Implementation Guide for Transmission of Microbiology Result Messages as Public Health Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol

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Centers for Disease Control and Prevention

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Revision History

Date	Author	Comments
01-Oct-02	J. Marc Overhage	Initial draft
14-Feb-03	J. Marc Overhage	Major revision after feedback from multiple reviewers
9-May-03	Scott Robertson	Editorial revision for internal consistency and integrity check against HL7 v2.3.1.
27-May-03	Scott Robertson	Final editorial changes to move document out of "draft" status

Notes

- www.bls.gov/soc/ occupational classification system adopted by multiple federal agencies

Credits

A working group (members are listed in the Appendix) convened by the CDC and the eHealth Foundation's Public Private Collaboration created materials that formed the basis for this implementation guide.

Introduction

Historically infectious diseases have been a major focus of public health agencies. Consequently, clinical microbiology data are important for public health activities. Clinical microbiology data are usually stored in laboratory information systems at nearly all laboratories that perform this testing. These systems are able to export data in HL7

format. Even though HL7 is a well-defined standard, there is considerable variability in the way that the laboratory information systems create the messages that contain the microbiology results.

Microbiology results messages are particularly difficult to implement because:

- Results are updated periodically – organism name changes

- There is related data – organisms with a culture, sensitivities with an organism, may be several different methodologies for sensitivities.

- There is a lot of relevant data – what specimen, source of the specimen, what kind of culture was done including what method was used, what organisms were found, other observations about the specimen (Gram Stain etc), the sensitivity of the organisms to antibiotics.

This implementation guide discusses how to structure microbiology result messages to be sent for public health purposes using the HL7 Version 2.3.1 standard message protocol. At the time this guide is being written HL7 Version 3.0 is not a declared standard and many more laboratories are able to generate Version 2.3.1 messages than can generate Version 3.0 messages.

Scope

This implementation guide focuses microbiology results messages as a means to send results, which are not organism specific, to public health agencies.

Because some microbiology tests are simple, particularly those that are organism specific (*e.g.*, DNA probes and tests for specific antigens), their results can be reported following the same rules as for chemistry and similar laboratory test results. Refer to the *Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol* for further information. For example, a Gram Stain is usually reported as a simple result consisting of a text description of the observations.

Microbiology tests that are not organism specific (blood cultures or sputum cultures) are more complicated to report because they may not grow any organism at all or they may grow more than one organism. Antibiotic sensitivity studies are often performed on these isolates, each of which has several associated results. This hierarchy of results:

order

→ multiple specimens

→ multiple cultures

→ multiple isolates

→ multiple sensitivities

combined with the fact that the results may "evolve" over time: the organism first reported as a "Gram Negative Diplococci", followed by a report showing "Neisseria species, penicillin-sensitive", and with a final report of "Neisseria meningitidis, penicillin-sensitive". This guide exists in order to address these complicating factors in a consistent manner.

This guide does not stand alone – it should be read in conjunction with CDC's "*Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol*" and the HL7 Version 2.3.1 standard. Many specifics for segments other than the OBR and the OBX are specified in these related.

Message transmission in real time or in batch mode is not covered in this guide. These are provided in the "*Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol*" and the HL7 Version 2.3.1 standard.

Definitions

Electronic Laboratory-based Reporting (ELR): the transmission of data of public health importance from clinical laboratories to public health agencies in electronic format. Ideally, data transmitted by ELR would be automated and would use standardized codes for tests and results allowing for more timely and complete reporting.

Panel: (also **Battery**) when used in the context of a microbiology result, a panel refers to a collection of test results that are conceptually related to each other as a single orderable entity. Such as for a culture (*e.g.*, blood culture).

Isolate: a "pure" strain of microorganism separated from a mixed bacterial or fungal culture. There may be multiple isolates from a single specimen.

Susceptibility: susceptibilities are a set of one or more observations about the resistance or vulnerability of an isolate to a drug, often an antibiotic. There are multiple methods by which susceptibility can be measured including disc diffusion or Kirby-Bauer, MIC (Minimum Inhibitory Concentration), E-test (or Gradient Strip), MLC (Minimum Lethal Concentration) or MBC (Minimum Bactericidal Concentration), and SBT (Serum Bactericidal Titer).

Reflex order: (also **Consequent order, Child Order**) There are specific circumstances when the laboratory will, based on the results of a test, perform additional testing beyond that originally ordered. This testing typically further clarifies the result. For example, when an organism is isolated from a culture, a series of sensitivity tests will be performed

Microbiology tests: Microbiology tests includes all tests used to identify microorganisms and evidence for infection by specific organisms as well as cultures, direct microscopic exams that identify organisms or prove evidence for present or past infection with specific organisms. It is usually defined by LOINC code 18725-2 MICROBIOLOGY TESTS (SET). Microbiology includes tests for antibodies, antigens, DNA and RNA. The LOINC serology class does not include measures of antibodies or antigens related to microorganisms. The LOINC molecular pathology class does not include RNA or DNA based tests for infectious organisms. (They are all included in microbiology.)

Conventions

In order to provide concrete guidance, each message use case will be presented in three versions: as a message segment structure, message schema and message example.

Message Segment Structure

Also known as the HL7 Abstract Message Syntax. This format specifies the order of HL7 segments and segment groups, whether they are optional or mandatory, and whether or not they repeat. It does not include detailed information about the data elements within the segments. It illustrates the overall structure of the message.

Message Schema

This format describes how data elements within segments are valued, typically using generic terms (e.g. date of birth, medical record number). It illustrates the content of the message.

Message Example

This format provides a concrete example of individual data elements within the segments of a message. It illustrates the formatting of individual data elements.

Generic Microbiology Result Message

	Generic microbiology result message
MSH	message header
PID	patient identification
[PV1]	Patient visit information
{	--- Order Begin
[ORC]	order control
OBR	Observation request
[{ NTE }]	notes and comments
{	--- Observation Begin
[OBX]	Observation
[{ NTE }]	notes and comments
}	--- Observation End
}	--- Order End

The generic microbiology message segment structure above represents a superset of all microbiology result message segment structures. It supports several scenarios including:

- a culture without any organisms identified

- a culture with multiple organisms identified but their susceptibilities not yet determined

- a single susceptibility.

Segment Definitions

The Segment Attribute Table summarizes the field content of a specified segment. The column headers for the Segment Attribute Table are described as follows:

Segment Attribute Table Header Definitions

Header Text	Description
SEQ	The sequence of the elements as they are numbered in the segment.
LEN	The length of the element.
DT	The data type of the element.
OPT	Whether the field is required, optional, or conditional in a segment as defined by HL7 2.3.1. These do not refer to requirements for reporting in the context of this guide. The designations are:
	R Required.
	O Optional.
	C Conditional on the trigger event or on some other field(s). The field definitions following the segment attribute table should specify the algorithm that defines the conditionality for the field.
	X Not used with this trigger event.
	B Left in for backward compatibility with previous versions of HL7. The field definitions following the segment attribute table should denote the optionality of the field for prior versions.
RP/#	Indicates if element repeats. IF the number of repetitions is limited, the number of allowed repetitions is given.
TBL#	Specific table reference. Tables defined in HL7 v2.3.1 and used in this guide are listed in Appendix B.
ITEM#	HL7 unique item number for each element.
Element Name	Descriptive name of element in the segment.
OPT for ELR	Whether the field is required or ignored specifically in the context of this guide. The designations are:
	R Required.
	I Ignored.
REP for ELR	Whether the field can repeat in the context of this guide. Follows the same convention as RP/#.
IMPLEMENTATION COMMENTS	Addition comments related to the use of the field in the context of this guide.

The field definitions following the Segment Attribute Table serve to clarify, extend or constrain the meaning or intent of the field in the context of this guide. Not all fields present in a segment will have accompanying narrative.

Linking a susceptibility result to a culture

Many people writing or reading HL7 messages are confused the approach to linking an organism's antibiotic susceptibility results to the culture in which the organism was originally isolated. The confusion arises from several sources. First source is due to the fact that susceptibility test results are reported from "consequent" or "reflex" orders – the provider does not usually order them but rather the laboratory automatically performs them if the culture is "positive." This practice results in two or more different results in response to the initial order. The first result contains the organisms identified in the culture. Additional results contain the antibiotic susceptibility for each organism isolated. The HL7 standard uses the terminology "parent" to describe the culture result and "child" to describe the susceptibility result. The second complication is that the culture results can "evolve" over time. Additional isolates may be added and the name used to describe isolates may change, even after the sensitivity result is generated.

The primary method for linking susceptibility results to the specific organism in the original culture result is to repeat the information from the culture with the susceptibility result by utilizing the HL7 *OBX-4-observation sub-ID* mechanism. The sub-IDs within a culture result message should be sequentially numbered, *relative to the isolates*, with integers starting at 1. The order in which the isolates appear (and hence the value of their sub-ID) is arbitrary. The only requirement is that the order (and hence the value of their sub-ID) must remain constant over all messages related to this culture result. The first OBX with sub-ID value "n" will contain a value (in OBX-5) identifying the nth microorganism. Each additional OBX with sub-ID value "n" will contain susceptibility values for a given antimicrobial sensitivity test on this organism.

