send demographic information on exposed individuals and animals as well as providers of exposed individuals, even though this is information is typically collected by the public health laboratories who perform all of the post-mortem animal rabies testing in the US.

The author suggests reviewing the various approaches using the ORU^R01 message structure for sending this data or consider whether an alternative message structure is more suitable for animal rabies reporting. ( review the NAHLN message)

## 

## Snapshot processing: examples of partial, Final and corrected messages

Seemed to be an issue for implementers and should say something about this?

# Appendix A: Clinical Laboratory Improvements Amendment Considerations, US Realm Only

In the United States, Clinical Laboratory testing of human specimens is regulated by the Clinical Laboratory Improvements Amendments of 1988 (CLIA). Several sections of the regulations implementing CLIA impact how electronic laboratory is formatted for the US Realm and these changes are outlined in this appendix. Impacted areas include mandatory reporting requirements, report retention and display, and those authorized to receive a report. Specifics on the CLIA Regulation are found at <http://wwwn.cdc.gov/clia/regs/toc.aspx>.

Appendix A: 1 Mandatory Reporting Requirements

Section 493.1291 of the CLIA Regulations defines items that must appear on a clinical laboratory report in the US (<http://wwwn.cdc.gov/clia/regs/subpart_k.aspx#493.1291>). Interpretative Guidelines on the elements required in a report may be found at <http://www.cms.hhs.gov/CLIA/downloads/apcsubk2.pdf>. Specific report fields impacted include the following:

| Table A-1 – Mandatory Reporting Requirements | | |
| --- | --- | --- |
| Segment | Field | CLIA Impact |
| PID-3 | Patient Identifier List | A unique patient identification number is required |
| PID-5 | Patient Name | Positive patient identification required. If the patient’s name is known, this must be that name. If it is not known, a unique patient identifier must be assigned. |
| OBX-3 | Observation Identifier[[9]](#footnote-9) | Unique identification of the test performed is required. LOINC® is an HL7-approved code system and shall be used for the Observation Identifier as described in the appropriate HITSP Interoperability Specification. Use of LOINC codes for additional tests is strongly encouraged. See *Section 6* for more details. Addition of a local laboratory code is allowed.  For certain tests CLIA requires additional information:  Laboratories using manufacturer's instruments, kits or test systems labeled for "investigational use only" or "research use only" must clearly state that the test results are not to be used for treatment or diagnostic purposes. If results of such tests are being reported without a disclaimer statement, or are being used by the provider for patient care, they are in the same category as in-house developed tests and the laboratory must establish performance specifications in accordance with §493.1253.  The disclaimer for Analyte Specific Reagents (ASR) should state, "This test was developed and its performance characteristics determined by (Laboratory Name). It has not been cleared or approved by the U.S. Food and Drug Administration." The ASR disclaimer on the test report is required by the FDA under *21 CFR, Part 809.30, "Restrictions on the sale, distribution and use of analyte -specific reagents."* |
| OBX-5 | Observation Value | The laboratory result is required. No regulatory requirements are specified, outside of readability, regarding result appearance. |
| OBX-6 | Units | Units, if required, or an interpretation must be given. For tests such as genetic screens the interpretation may actually be the test result. |
| OBX-7 | Reference Range | Required. |
| OBX-8 | Abnormal flag. | Use is not required, but a laboratory may use this field as part of its interpretation guidance. If reported, it should be displayed by an EHR. |
| OBX-11 | Observation Result Status | Used to reflect CLIA required conditions such as specimen acceptability, result corrections, cancellations as well as report status (§493.1291 (c)(7) and (k)(1,2). See SPM-21 and -22 below. |
| OBX-19 | Date/Time of Analysis | Use this field to meet the requirement for test report time. |
| OBX-23, 24, 25 | Laboratory Identification Fields | The identification of the performing laboratory is required. Populating with the CLIA ID Number in OBX-23 meets the requirement if this receiving EHR has access to a look-up table that will convert the CLIA ID number to full demographics comprising OBX-23,Performing Organization Name; OBX-24, Performing Organization Address; and OBX-25, Performing Organization Medical Director. If the CLIA ID number is not used, all demographic fields (OBX-23, OBX-24 and OBX-25) must be populated with appropriate information. |
| SPM-4 | Specimen Type | Reporting requirements call for the specimen source, which equates to the Specimen Type in the SPM segment. |
| SPM-21 | Specimen Reject Reason | Use this field in connection with OBX-11 if a test is cancelled for specimen related reason. SNOMED-CT is the recommenced terminology. |
| SPM-22 | Specimen Quality | Use this field to provide a coded version for Specimen Description. For Electronic Health Records, it is preferred that this field be used in place of, or in connection with, SPM-14. SNOMED-CT is the recommenced terminology. |

**A.2 Report Retention**

While this section is not to be construed as legal advice, the electronic message from a performing laboratory is presumed to be the legal report of the tests performed. Hence, the receiver must save the content of the message for the same time period as required for any other legal document.