When a message includes repeating OBX segments, the *OBX-1 Set ID - OBX* is sequentially numbered with integers beginning with 1 for each grouping of segments. For example:

a) A single group of OBX segments.

```
OBR|1|…      1ST segment of group
OBX|1|…      1st observation segment of group
OBX|2|…      2nd observation segment of group
OBX|3|…      3rd observation segment of group
```

b) A repeating group of segments that includes the OBX segment

```
OBR|1|…      first group – typically first organism
OBX|1|…
OBX|2|…
OBX|3|…
```

```
OBX|4|…
OBR|2|…       second group – typically the second organism
OBX|1|…
OBX|2|…
OBX|3|…
OBX|4|…
OBR|3|…       third group – typically the third organism
OBX|1|…
OBX|2|…
OBX|3|…
OBX|4|…
```

In addition to using *OBX-1 Set ID - OBX* and *OBX-4-observation sub-ID*, a parent-child link mechanism also exists to associate child observations to specific isolates in the culture report. *OBR-26 Parent Result* and *OBR-29 Parent* data elements of each susceptibility (child) message contain data needed to link back to the culture result (parent) message. The combination of *OBR-26 Parent Result* and *OBR-29 Parent* uniquely identify the specific OBX segment in the original culture result (parent) message. This parent-child link is described in greater detail in the Segment Detail section for the OBR segment.

Organism names

As a culture is processed, more information is gained about the isolate and the laboratory may be able to assign a more specific name. When a more specific isolate name is assigned, a new message group for the culture and all its associated organisms is generated. The numbering of the organisms in OBX-5, observation sub-ID is critical: it should remain constant, even though the organism name will change in its OBX segment.

Use Case

Scenarios

Some uses of microbiology messages that need to be supported are:

1) A grouping representing the receipt or login of a specimen with no test results.

2) A grouping representing an ordered test (the culture with specimen/order related information) and its result (the organisms).

3) A grouping representing one parent culture result for a single organism using two different methods

4) A grouping representing one parent culture result for a single organism using one method.

5) Deleting a previously identified organism

Clinical Scenario

In order to provide a concrete basis for discussion, the following scenario will be used for all examples. A physician, Dr Robert Good, has ordered a sputum culture on patient Michael D Able. The following narrative describes the results from LabOne, which are to be reported to a public health agency.

```
Orderable Item Description: Sputum culture
Source:               Sputum
Placer / ordered by:   DrGood
Placer order number:   0889436
Filler / performed by: OneLab
Filler order number:   ABC01234
```

Day 1:

Gram Stain observation:

```
Moderate WBC Few Squamous Epithelial Cells Many Gram Positive Cocci In
Pairs, Chains And Groups Few Gram Negative Diplococci Moderate Gram
Negative Bacilli Few Gram Positive Bacilli Few Yeast
```

Culture observation:

```
In lab
```

Day 2:

Culture observation:

```
Light growth of usual respiratory flora
```

Isolate #1 observation:

```
Gram Positive Cocci Moderate Growth
```

Isolate #2 observation:

```
Gram Positive Cocci in Groups, Light Growth
```

Isolate #3 observation:

Gram Negative Bacilli, Moderate Growth

Isolate #4

Light Growth Candida albicans

Day 3:

Isolate #1 observation:

Moderate Growth Staphylococcus aureus

Isolate #2 observation:

Light Growth Beta Hemolytic Streptococcus Group A

Isolate #3 observation:

Moderate Growth Haemophilus influenzae Beta-Lactamase Positive

Isolate #4

Light Growth Candida albicans

Day 4:

Test Comment:

Isolates will be retained 21 days in the event further testing is required.

Culture observation:

Light Growth Usual Respiratory Flora

Isolate #1 observation:

Moderate Growth Staphylococcus aureus

```
    MIC (mcg/ml)
    Ampicillin              32      R
    Amoxicillin/Clavate     2       S
    Cefazolin               8       S
    Cefepime                8       S
    Cefotaxime              8       S
    Ciprofloxacin           1       S
    Clindamycin             0.25    S
    Erythromycin            0.25    S
    Imipenem                2       S
    Penicillin              32      R
```

```
    Tetracycline              0.25    S
    Vancomycin                2       S
```

Isolate #2 observation:

```
Light Growth Beta Hemolytic Streptococcus Group A
```

Isolate #3 observation:

```
Moderate Growth Haemophilus influenzae Beta-Lactamase Positive

    Kirby Bauer (mm)
    Ampicillin                S
    Augmentin                 S
    Cefazolin                 S
    Chloramphenicol           R
    Sulfa/Trimethoprim        S
    Cefotaxime                S
    Ciprofloxacin             S
    Cefixime                  S
    Imipenem                  S
    Cefuroxime                S
    Tetracycline              R
```

Isolate #4 observation:

```
Light Growth Candida albicans
```

Representing the receipt or log in of a specimen with no results (Scenario 1)

Message Segment Structure

This message structure is a proper subset of HL7 v2.3.1 ORU_R01. This limited structure addresses the minimum content requirements to represent the receipt of log in of a specimen with no results.

ORU^R01^ORU_R01	Observational Results (Unsolicited)	Chapter
MSH	Message Header	2
PID	Patient Identification	3
[{ NK1 }]	Next of Kin/Associated Parties	3
[PV1]	Patient Visit	3
[ORC]	Order common	4
OBR	Observations Request	7

Message Schema

```
MSH|^~\&| sending application | sending facility |
   receiving application |||| ORU^R01^ORU_O01| message
   control id |P|2.3.1…<cr>

PID||| patient ids || patient name …<cr>

NK1| set id | next of kin name | next of kin relationship |
   next of kin phone …<cr>

ORC| order control code | requestor's order number |
   processor's order number ||||| transaction date-time |
   enterer Id || ordering provider ID | enterer's location
   …<cr>

OBR| set id | requestor's order number | processor's order
   number | universal service id for test ordered |||
   observation date-time ||||||| specimen received date-
   time | specimen source | ordering provider |||||
   Results rpt/status change date-time || Diagnostic serv
   sect ID | result status …<cr>
```

Message Example

The following message example represents a message from LabOne (application LabOneApp, CLIA ID 45D0470381) to NEDSS sent on 10/01/2001 at 9:32 am. The message is a report (ORU^R01) regarding an order for a Routine Sputum Culture (LOINC® 6460-0) of Sputum taken from patient Michael D Able (known to Dr Good by MRN 999-3). Dr Good's order number is 0889436, LabOne's order number is ABC012345. The order was dated 10/01/2001 8:23 am. This report (ORC-1 = "RE") is dated 10/02/2001 9:21 am by Steve Roberts (LabOne employee L0234) that the Microbiology Service (MB) has received the specimen but results are not yet available (OBR-25 = "I").

```
MSH|^~\&|LabOneApp|LabOne^45D0470381^CLIA|NEDSS^1644^WA-
   DOH||20011001093245||ORU^R01^ORU_R01|113445|P|2.3.1<cr>

PID|||999-3^^^GoodDr^MR||Able^Michael^D^^^^L<cr>

ORC|RE|0889436^GoodDr|ABC012345^LabOne||||||20011001093245|
   L0234^Roberts^Steve^^^^^LabOne^L^^^EI
   ||^Good^Robert^^^^MD^^L<cr>

OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^Spt Routine
   Cult^LN|||20011001091234|||||||200110010823|SPT&
   Sputum&HL70070|^Good^Robert^^^^MD^^L||||||20011001093245
   ||MB|I<cr>
```

Representing an individual test (other than a culture) that identifies an organism (Scenario 2)

Message Segment Structure

This message structure is a proper subset of HL7 v2.3.1 ORU_R01. This limited structure addresses the minimum content requirements to represent an individual test (other than a culture) that identifies an organism.

ORU^R01^ORU_R01	Observational Results (Unsolicited)	Chapter
MSH	Message Header	2
PID	Patient Identification	3
[{ NK1 }]	Next of Kin/Associated Parties	3
[PV1]	Patient Visit	3
{		
[ORC]	Order common	4
OBR	Observations Request	7
{ OBX }	Observation/Result	7
}		

Message Schema

MSH|^~\&| *sending application | sending facility | receiving application* |||| ORU^R01^ORU_O01| *message control id* |P|2.3.1…<cr>

PID||| *patient ids* || *patient name* …<cr>

NK1| *set id | next of kin name | next of kin relationship | next of kin phone* …<cr>

ORC| *order control code | requestor's order number | processor's order number* ||||| *transaction date-time | enterer Id* || *ordering provider ID | enterer's location* …<cr>

OBR| *set id | requestor's order number | processor's order number | universal service id for test ordered* ||| *observation date-time* |||||||| *specimen received date-time | specimen source | ordering provider* |||||| *Results rpt/status change date-time* || *Diagnostic serv sect ID | result status* …<cr>

```
OBX| set id | value type | observation ID | observation
    sub-ID | observation value | units || abnormal flags ||
    result status…<cr>
```

Message Example

The following message example represents a message from LabOne (application LabOneApp, CLIA ID 45D0470381) to NEDSS sent on 10/01/2001 at 11:15am. The message is a report (ORU^R01) regarding an order for a Routine Sputum Culture (LOINC® 6460-0) of Sputum taken from patient Michael D Able (known to Dr Good by MRN 999-3). Dr Good's order number is 0889436, LabOne's order number is ABC012345. The order was dated 10/01/2001 8:23 am. This report (ORC-1 = "RE") is dated 10/01/2001 11:10 am by Steve Roberts (LabOne employee L0234) that the Microbiology Service (MB) is reporting preliminary results (OBR-25 = "P"). The particular observation is that a S pneumo Ag Spt test (LOINC® 31968-1) result was positive (SNOMED G-A200).

```
MSH|^~\&|LabOneApp|LabOne^45D0470381^CLIA|NEDSS^1644^WA-
    DOH||20011002111520||ORU^R01^ORU_R01|113481|P|2.3.1<cr>

PID|||999-3^^^GoodDr^MR||Able^Michael^D^^^^L<cr>

ORC|RE|0889436^GoodDr|ABC012345^LabOne|||||20011001111050|
    L0234^Roberts^Steve^^^^^LabOne^L^^^EI
    ||^Good^Robert^^^^MD^^L<cr>

OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^Spt Routine
    Cult^LN|||20011001091234|||||||200110010823|SPT&
    Sputum&HL70070|^Good^Robert^^^^MD^^L|||||20011001111050
    ||MB|P<cr>

OBX|1|CE|31968-1^S pneumo Ag Spt Ql^LN|1|G-
    A200^positive^SNM<cr>
```

Representing a culture (Scenario 2)

Message Segment Structure

This message structure is a proper subset of HL7 v2.3.1 ORU_R01. This limited structure addresses the minimum content requirements to represent an individual test (other than a culture) that identifies an organism.

ORU^R01^ORU_R01	Observational Results (Unsolicited)	Chapter
MSH	Message Header	2
PID	Patient Identification	3
[{ NK1 }]	Next of Kin/Associated Parties	3
[PV1]	Patient Visit	3

{		
[ORC]	Order common	4
OBR	Observations Request	7
{ OBX }	Observation/Result	7
}		

Message Schema

MSH|^~\&| *sending application | sending facility | receiving application* |||| ORU^R01^ORU_001| *message control id* |P|2.3.1…<cr>

PID||| *patient ids* || *patient name* …<cr>

NK1| *set id | next of kin name | next of kin relationship | next of kin phone* …<cr>

ORC| *order control code | requestor's order number | processor's order number* ||||| *transaction date-time | enterer Id* || *ordering provider ID | enterer's location* …<cr>

OBR| *set id | requestor's order number | processor's order number | universal service id for test ordered* ||| *observation date-time* |||||||| *specimen received date-time | specimen source | ordering provider* |||||| *Results rpt/status change date-time* || *Diagnostic serv sect ID | result status* …<cr>

OBX| *set id | value type | observation ID | observation sub-ID | observation value | units* || *abnormal flags* || *result status*…<cr>

Message Example

The following message example represents a message from LabOne (application LabOneApp, CLIA ID 45D0470381) to NEDSS sent on 10/02/2001 at 10:20am. The message is a report (ORU^R01) regarding an order for a Routine Sputum Culture (LOINC® 6460-0) of Sputum taken from patient Michael D Able (known to Dr Good by MRN 999-3). Dr Good's order number is 0889436, LabOne's order number is ABC012345. The order was dated 10/01/2001 8:23 am. This report (ORC-1 = "RE") is dated 10/02/2001 11:10 am by Steve Roberts (LabOne employee L0234) that the Microbiology Service (MB) is reporting preliminary results (OBR-25 = "P"). The particular observations are:

- Staphylococcus aureus identified with a colony count of 10,000 to 90,000.

- Beta hemolytic Streptococcus A identified with a colony count of <1,000

- Haemophilus influenzae identified with a colony count of 10,000 – 90,000

```
MSH|^~\&|LabOneApp|LabOne^45D0470381^CLIA|NEDSS^1644^WA-
    DOH||20011002102049||ORU^R01^ORU_R01|113522|P|2.3.1<cr>

PID|||999-3^^^GoodDr^MR||Able^Michael^D^^^^L<cr>

ORC|RE|0889436^GoodDr|ABC012345^LabOne|||||||20011001093245|
    L0234^Roberts^Steve^^^^^LabOne^L^^^EI
    ||^Good^Robert^^^^MD^^L<cr>

OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^Spt Routine
    Cult^LN|||20011002111003|||||||200110010823|SPT&
    Sputum&HL70070|^Good^Robert^^^^MD^^L||||||20011002072359
    ||MB|P<cr>

OBX|1|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|1| L-
    24801^Staphylococcus aureus^SNM<cr>

OBX|2|CE|564-5^Colony count^LN |1|10,000-90,000<cr>

OBX|3|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|2|L-
    25128^Beta hemolytic Streptococcus A^SNM<cr>

OBX|4|CE|564-5^Colony count^LN |2|<1,000<cr>

OBX|5|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|3|L-13401 ^
    Haemophilus influenzae^SNM<cr>

OBX|6|CE|564-5^Colony count^LN|3|10,000-90,000<cr>
```

Representing one culture with two susceptibility groupings for one organism (Scenario 3)

For public health use, *all* isolates should be reported. Laboratories may consider organisms to be contaminants in certain circumstances (three or more organisms in a urine culture for example). All of these isolates should be included in messages sent to public health even if the laboratory considers them to be a contaminant.

For public health use, *all* susceptibility results should always be sent. Some systems display the sensitivities only the least expensive antibiotics depending on the organism, sensitivity, source and the patient's allergies but for public health purposes, all susceptibility data is needed so it should not be filtered in any way by the sending system.

Susceptibility battery/report representation

A susceptibility result message may only contain results corresponding to a single organism that has been previously reported in a culture battery.

Each antimicrobial susceptibility result should be reported as a separate (OBX) observation where *OBX-1 Set ID - OBX* is numbered with sequential integers beginning with the integer '1' and the *OBX-3 Observation ID* is a code for the antimicrobial susceptibility test being reported. (OBX segments for non-antimicrobial observations and related information may be present in the same battery.)

The OBX segment will contain the result value in *OBX-5 Observation Value* and the interpretation for the result in *OBX-8 Abnormal Flags*. When LOINC codes are used for *OBX-3 Observation ID*, the susceptibility method is implied in the selected code (*e.g.*, LOINC® code16-6 indicates the MIC method for amoxicillin, while LOINC® code 17-4 indicates the Kirby-Bauer method). Most labs will report the MIC value in OBX-5 and the interpretation of the MIC result value in OBX-8. Similarly, for Kirby-Bauer results, labs will report the interpretation of the result (usually sensitive, resistant or intermediate and specific to the organism) in the OBX-8[*].

Identification of the organism for a susceptibility battery

The susceptibility results for each isolate should be reported with a separate OBR (this is essential in order to allow the receiving system to associate the result with the proper isolate)

It is possible that susceptibility will be reported before the final identification of an organism is completed. In this case, a placeholder OBX for the organism name must be reported in the corresponding parent culture battery so that *OBR-26-parent result* in the child susceptibility OBR will point to a valid organism OBX in the parent culture battery. Transmission of an organism OBX (in the culture battery) with the Sub-ID field valued must precede the susceptibility battery, which uses the identical Sub-ID in *OBR-26-parent result*.

Message Segment Structure

This message structure is a proper subset of HL7 v2.3.1 ORU_R01. This limited structure addresses the minimum content requirements to represent one culture with two susceptibility groupings for one organism.

ORU^R01^ORU_R01	Observational Results (Unsolicited)	Chapter
MSH	Message Header	2
PID	Patient Identification	3
[{ NK1 }]	Next of Kin/Associated Parties	3
[PV1]	Patient Visit	3
{		

---

[*] The size of the inhibitory zone could be reported as the primary observation in OBX-5 but this would be uncommon and a null value of OBX-5 is acceptable.

[ORC]	Order common	4
OBR	Observations Request	7
{ OBX }	Observation/Result	7
}		

Message Schema

```
MSH|^~\&| sending application | sending facility |
   receiving application |||| ORU^R01^ORU_O01| message
   control id |P|2.3.1…<cr>

PID||| patient ids || patient name …<cr>

NK1| set id | next of kin name | next of kin relationship |
   next of kin phone …<cr>

ORC| order control code | requestor's order number |
   processor's order number ||||| transaction date-time |
   enterer Id || ordering provider ID | enterer's location
   …<cr>

OBR| set id | requestor's order number | processor's order
   number | universal service id for test ordered |||
   observation date-time |||||||| specimen received date-
   time | specimen source | ordering provider ||||||
   Results rpt/status change date-time || Diagnostic serv
   sect ID | result status …<cr>

OBX| set id | value type | observation ID | observation
   sub-ID | observation value | units || abnormal flags ||
   result status…<cr>
```

Message Example

The following message example represents a message from LabOne (application LabOneApp, CLIA ID 45D0470381) to NEDSS sent on 10/02/2001 at 6:33pm. The message is a report (ORU^R01) regarding an order for a Routine Sputum Culture (LOINC® 6460-0) of Sputum taken from patient Michael D Able (known to Dr Good by MRN 999-3). Dr Good's order number is 0889436, LabOne's order number is ABC012345. The order was dated 10/01/2001 8:23 am. This report (ORC-1 = "RE") is dated 10/02/2001 6:29 pm by Steve Roberts (LabOne employee L0234) that the Microbiology Service (MB) is reporting preliminary results (OBR-25 = "P"). The particular observations are:

- Staphylococcus aureus identified with a colony count of 10,000 to 90,000

  - This isolate is Resistant to Ampicillin with an MIC of 32 µg/mL

- This isolate is Sensitive to Amoxicillin/Clavulanic Acid with an MIC of 2 μg/mL