**A.3 Authorized Parties**

Local laws, generally at the State level, govern who is authorized to receive laboratory reports. CLIA restricts the availability of those authorized to receive laboratory reports to just those approved at the local level and sets no national standards. Testing laboratories may not report results to unauthorized parties under CLIA.

**Testing laboratories either have a trusted relationship with the ordering party or presume that the ordering party is authorized to receive results. However, testing laboratories need not have knowledge of the appropriateness of others requested to receive results, such as "Copy to" recipients. To maintain CLIA compliance, a US testing laboratory may choose to restrict its reports to only those recipients known to be authorized. Hence, copies of a result need not be sent by a testing laboratory. Note that CLIA places no restrictions on the receiver of a laboratory report regarding its retransmission of the report to others.**

# Appendix B: Gap Analysis between the LRI\_GU\_RU Profile and the PHLabResult + PHLabResult -Ack Profile

When a laboratory result is sent to public health, additional data is required to be sent along in the result message when compared to the LRI use case. Since there are many more constrained elements in the ELR251 profile compared to the LRI \_GU\_RU profile. It is possible to create an LRI that is conformant to the PHLabReport + PHLabRepot-Ack Profile components by the creation of an additional LRI component profile , LRI\_PH\_COMPONENT – ID: 2.16.840.1.113883.9.NNN, which is defined in Section 1.12.2 above. The two profile components below indicates valid MSH-21 combinations for declaring conformance to the ELR Result profile. In other words they are the same.

LRI\_GU\_RU\_Profile + LRI\_PH\_COMPONENT = PHLabReport + PHLabReport-Ack

This Section is a detailed summary gap analysis to detail the additional data required by the ELR use case.

**Conformance Usages:**

The element PID.35 usage is not in conformance with the LRI and therefore ***the LRI\_PH\_Component message profile cannot be used to transmit animal rabies results***.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Segment | Seq | LRI\_HL7 element Name | ELR\_Usage | LRI\_Usage |
| **PID** | **35** | Species Code | RE | X |

The following tables outline the constrained elements in the ELR251R2 Results profiles that are undefined in the LRI Results profile:

| ELR\_LRIfieldCompareTable | | | | |
| --- | --- | --- | --- | --- |
| Segment | Sequence | HL7 Element Name | ELR\_Usage | LRI\_Usage |
| MSH | 5 | Receiving Application | R | O |
| SFT | Software Segment |  | R | O |
| SFT | 6 | Software Install Date | RE | O |
| PID | 6 | Mother’s Maiden Name | RE | O |
| PID | 11 | Patient Address | RE | O |
| PID | 13 | Phone Number – Home | RE | O |
| PID | 14 | Phone Number – Business | RE | O |
| PID | 22 | Ethnic Group | RE | O |
| PID | 29 | Patient Death Date and Time | RE | O |
| PID | 30 | Patient Death Indicator | RE | O |
| PID | 33 | Last Update Date/Time | RE | O |
| PID | 34 | Last Update Facility | C(R/RE) | O |
| NK1 | Next of Kin / Associated Parties |  | RE | O |
| NK1 | 2 | Name | C(R/X) | O |
| NK1 | 3 | Relationship | RE | O |
| NK1 | 4 | Address | RE | O |
| NK1 | 5 | Phone Number | RE | O |
| NK1 | 13 | Organization Name – NK1 | C(R/X) | O |
| NK1 | 30 | Contact Person’s Name | C(R/RE) | O |
| NK1 | 31 | Contact Person’s Telephone Number | RE | O |
| NK1 | 32 | Contact Person’s Address | RE | O |
| VISIT |  |  | RE | O |
| PV1 | 1 | Set ID - PV1 | R | O |
| PV1 | 4 | Admission Type | RE | O |
| PV1 | 44 | Admit Date/Time | RE | O |
| PV1 | 45 | Discharge Date/Time | RE | O |
| ORC | 14 | Call Back Phone Number | C(RE/X) | O |
| ORC | 21 | Ordering Facility Name | R | O |
| ORC | 22 | Ordering Facility Address | R | O |
| ORC | 23 | Ordering Facility Phone Number | R | O |
| ORC | 24 | Ordering Provider Address | RE | O |
| OBR | 17 | Order Callback Phone Number | RE | O |
| OBR | 31 | Reason for Study | RE | O |
| OBR | 32 | Principal Result Interpreter | RE | O |
| OBX | 17 | Observation Method | RE | O |
| NTE | 1 | Set ID – NTE | R | O |
| NTE | 2 | Source of Comment | RE | O |
| NTE | 4 | Comment Type | RE | O |
| SPM | 2 | Specimen ID | R | O |
| SPM | 5 | Specimen Type Modifier | RE | O |
| SPM | 6 | Specimen Additives | RE | O |
| SPM | 7 | Specimen Collection Method | RE | O |
| SPM | 8 | Specimen Source Site | RE | O |
| SPM | 9 | Specimen Source Site Modifier | RE | O |
| SPM | 11 | Specimen Role | RE | O |
| SPM | 12 | Specimen Collection Amount | RE | O |
| SPM | 18 | Specimen Received Date/Time | R | O |
| OBX | Observation/Result for SPM |  | RE | O |