- This isolate is Sensitive to Cefazolin with an MIC of 8 μg/mL

- Beta hemolytic Streptococcus A identified with a colony count of <1,000

- Haemophilus influenzae identified with a colony count of 10,000 – 90,000

  - This isolate is Sensitive to Ampicillin by Kirby-Bauer

  - This isolate is Sensitive to Amoxicillin/Clavulanic Acid by Kirby-Bauer

  - This isolate is Sensitive to Cefazolin by Kirby-Bauer

Note:	*OBR-26 - Parent Result* and *OBR-29 – Parent* in the second and third OBR segments provide "linkage" back to particular isolates in the original order/result. This is discussed in more detail in the Segment Details section for the OBX segment.

```
MSH|^~\&|LabOneApp|LabOne^45D0470381^CLIA|NEDSS^1644^WA-
    DOH||20011001183345||ORU^R01^ORU_R01|113661|P|2.3.1<cr>

PID|||999-3^^^GoodDr^MR||Able^Michael^D^^^^L<cr>

ORC|RE|0889436^GoodDr|ABC012345^LabOne|||||20011001182914|
    L0234^Roberts^Steve^^^^^LabOne^L^^^EI
    ||^Good^Robert^^^^MD^^L<cr>

OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^Spt Routine
    Cult^LN|||20011001091234|||||||200110010823|SPT&
    Sputum&HL70070|^Good^Robert^^^^MD^^L||||||20011002072359
    ||MB|P<cr>

OBX|1|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|1| L-
    24801^Staphylococcus aureus^SNM<cr>

OBX|2|CE|564-5^Colony count^LN |1|10,000-90,000<cr>

OBX|3|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|2|L-
    25128^Beta hemolytic Streptococcus A^SNM<cr>

OBX|4|CE|564-5^Colony count^LN |2|<1,000<cr>

OBX|5|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|3|L-13401 ^
    Haemophilus influenzae^SNM<cr>

OBX|6|CE|564-5^Colony count^LN|3|10,000-90,000<cr>

OBR|2||ABC012346^LabOne|29576-6^Bacterial Susc Panel
    Islt^LN|||||||||||||||||||||||||11475-1&MICROORGANISM
    IDENTIFIED:&LN^1^Staphylococcus
    aureus|||0889436&GoodDr^ABC012345&LabOne<cr>

OBX|1|CE|28-1^Ampicillin MIC^LN|1|32|μg/mL||R<cr>

OBX|2|CE|32-3^Amoxicillin+Clav MIC^LN |1|2|μg/mL||S<cr>
```

```
OBX|3|CE|76-0^Cefazolin MIC^LN |1|8|µg/mL||S<cr>

OBR|3||ABC012347^LabOne|29576-6^Bacterial Susc Panel
    Islt^LN||||||||||||||||||||||||||11475-1&MICROORGANISM
    IDENTIFIED:&LN^3^Haemophilus
    influenzae|||0889436&GoodDr^ABC012345&LabOne<cr>

OBX|1|CE|29-9^Ampicillin KB^LN|3||||S<cr>

OBX|2|CE|21-6^Amoxicillin+Clav KB^LN|3||||S<cr>

OBX|3|CE|77-8^Cefazolin KB^LN|3||||S<cr>
```

Representing one culture with one antibiotic susceptibility grouping for one organism (Scenario 4)

Message Segment Structure

This message structure is a proper subset of HL7 v2.3.1 ORU_R01. This limited structure addresses the minimum content requirements to represent one culture with one susceptibility groupings for one organism.

ORU^R01^ORU_R01	Observational Results (Unsolicited)	Chapter
MSH	Message Header	2
PID	Patient Identification	3
[{ NK1 }]	Next of Kin/Associated Parties	3
[PV1]	Patient Visit	3
{		
[ORC]	Order common	4
OBR	Observations Request	7
{ OBX }	Observation/Result	7
}		

Message Schema

MSH|^~\&| *sending application* | *sending facility* | *receiving application* |||| ORU^R01^ORU_O01| *message control id* |P|2.3.1…<cr>

PID||| *patient ids* || *patient name* …<cr>

NK1| *set id* | *next of kin name* | *next of kin relationship* | *next of kin phone* …<cr>

```
ORC| order control code | requestor's order number |
   processor's order number ||||| transaction date-time |
   enterer Id || ordering provider ID | enterer's location
   …<cr>
```

```
OBR| set id | requestor's order number | processor's order
   number | universal service id for test ordered |||
   observation date-time ||||||| specimen received date-
   time | specimen source | ordering provider ||||||
   Results rpt/status change date-time || Diagnostic serv
   sect ID | result status …<cr>
```

```
OBX| set id | value type | observation ID | observation
   sub-ID | observation value | units || abnormal flags ||
   result status…<cr>
```

Message Example

The following message example represents a message from LabOne (application LabOneApp, CLIA ID 45D0470381) to NEDSS sent on 10/02/2001 at 6:33pm. The message is a report (ORU^R01) regarding an order for a Routine Sputum Culture (LOINC® 6460-0) of Sputum taken from patient Michael D Able (known to Dr Good by MRN 999-3). Dr Good's order number is 0889436, LabOne's order number is ABC012345. The order was dated 10/01/2001 8:23 am. This report (ORC-1 = "RE") is dated 10/02/2001 6:29 pm by Steve Roberts (LabOne employee L0234) that the Microbiology Service (MB) is reporting preliminary results (OBR-25 = "P"). The particular observations are:

- Staphylococcus aureus identified

  - This isolate is Resistant to Ampicillin with an MIC of 32 μg/mL

  - This isolate is Sensitive to Amoxicillin/Clavulanic Acid with an MIC of 2 μg/mL

  - This isolate is Sensitive to Cefazolin with an MIC of 8 μg/mL

Note:	*OBR-26 - Parent Result* and *OBR-29 – Parent* in the second OBR segments provide "linkage" back to particular isolates in the original order/result. This is discussed in more detail in the Segment Details section for the OBX segment.

```
MSH|^~\&|LabOneApp|LabOne^45D0470381^CLIA|NEDSS^1644^WA-
   DOH||20011001183345||ORU^R01^ORU_R01|113732|P|2.3.1<cr>
```

```
PID|||999-3^^^GoodDr^MR||Able^Michael^D^^^^L<cr>
```

```
ORC|RE|0889436^GoodDr|ABC012345^LabOne|||||20011001182914|
   L0234^Roberts^Steve^^^^^LabOne^L^^^EI
   ||^Good^Robert^^^^MD^^L<cr>
```

```
OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^Spt Routine
    Cult^LN|||20011001091234|||||||200110010823|SPT&
    Sputum&HL70070|^Good^Robert^^^^MD^^L||||||20011002072359
    ||MB|P<cr>

OBX|1|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|1| L-
    24801^Staphylococcus aureus^SNM<cr>

OBR|2||ABC012346^LabOne|29576-6^Bacterial Susc Panel
    Islt^LN|||||||||||||||||||||||||||11475-1&MICROORGANISM
    IDENTIFIED:&LN^1^Staphylococcus
    aureus|||0889436&GoodDr^ABC012345&LabOne<cr>

OBX|1|CE|28-1^Ampicillin MIC^LN|1|32|µg/mL||R<cr>

OBX|2|CE|32-3^Amoxicillin+Clav MIC^LN |1|2|µg/mL||S<cr>

OBX|3|CE|76-0^Cefazolin MIC^LN |1|8|µg/mL||S<cr>
```

Deleting of an organism from a culture (Scenario 5)

If an organism is reported in a result and later the laboratory decides the organism should
not be part of the result (e.g. improper ID or duplicate organism) a message should be
sent with the original organism flagged as deleted in *OBX-11 Observation Result Status*.
Subsequent messages for this culture battery should include the first organism each time
with the OBX-11 set to D (i.e. organism 2 should *not* be moved up to the first organism
slot) in order to preserve the sub-id to organism association.

Message Segment Structure

This message structure is a proper subset of HL7 v2.3.1 ORU_R01. This limited
structure addresses the minimum content requirements to represent the deletion of an
organism from a culture.

ORU^R01^ORU_R01	Observational Results (Unsolicited)	Chapter
MSH	Message Header	2
PID	Patient Identification	3
[ORC]	Order common	4
OBR	Observations Request	7
{ OBX }	Observation/Result	7

Message Schema

```
MSH|^~\&| sending application | sending facility |
    receiving application ||||| ORU^R01^ORU_O01| message
    control id |P|2.3.1…<cr>
```

```
PID||| patient ids || patient name …<cr>

NK1| set id | next of kin name | next of kin relationship |
    next of kin phone …<cr>

ORC| order control code | requestor's order number |
    processor's order number ||||| transaction date-time |
    enterer Id || ordering provider ID | enterer's location
    …<cr>

OBR| set id | requestor's order number | processor's order
    number | universal service id for test ordered |||
    observation date-time ||||||| specimen received date-
    time | specimen source | ordering provider ||||||
    Results rpt/status change date-time || Diagnostic serv
    sect ID | result status …<cr>

OBX| set id | value type | observation ID | observation
    sub-ID | observation value | units || abnormal flags ||
    result status…<cr>
```

Message Example

The following message example represents a message from LabOne (application
LabOneApp, CLIA ID 45D0470381) to NEDSS sent on 10/03/2001 at 7:30 am. The
message is a report (ORU^R01) regarding an order for a Routine Sputum Culture
(LOINC® 6460-0) of Sputum taken from patient Michael D Able (known to Dr Good by
MRN 999-3). Dr Good's order number is 0889436, LabOne's order number is
ABC012345. The order was dated 10/01/2001 8:23 am. This report (ORC-1 = "RE") is
dated 10/02/2001 8:02 pm by Steve Roberts (LabOne employee L0234) that the
Microbiology Service (MB) is reporting preliminary results (OBR-25 = "P"). The
particular observation is that the previously identified isolate of Staphylococcus aureus,
with an assigned Sub-ID of 1, has been deleted from the recognized set of isolates for this
culture.

Note:	The Sub-ID assignments for the culture isolates are not altered by this deletion. This is discussed in further in the Segment Details section for the OBX segment.

```
MSH|^~\&|LabOneApp|LabOne^45D0470381^CLIA|NEDSS^1644^WA-
    DOH||20011003073022||ORU^R01^ORU_R01|113805|P|2.3.1<cr>

PID|||999-3^^^GoodDr^MR||Able^Michael^D^^^^L<cr>

ORC|RE|0889436^GoodDr|ABC012345^LabOne|||||||20011002200235|
    L0234^Roberts^Steve^^^^^LabOne^L^^^EI
    ||^Good^Robert^^^^MD^^L<cr>

OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^Spt Routine
    Cult^LN|||20011001091234|||||||200110010823|SPT&
    Sputum&HL70070|^Good^Robert^^^^MD^^L||||||20011002072359
    ||MB|P<cr>

OBX|1|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|1|L-
    24801^Staphylococcus aureus^SNM||||||D<cr>
```

Segment Details

PID – Patient Identification Segment

See *Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol* for a discussion of this segment.

NK1 – Next of Kin Segment

See *Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol* for a discussion of this segment.

ORC – Common Order Segment

See *Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol* for a discussion of this segment.

OBR – Observation Request Segment

The Observation Request (OBR) segment is used to transmit information specific to an order for a diagnostic study or observation, physical exam, or assessment. The OBR defines the attributes of a particular request for diagnostic services or clinical observations. For laboratory-based reporting, the OBR defines the attributes of the original request for laboratory testing. Essentially, the OBR describes a battery or panel of tests that is being requested or reported. The OBR is somewhat analogous to a generic lab slip that is filled out when physician requests a lab test. The individual test names and results for the panel of tests performed are reported in OBX segments, which are described below. As defined by the ORU_R01 syntax, there can be many OBX's per OBR, and there can be many OBR's per PID.

OBR – Observation Request Segment Attributes

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME	OPT for ELR	RPT for ELR	ELR IMPLEMENTATION COMMENTS
1	4	SI	O			00237	Set ID – OBR	O		Required
2	22	EI	C			00216	Placer Order Number	O		Not applicable to result messages. Not supported.
3	22	EI	C			00217	Filler Order Number +	R		

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME	OPT for ELR	RPT for ELR	ELR IMPLEMENTATION COMMENTS
4	200	CE	R			00238	Universal Service ID	R		Required for ELR
5	2	ID	X			00239	Priority	O		Not applicable to result message. Not supported.
6	26	TS	X			00240	Requested Date/Time	O		Not applicable to result message. Not supported.
7	26	TS	C			00241	Observation Date/Time #	O		This is specimen collection date/time, which is expected but will not error out the message if not received.
8	26	TS	O			00242	Observation End Date/Time #	O		Support but has not been received – not many Public Health specimens are timed.
9	20	CQ	O			00243	Collection Volume *	O		If received, it is accommodated, although it is typically not reported with the result..
10	60	XCN	O	Y		00244	Collector Identifier *	O	N	If Collector entity is received, it is created, but only one instance supported.
11	1	ID	O		0065	00245	Specimen Action Code *	O		Not applicable to result message. Not supported.
12	60	CE	O			00246	Danger Code	O		Not applicable to result message. Not supported.
13	300	ST	O			00247	Relevant Clinical Info.	O		Clinical information text - accommodated if sent.
14	26	TS	C			00248	Specimen Received Date/Time *	C		This is the time when the lab logged the specimen in.
15	300	CM	O		0070	00249	Specimen Source *	O		Specimen type/source is sometimes received and a material entity is created.
16	80	XCN	O	Y		00226	Ordering Provider	O	N	Support one instance only.
17	40	XTN	O	Y/2		00250	Order Callback Phone Number	O	N	Support one instance only.
18	60	ST	O			00251	Placer Field 1	O		Not used
19	60	ST	O			00252	Placer Field 2	O		Not used
20	60	ST	O			00253	Filler Field 1 +	O		Not used

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME	OPT for ELR	RPT for ELR	ELR IMPLEMENTATION COMMENTS
21	60	ST	O			00254	Filler Field 2 +	O		Not used
22	26	TS	C			00255	Results Rpt/Status Chng-Date/Time +	C		Often received; treated as the activity end date/time .
23	40	CM	O			00256	Charge to Practice +	O		Not used
24	10	ID	O		0074	00257	Diagnostic Serv Sect ID	O		Not used
25	1	ID	C		0123	00258	Result Status +	C		Not required for ELR but is for processing to ODS.
26	400	CM	O			00259	Parent Result +	O		Required for susceptibility results
27	200	TQ	O	Y		00221	Quantity/Timing	O	Y	Not used
28	150	XCN	O	Y/5		00260	Result Copies To	O	Y/5	Supports repeats if sent
29	200	CM	O			00261	Parent *	O		Required for susceptibility results
30	20	ID	O		0124	00262	Transportation Mode	O		Not used
31	300	CE	O	Y		00263	Reason for Study	O	Y	These are the ICD-9 codes and descriptions.
32	200	CM	O			00264	Principal Result Interpreter +	O		If sent, support one instance only.
33	200	CM	O	Y		00265	Assistant Result Interpreter +	O	Y	If sent, support one instance only.
34	200	CM	O	Y		00266	Technician +	O	Y	If sent, support one instance only.
35	200	CM	O	Y		00267	Transcriptionist +	O	Y	If sent, support one instance only.
36	26	TS	O			00268	Scheduled Date/Time +	O		Not used
37	4	NM	O			01028	Number of Sample Containers *	O		Not used
38	60	CE	O	Y		01029	Transport Logistics of Collected Sample *	O	Y	Not used
39	200	CE	O	Y		01030	Collector's Comment *	O	Y	Not used
40	60	CE	O			01031	Transport Arrangement Responsibility	O		Not used

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME	OPT for ELR	RPT for ELR	ELR IMPLEMENTATION COMMENTS
41	30	ID	O		0224	01032	Transport Arranged	O		Not used
42	1	ID	O		0225	01033	Escort Required	O		Not used
43	200	CE	O	Y		01034	Planned Patient Transport Comment	O	Y	Not used
44	80	CE	O		0088	00393	Procedure Code	O		Not used
45	80	CE	O	Y	0340	01316	Procedure Code Modifier	O	Y	Not used

For any fields not discussed in this guide see *Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol*.

OBR-1 Set ID - OBR   (SI)   00237

A sequence number used to identify the specific OBR instance in a message with multile OBR segment.

OBR-2 Placer order number (EI)   00216

                Components: <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID
                        (ST)> ^ <universal ID type (ID)>

The Placer's identifier for the observation request represented by this OBR segment. This identifier may not be known or may not exist, for example, in the case of child and other orders that originate from the Filler.

OBR-3 Filler order number (EI)   00217

                Components: <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID
                        (ST)> ^ <universal ID type (ID)>

This field is the order number associated with the specimen which has been assigned by the laboratory. The first component is a string that identifies an order received by a laboratory. This string must uniquely identify the order from other orders in the laboratory. This uniqueness must persist over time. This unique identifier is usually referred to as the "Accession Number."

The value of this field in a reflex order/observation may be different than the Filler order number of the parent order.