The following Tables outlines the elements in the ELR251R2 Results Profiles that are more constrained ( “tighter” usage) than in the LRI Results profile::

**Fields and Segments**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Segment | Sequence | HL7 Element Name | ELR\_Usage | LRI\_Usage |
| MSH | 3 | Sending Application | R | RE |
| MSH | 6 | Receiving Facility | R | RE |
| OBR | 8 | Observation End Date/Time | C(RE/X) | RE |
| OBX | 5 | Observation Value | C(R/RE) | RE |
| OBX | 8 | Abnormal Flags | C(R/RE) | RE |
| OBX | 14 | Date/Time of the Observation | C(R/RE) | RE |
| ORC | 2 | Placer Order Number | C(RE/X) | RE |
| SPECIMEN | group |  | C(R/RE) | RE |
| SPM | 17 | Specimen Collection Date/Time | R | RE |

**Components and Subcomponents**

| **LRI\_Data Type Elements** | **ELR\_Data Type Elements** | **DT** | **HL7 Element Name** | **ELR\_Usage** | **LRI\_Usage** |
| --- | --- | --- | --- | --- | --- |
| LRI\_CWE\_CR.7, LRI\_CWE\_CRE.7,  LRI\_CWE\_CRO.7 | CWE\_CR.7,  CWE\_CRE.7,  CWE\_CRO.7 | ST | Coding System Version ID | RE | O |
| LRI\_CWE\_CR.8,  LRI\_CWE\_CRE.8,  LRI\_CWE\_CRO.8 | CWE\_CR.8,  CWE\_CRE.8,  CWE\_CRO.8 | ST | Alternate Coding System Version ID | RE | O |
| LRI\_CX\_GU.6 | CX.8 | HD | Assigning Facility | RE | O |
| LRI\_XCN\_GU.14 | XCN.14 | HD | Assigning Facility | RE | O |
| LRI\_XON\_GU.2 | XON.2 | IS | Organization Name Type Code | RE | O |
| XPN.5 | XPN.5 | ST | Prefix (e.g., DR) | RE | O |
| XPN.7 | XPN.7 | ST | Professional Suffix | RE | O |

Other issues:

Time stamps – review.

1. http://www.ietf.org/rfc/rfc2119.txt [↑](#footnote-ref-1)
2. There are multiple interpretations of “RE” when a value is known. One is “the capability must always be supported and a value is sent if known”, the other is “the capability must always be supported and a value may or may not be sent even when known based on a condition external to the profile specification. The condition may be noted in the profile but cannot be processed automatically”. This is what can be interpreted from the “relevant” part of the definition. Regardless of the interpretation the “RE” usage code, a set of test circumstances can be developed to sufficiently test the “RE” element. See the “Conformity Assessment of Conformance Constructs” section for more details. [↑](#footnote-ref-2)
3. Conditional on certain reportable conditions and also dependent upon individual state laws/regulations. [↑](#footnote-ref-3)
4. <http://www.hl7.org/implement/standards/product_brief.cfm?product_id=210> [↑](#footnote-ref-4)
5. From HL7 v2.8 standard for ballot : The message profile is normatively expressed as an XML document validated against the normative message profile Schema, it may be registered on the HL7 web site (see Section , ""). The normative table definition can partly or wholly be contained in the message profile XML document. The table definition can also be partly or wholly defined in a table library. The table library is normatively expressed as an XML document validated against the normative table library Schema, it may be registered on the HL7 web site; (see Section , ""). [↑](#footnote-ref-5)
6. Valid structure:

   Case 1: OBX.5 populated, OBX.8 empty and OBX.11 <> X

   Case 2: OBX.5 empty, OBX.8 populated and OBX.11 <> X

   Case 3: OBX.5 populated, OBX.5 populated and OBX.11 <> X

   Case 4: OBX.5 empty, OBX.8 empty and OBX.11 = X

   Invalid structure:

   Case 5, 6 and 7:   OBX.5 and/or OBX.8 populated and OBX.11 = X

   Case 8: OBX.8 empty, OBX.5 empty and OBX.11 <> X [↑](#footnote-ref-6)
7. From Section 3.1.2. Concept Identifiers SNOMED CT User Guide- July 2012 International Release (US English), ([www.snomed.org/ug.pdf](http://www.snomed.org/ug.pdf)). [↑](#footnote-ref-7)
8. Standards & Interoperability Framework (S&I) Public Health Reporting Initiative (PHRI) Data Harmonization Profile Version 1.5. PHRI has developed this data harmonization profile to reflect the common core data elements for public health reporting, including harmonized data element names, descriptions, formats, and value sets. Currently this document is being balloted within the S&I PHRI work group and is available at: <http://wiki.siframework.org/file/view/DRAFT_DataHarmonizationProfile_V1%205.docx/378300894/DRAFT_DataHarmonizationProfile_V1%205.docx> [↑](#footnote-ref-8)
9. While CLIA requires a laboratory to maintain positive identification of a specimen reporting, that information as part of the result is not required. [↑](#footnote-ref-9)