OBR-4 Universal service ID (CE)   00238

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)>
             ^<alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of
             alternate coding system (ST)>
```

This field is the identifier code for the requested observation/test/battery. This can be based on local and/or "universal" codes.

All results should use LOINC® codes and include the short name for the second component. As specified in *HL7 Table 0396 Name of coding systems*, LOINC® is represented in the third component with the string "LN".

OBR-15 Specimen source (CM)   00249

```
Components:  <specimen source name or code (CE)> ^ <additives (TX)> ^
             <freetext (TX)> ^ <body site (CE)> ^ <site modifier (CE)> ^
             <collection method modifier code (CE)>

Subcomponents of specimen source name or code: <identifier (ST)> & <test (ST)>
             & <name of coding system (ST)> & <alternate identifier (ST)> &
             <alternate text (ST)> & <name of alternate coding system (ST)>

Subcomponents of body site: <identifier (ST)> & <test (ST)> & <name of coding
             system (ST)> & <alternate identifier (ST)> & <alternate text (ST)>
             & <name of alternate coding system (ST)>

Subcomponents of site modifier: <identifier (ST)> & <test (ST)> & <name of
             coding system (ST)> & <alternate identifier (ST)> & <alternate text
             (ST)> & <name of alternate coding system (ST)>

Subcomponents of collection method modifier code: <identifier (ST)> & <test
             (ST)> & <name of coding system (ST)> & <alternate identifier (ST)>
             & <alternate text (ST)> & <name of alternate coding system (ST)>
```

HL7 Table 0070 Specimen Source can be used to populate the first component. A specimen source (versus site) identifier (or mnemonic) is sent in OBR 15.01.01, the full name of the source is sent in OBR 15.01.02, and the coding scheme is in OBR 15.01.03. For some HIS systems, the source name is sent again in OBR 15.02.00

Here is a sample OBR segment with the specimen source bolded:

```
OBR|1||084.00001|WC^WOUNDCULT^L|||200203250704|||USER1^User
    &User1|||||ABS&ABSCESS&HL&0070…<cr>
```

OBR-26 Parent result (CM)   00259

```
Components:  <OBX-3-observation identifier of parent result (CE)> ^ <OBX-4-
             sub-ID of parent result (ST)> ^ <part of OBX-5 observation result
             from parent (TX) see discussion>

Subcomponents of OBX-3-observation identifier or parent result: <identifier
             (ST)> & <test (ST)> & <name of coding system (ST)> & <alternate
             identifier (ST)> & <alternate text (ST)> & <name of alternate
             coding system (ST)>
```

This field defines a specific linkage for a parent/child relationship between orders. This information is used in conjunction with the information in *OBR-29-parent* to uniquely identify the parent (original culture) result's OBX segment, which the child susceptibilities are related to. The three components of OBR-26 are essentially the OBX-3, OBX-4, and part of the OBX-5 from the parent OBX segment. All three components are required.

Component one contains the code value from the parent culture's *OBX-3 Observation identifier* (OBX-3.1) which identifies the organism on which the susceptibilities were run. This will frequently by the LOINC® code 11475-1 (Microorganism Identified:).

Component two contains the value of *OBX-4 Observation Sub-ID* of parent result (e.g. 2 for the second organism, 3 for the third organism).

Component 3 contains the text description from *OBX-5-Observation Value* (OBX-5.2). It specifies the isolate (from the original parent culture) that the sensitivity results apply to. This field should only contain the text name of the isolate exactly as it appears in the culture (parent) result message and *not* the entire contents of the original culture (parent's) *OBX-5-Observation Value*.

The following example emphasizes the content of the fifth OBX that comprise the content of OBR-26 in the second OBR. This provides a pointer back to the parent OBX where the culture result is reported.

```
OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^ Spt Routine
    Cult^LN…<cr>

OBX|1||11475-1^MICROORGANISM IDENTIFIED:^LN|1| L-
    24801^Staphylococcus aureus^SNM…<cr>

OBX|2||564-5^Colony count^LN |1|10,000-90,000…<cr>

OBX|3||11475-1^MICROORGANISM IDENTIFIED:^LN|2|L-25128^Beta
    hemolytic Streptococcus A^SNM…<cr>

OBX|4||564-5^Colony count^LN |2|<1,000…<cr>

OBX|5|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|3|L-13401 ^
    Haemophilus influenzae^SNM…<cr>

OBX|6||564-5^Colony count^LN|3|10,000-90,000…<cr>

OBR|2||ABC012345^LabOne|29576-6^ Bacterial Susc Panel
    Islt^LN|…|<field-25>|11475-1^3^Haemophilus
    influenza|||0889436&GoodDr^ABC012345&LabOne…<cr>

OBX|… <cr>
```

Error!Error!   Culture (parent) Message

OBR placer order #   Univ Service ID
OBX
OBX 3 observation code, 4 subID, 5 organism name
OBX

Susceptibility (child) Message

OBR-26 Parent OBX-3, 4, 5   OBR-29 placer order #   Univ Service ID
OBX
OBX
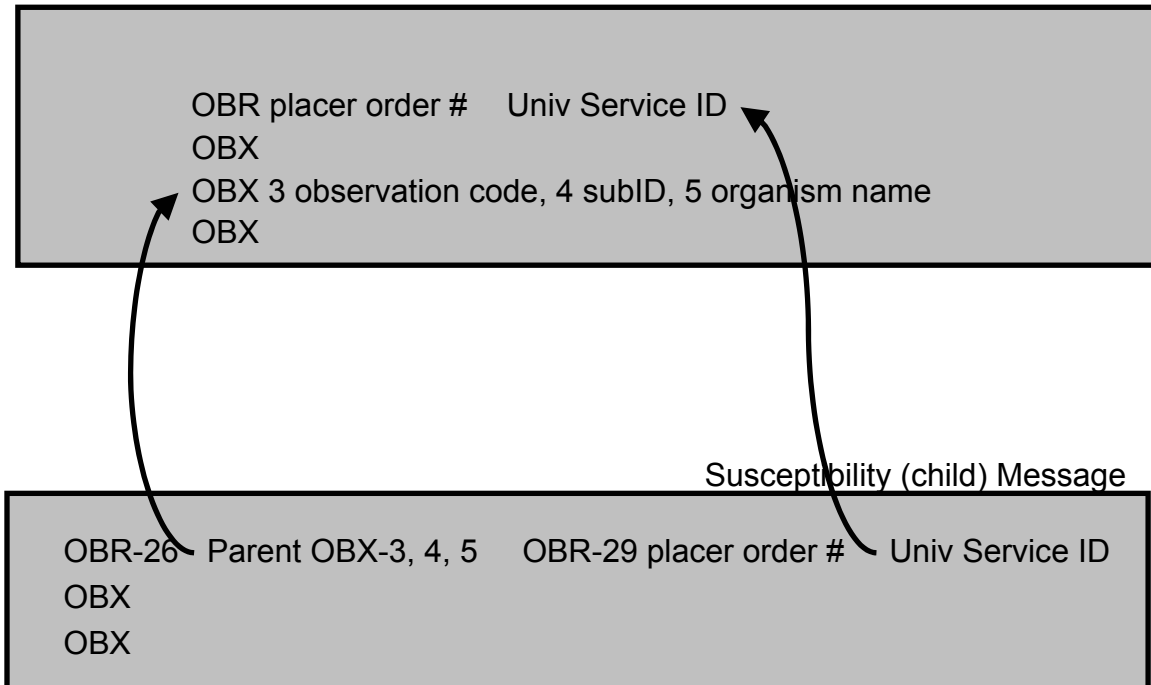
Figure 1 -- Relationship between sensitivity (child) and culture (parent) messages -- The OBR-26 and the OBR-29 contain data that allow the susceptibility message to be linked back to the culture message.

OBR-29 Parent (CM) 00261

```
Components:  <parent's placer order number (EI)> ^ <parent's filler order
         number (EI)>

Subcomponents of parent's placer order number:  <entity identifier (ST)> &
         <namespace ID (IS)> & <universal ID (ST)> & <universal ID type
         (IS)>

Subcomponents of parent's filler order number:  <entity identifier (ST)> & <
         <namespace ID (IS)> & <universal ID (ST)> & <universal ID type
         (IS)>
```

This field relates the culture (parent) message to its sensitivity (child) message. The OBR-29 contains two components – the parent placer number and the parent filler order number. The content and meaning of the parent placer and filler numbers is as described for *OBR-2 Filler order number* and *OBR-3 Filler order number*, with the exception that the component delimiters (default "^") are demoted to sub-component delimiters (default "&").

The filler order number for the sensitivity (child) and the original culture (parent) may or may not be the same. If a laboratory uses the same filler order number for the child susceptibilities as it uses for the report of the parent original culture, then the same filler order number should appear in the original culture (parent) result OBR-3 and in the susceptibility (child) report fields OBR-3 and OBR-29. If the laboratory uses different

filler order numbers for the child susceptibilities, then the field OBR-3 in the original parent culture and field OBR-29 in the child sensitivity result (child) would be the same but OBR-3 in the child sensitivity result would be different.

The following example is repeated from OBR-26, with the emphasis changed to show the relative content between the first OBR and the second OBR.

```
OBR|1|0889436^GoodDr|ABC012345^LabOne|6460-0^ Spt Routine
    Cult^LN…<cr>

OBX|1||11475-1^MICROORGANISM IDENTIFIED:^LN|1| L-
    24801^Staphylococcus aureus^SNM…<cr>

OBX|2||564-5^Colony count^LN |1|10,000-90,000…<cr>

OBX|3||11475-1^MICROORGANISM IDENTIFIED:^LN|2|L-25128^Beta
    hemolytic Streptococcus A^SNM…<cr>

OBX|4||564-5^Colony count^LN |2|<1,000…<cr>

OBX|5|CE|11475-1^MICROORGANISM IDENTIFIED:^LN|3|L-13401 ^
    Haemophilus influenzae^SNM…<cr>

OBX|6||564-5^Colony count^LN|3|10,000-90,000…<cr>

OBR|2||ABC012345^LabOne|29576-6^ Bacterial Susc Panel
    Islt^LN|…|<field-25>|11475-1^3^Haemophilus
    influenza|||0889436&GoodDr^ABC012345&LabOne…<cr>

    …
```

OBX – Observation Result Segment

The OBX segment is used to transmit a single observation or observation fragment. It represents the smallest indivisible unit of a report. Its principal mission is to carry information about observations in report messages. While OBR gives general information about the order for the test and ORC gives information on all services that are requested, the OBX segment gives the specific, individual tests performed (OBX-3) and the specific results for each test (OBX-5). **Laboratory-based reporting to public health agencies focuses on OBX-3 and OBX-5 as the most informative elements of the message; thus, every effort should be made to make OBX-3 and OBX-5 as informative and unambiguous as possible.**

OBX – Observation/Report Segment Attributes

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME	OPT for ELR	RPT for ELR	ELR IMPLEMENTATION COMMENTS
1	4	SI	O			00569	Set ID-OBX	O		Required for ELR
2	3	ID	C		0125	00570	Value type	C		Required if OBX-5 is not null (as it could be when the interpretation in OBX-8 is the only result)

3	80	CE	R			00571	Observation identifier	R		Required for ELR. For laboratory-based reporting, LOINC® is strongly recommended for OBX-3 when results are coded and CE data types are used.
4	20	ST	C			00572	Observation sub-ID	C		Required for ELR
5	65536	varies	C	Y		00573	Observation value	C	N	The data type and length for OBX-5 can vary and are determined by OBX-2. Can be omitted when the interpretation sent in OBX-8 carries the full result. For laboratory-based reporting, SNOMED® is strongly recommended for OBX-5 when results are coded and CE data types are used.
6	60	CE	O			00574	Units	O		Required for numeric results
7	60	ST	O			00575	Reference ranges	O		Optional for ELR
8	5	ID	O	Y/5	0078	00576	Abnormal flags	O	N	Optional for ELR – repeats not supported.
9	5	NM	O			00577	Probability	O		
10	2	ID	O	Y	0080	00578	Nature of abnormal test	O		
11	1	ID	R		0085	00579	Observation result status	R		
12	26	TS	O			00580	Date last Obs normal values	O		
13	20	ST	O			00581	User defined access checks	O		
14	26	TS	O			00582	Date/time of the observation	O		Used for ELR as the activity end time for the observation.
15	60	CE	O			00583	Producer's ID	O		Expecting this to be a lab identifier only for ELR – do not support person id sent in this field.
16	80	XCN	O	Y		00584	Responsible observer	O	N	
17	60	CE	O	Y		00936	Observation method	O	N	Optional: not supporting repeats.

OBX-1 Set ID - OBX (SI)   00569

This field contains the sequence numbers which individual OBX segments when multiple OBX segments exist in a message.

OBX-2 Value type (ID)   00570

This field specifies the data type for OBX-5 (Observation value). It indicates how an observation value is formatted. In the context of this guide, the most comment entries in the field will be "CE" (coded element), "SN" (structured numeric), and "TX" (text).

OBX-3 Observation identifier (CE)   00571

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^
             <alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of
             alternate coding system (ST)>
```

This field contains a unique identifier for the observation or test performed.   The CE data type allows for the sending of both a universal identifier as well as a local code for the same observation. For public health reporting, LOINC® codes are be used as the universal identifier. For consistency within the context of this guide, the first triplet of components are used for the universal identifier (LOINC®), and the second triple would be used for a local code, if desired. In most systems the identifier will point to a master observation table that will provide other attributes of the observation that may be used by the receiving system to process the observations it receives. A set of message segments for transmitting such master observation tables is described in Chapter 8 of the HL7 Standard Version 2.3.1.

- Parent Culture OBX field 3 (observation ID) *must* be the same for all isolated microorganisms identified within a culture battery (HL7 v2.3 section 7.4.5.1 paragraph 3). The first component is required in order to support parent-child linking (the parent OBX-3.1 is used in the child OBR-26.1 as part of the parent-child link).

- Child Susceptibility OBX-3 field contains the identifier for the antibiotic being tested.

OBX-4 Observation sub-ID (ST)   00572

For Microbiology reporting, this field is used to group related OBX segments relative to isolates identified in a parent culture report..

- Parent's Culture Result *OBX-4 Observation sub-ID* is unique and required for microbiology reporting. The sub-identifier is used to group related observations

in reports such as susceptibility results to a specific organism identified in the parent culture OBXs.

- Child Susceptibility Result OBX-4 (observation sub-ID) is valued with the same sub-ID of its parent isolate. For the child susceptibility report, the value from the parent's OBX-3 field is also used in OBR-26, as the value for the second component (which relates the Sub-Id of a specific parent culture isolate result).

OBX-5 Observation value (varies)   00573

This field contains the actual value observed by the observation producer. For cultures and susceptibility reporting, it could be a coded result or a numeric result (depending on susceptibility method). A more detailed discussion of OBX-5 is found in the HL7 Standard Version 2.3.1 and in the *Implementation Guide for Transmission of Laboratory-Based Reporting of Public Health Reporting Information using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol*.

- In culture reports, *OBX-5 Observation value* may contain the organism name, colony counts and/or other observations as defined by *OBX-3 Observation identifier*. OBX-5.2 may also be employed in a subsequent OBR segment (OBR-26.3) as part of the parent-child observation linkage.

- In susceptibility reports, *OBX-5 Observation value* contains the susceptibility value for the antibiotic/method

For public health laboratory-based reporting and in the context of this guide, SNOMED (http://www.snomed.org) is the preferred coding system for OBX-5 whenever the CE data type is indicated in OBX-2. For instance, OBX-5 may have the SNOMED code for "positive" or the SNOMED-specific names of organisms identified in the tests described in OBX-3. It is strongly recommended that SNOMED be used for the modifiers "positive", "negative", and "indeterminate". Other modifiers should be avoided such as "limited findings", "insufficient specimen", "patient not at bedside", or "see technician".

For numeric results, the SN (Structured Numeric) data type is preferred (*i.e.*, OBX-2 valued with "SN" and OBX-5 formatted as a SN data type). The SN data type has the following structure:

```
<comparator> ^ <num1(NM)> ^ <separator or suffix> ^ <num2 (NM)>
```

Some examples of the SN data type representation are:

```
|>^100|        greater than 100
|^100^-^200|   equal to range of 100 through 200
```

```
|^1^:^228|      ratio of 1 to 128 (e.g., the results of a
                serological test)

|^2^+|          categorical response (e.g., an
                interpretation of occult blood positivity)
```

It is strongly recommended that the data types CE and SN be used whenever possible to minimize ambiguity in reporting. For example, in antimicrobial susceptibility testing with a numeric result, the OBX segment would appear as:

```
OBX|1|SN|7059-9^Vancomycin Susceptibility, Gradient
    Strip^LN||<^1|…<cr>
```

An example with a coded result, a culture which yielded Neisseria meningitidis would be reported in an OBX similar to:

```
OBX|1|CE|10352-3^MICROORGANISM IDENTIFIED:^LN|1|L-
    22202^Neisseria meningitidis^SNM|…<cr>
```

OBX-8 Abnormal flags (ID)   00576

Definition: This field contains the abnormal flags. Abnormal flags should be used for reporting microbiology sensitivity data. Microbiology sensitivity interpretations should appear as listed in *User-defined table 0078 - Abnormal flags*. For most reported findings, the allowable values are S, R, or I and should be provided in OBX-8 in addition to the numeric value in OBX-5.

OBR-11 Observation result status (ID)   00579

Definition: This *required* field contains the observation result status. Refer to *HL7 table 0085* - Observation *result status codes interpretation* for valid values. This field reflects the current completion status of the results for one Observation Identifier.

Note that PHIN only recognizes a subset of the values in *HL7 table 0085* - Observation *result status codes interpretation*. The values are emphasized in the table and list here:

- C   Record coming over is a correction and thus replaces a final result

- F   Final results; Can only be changed with a corrected result.

- P   Preliminary results

- D   Deletes the OBX record

OBX-17 Observation method (CE) 00936

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^
             <alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of
             alternate coding system (ST)>
```

This optional field contains the method used to determine sensitivities (e.g., Kirby Bauer, minimum inhibitory concentration (MIC), etc.). The Centers for Disease Control and Prevention (CDC) Method Code (CDCM from Figure 7.3 in HL7 V 2.3.1) is one candidate code system for reporting methods/instruments.   For antimicrobial susceptibility testing, the antimicrobial test for which MICs (minimum inhibitory concentrations) have been performed may appear as:

```
|524-9^Vancomycin Susceptibility MIC^LN|
```

where "524-9" is the LOINC® code for the vancomycin MIC test, "Vancomycin Susceptibility MIC" is a text description and "LN" represents the name of the coding system. Identification of the method as broth dilution may appear in *OBX-17*.

Appendix A - Members of the CDC eHealth Initiative Public Private Collaboration Working Group on Microbiology Results

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Appendix B - Tables

HL7 Table 0121 - Response flag

Value	Description
E	Report exceptions only
R	Same as E, also Replacement and Parent-Child
D	Same as R, also other associated segments
F	Same as D, plus confirmations explicitly
N	Only the MSA segment is returned

HL7 Table 0074 - Diagnostic service section ID

Value	Description
AU	Audiology
BG	Blood gases
BLB	Blood bank
CUS	Cardiac Ultrasound
CTH	Cardiac catheterization
CT	CAT scan
CH	Chemistry
CP	Cytopathology
EC	Electrocardiac (e.g., EKG, EEC, Holter)
EN	Electroneuro (EEG, EMG,EP,PSG)
HM	Hematology
ICU	Bedside ICU Monitoring
IMG	Diagnostic Imaging

Value	Description
IMM	Immunology
LAB	Laboratory
MB	Microbiology
MCB	Mycobacteriology
MYC	Mycology
NMS	Nuclear medicine scan
NMR	Nuclear magnetic resonance
NRS	Nursing service measures
OUS	OB Ultrasound
OT	Occupational Therapy
OTH	Other
OSL	Outside Lab
PAR	Parasitology
PAT	Pathology (gross & histopath, not surgical)
PHR	Pharmacy
PT	Physical Therapy
PHY	Physician (Hx. Dx, admission note, etc.)
PF	Pulmonary function
RAD	Radiology
RX	Radiograph
RUS	Radiology ultrasound
RC	Respiratory Care (therapy)
RT	Radiation therapy

Value	Description
SR	Serology
SP	Surgical Pathology
TX	Toxicology
URN	Urinalysis
VUS	Vascular Ultrasound
VR	Virology
XRC	Cineradiograph

HL7 Table 0123 - Result status

Value	Description
O	Order received; specimen not yet received
I	No results available; specimen received, procedure incomplete
S	No results available; procedure scheduled, but not done
A	Some, but not all, results available
P	Preliminary: A verified early result is available, final results not yet obtained
C	Correction to results
R	Results stored; not yet verified
F	Final results; results stored and verified. Can only be changed with a corrected result.
X	No results available; Order canceled.
Y	No order on record for this test. (Used only on queries)
Z	No record of this patient. (Used only on queries)

User-defined Table 0411 - Supplemental service information values

Value	Description
1ST	First

Value	Description
2ND	Second
3RD	Third
4TH	Fourth
5TH	Fifth
ANT	Anterior
A/P	Anterior/Posterior
BLT	Bilateral
DEC	Decubitus
DST	Distal
LAT	Lateral
LFT	Left
LLQ	Left Lower Quadrant
LOW	Lower
LUQ	Left Upper Quadrant
MED	Medial
OR	Operating Room
PED	Pediatric
POS	Posterior
PRT	Portable
PRX	Proximal
REC	Recumbent
RLQ	Right Lower Quadrant
RGH	Right

Value	Description
RUQ	Right Upper Quadrant
UPP	Upper
UPR	Upright
WCT	With Contrast
WOC	Without Contrast
WSD	With Sedation

HL7 Table 0125 - Value type

Value	Description
AD	Address
CE	Coded Entry
CF	Coded Element With Formatted Values
CK	Composite ID With Check Digit
CN	Composite ID And Name
CP	Composite Price
CX	Extended Composite ID With Check Digit
DT	Date
ED	Encapsulated Data
FT	Formatted Text (Display)
MO	Money
NM	Numeric
PN	Person Name
RP	Reference Pointer
SN	Structured Numeric

Value	Description
ST	String Data.
TM	Time
TN	Telephone Number
TS	Time Stamp (Date & Time)
TX	Text Data (Display)
XAD	Extended Address
XCN	Extended Composite Name And Number For Persons
XON	Extended Composite Name And Number For Organizations
XPN	Extended Person Name
XTN	Extended Telecommunications Number

User-defined Table 0078 - Abnormal flags

Value	Description
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

Value	Description
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.

HL7 Table 0080 - Nature of abnormal testing

Value	Description
A	An age-based population
N	None - generic normal range
R	A race-based population
S	A sex-based population

HL7 Table 0085 - Observation result status codes interpretation

Value	Description
C	Record coming over is a correction and thus replaces a final result
D	Deletes the OBX record
F	Final results; Can only be changed with a corrected result.
I	Specimen in lab; results pending
N	Not asked; used to affirmatively document that the observation identified in the OBX was not sought when the universal service ID in OBR-4 implies that it would be sought.
O	Order detail description only (no result)
P	Preliminary results

Value	Description
R	Results entered -- not verified
S	Partial results
X	Results cannot be obtained for this observation
U	Results status change to final without retransmitting results already sent as 'preliminary.' E.g., radiology changes status from preliminary to final
W	Post original as wrong, e.g., transmitted for wrong patient

Note: Only the codes that are shown in bold are recognized by the PHIN.

HL7 Table 0163 - Body site

Value	Description
BE	Bilateral Ears
OU	Bilateral Eyes
BN	Bilateral Nares
BU	Buttock
CT	Chest Tube
LA	Left Arm
LAC	Left Anterior Chest
LACF	Left Antecubital Fossa
LD	Left Deltoid
LE	Left Ear
LEJ	Left External Jugular
OS	Left Eye
LF	Left Foot
LG	Left Gluteus Medius

Value	Description
LH	Left Hand
LIJ	Left Internal Jugular
LLAQ	Left Lower Abd Quadrant
LLFA	Left Lower Forearm
LMFA	Left Mid Forearm
LN	Left Naris
LPC	Left Posterior Chest
LSC	Left Subclavian
LT	Left Thigh
LUA	Left Upper Arm
LUAQ	Left Upper Abd Quadrant
LUFA	Left Upper Forearm
LVG	Left Ventragluteal
LVL	Left Vastus Lateralis
NB	Nebulized
PA	Perianal
PERIN	Perineal
RA	Right Arm
RAC	Right Anterior Chest
RACF	Right Antecubital Fossa
RD	Right Deltoid
RE	Right Ear
REJ	Right External Jugular

Value	Description
OD	Right Eye
RF	Right Foot
RG	Right Gluteus Medius
RH	Right Hand
RIJ	Right Internal Jugular
RLAQ	Rt Lower Abd Quadrant
RLFA	Right Lower Forearm
RMFA	Right Mid Forearm
RN	Right Naris
RPC	Right Posterior Chest
RSC	Right Subclavian
RT	Right Thigh
RUA	Right Upper Arm
RUAQ	Right Upper Abd Quadrant
RUFA	Right Upper Forearm
RVL	Right Vastus Lateralis
RVG	Right Ventragluteal

HL7 Table 0070 - Specimen source codes

Value	Description
ABS	Abscess
AMN	Amniotic fluid
ASP	Aspirate
BPH	Basophils

Value	Description
BIFL	Bile fluid
BLDA	Blood arterial
BBL	Blood bag
BLDC	Blood capillary
BPU	Blood product unit
BLDV	Blood venous
BON	Bone
BRTH	Breath (use EXHLD)
BRO	Bronchial
BRN	Burn
CALC	Calculus (=Stone)
CDM	Cardiac muscle
CNL	Cannula
CTP	Catheter tip
CSF	Cerebral spinal fluid
CVM	Cervical mucus
CVX	Cervix
COL	Colostrum
BLDCO	Cord blood
CNJT	Conjunctiva
CUR	Curettage
CYST	Cyst
DIAF	Dialysis fluid

Value	Description
DOSE	Dose med or substance
DRN	Drain
DUFL	Duodenal fluid
EAR	Ear
EARW	Ear wax (cerumen)
ELT	Electrode
ENDC	Endocardium
ENDM	Endometrium
EOS	Eosinophils
RBC	Erythrocytes
EYE	Eye
EXG	Exhaled gas (=breath)
FIB	Fibroblasts
FLT	Filter
FIST	Fistula
FLU	Body fluid, unsp
GAS	Gas
GAST	Gastric fluid/contents
GEN	Genital
GENC	Genital cervix
GENL	Genital lochia
GENV	Genital vaginal
HAR	Hair

Value	Description
IHG	Inhaled Gas
IT	Intubation tube
ISLT	Isolate
LAM	Lamella
WBC	Leukocytes
LN	Line
LNA	Line arterial
LNV	Line venous
LIQ	Liquid NOS
LYM	Lymphocytes
MAC	Macrophages
MAR	Marrow
MEC	Meconium
MBLD	Menstrual blood
MLK	Milk
MILK	Breast milk
NAIL	Nail
NOS	Nose (nasal passage)
ORH	Other
PAFL	Pancreatic fluid
PAT	Patient
PRT	Peritoneal fluid /ascites
PLC	Placenta

Value	Description
PLAS	Plasma
PLB	Plasma bag
PLR	Pleural fluid (thoracentesis fld)
PMN	Polymorphonuclear neutrophils
PPP	Platelet poor plasma
PRP	Platelet rich plasma
PUS	Pus
RT	Route of medicine
SAL	Saliva
SMN	Seminal fluid
SER	Serum
SKN	Skin
SKM	Skeletal muscle
SPRM	Spermatozoa
SPT	Sputum
SPTC	Sputum - coughed
SPTT	Sputum - tracheal aspirate
STON	Stone (use CALC)
STL	Stool = Fecal
SWT	Sweat
SNV	Synovial fluid (Joint fluid)
TEAR	Tears
THRT	Throat

Value	Description
THRB	Thrombocyte (platelet)
TISS	Tissue
TISG	Tissue gall bladder
TLGI	Tissue large intestine
TLNG	Tissue lung
TISPL	Tissue placenta
TSMI	Tissue small intestine
TISU	Tissue ulcer
TUB	Tube NOS
ULC	Ulcer
UMB	Umbilical blood
UMED	Unknown medicine
URTH	Urethra
UR	Urine
URC	Urine clean catch
URT	Urine catheter
URNS	Urine sediment
USUB	Unknown substance
VITF	Vitreous Fluid
VOM	Vomitus
BLD	Whole blood
BDY	Whole body
WAT	Water

Value	Description
WICK	Wick
WND	Wound
WNDA	Wound abscess
WNDE	Wound exudate
WNDD	Wound drainage
XXX	To be specified in another part of the message